Changes in Ottoman educational life and efforts towards modernization in the 18th–19th centuries

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The *medreses* were without doubt the key institutions of learning and education in the Ottoman Empire. Although the medrese system was inherited from the Seljukid Turks, it underwent some changes in the Ottoman epoch, particularly with regard to organization. The first Ottoman medrese was established by Orhan Gazi in 1331. The number of medreses increased rapidly during the following years: by the end of the 16th century 350 medreses had been founded by the Ottomans, most of them in Anatolia, Istanbul, and Rumelia.

The strengthening of central authority, particularly during the reign of Sultan Mehmed II the Conqueror (1451–1481), affected the evolution of education and science. With political stability and economic prosperity, distinguished scholars and artists from throughout the Islamic world gathered in the imperial capital. The endowments, which became increasingly large, had a great impact on the development of scholarly and educational life.[1]

For many centuries, prior to the modernizing reforms which began at the end of the 18th century, it was in these medreses that the required personnel in religious, legal and scientific affairs were trained. These traditional institutions were financially independent of the state, because endowments, or *waqfs*, provided their financial needs. Officials who graduated from the medrese, such as the *imam, vaiz, hoca, müderris, kadı, müftü, kadıasker, şeyhülislam* (prayer leader, preacher, teacher, professor, judge, jurisconsult, chief military judge, the head of the hierarchy of *ulema*) were called *ilmiye ricali* (ulema class). As religious figures and representatives of official state policy and ideology, this class was influential. For this reason, the medreses were important for the state, which avoided any interference in their operation. However, the main objective of the medreses and medrese education was to train "educated believers", versed in the classical Islamic religious sciences, who would defend Islam against its intellectual opponents.

The sciences taught in the medreses were divided into two parts, namely the "high sciences" and the "ancillary sciences". The high sciences included Koranic

commentary, Prophetic traditions, and Muslim canonical jurisprudence. Ancillary sciences comprised grammar and syntax, rhetoric, logic, Islamic theology, arithmetic, geometry, astronomy, and philosophy.

Technical training was given both in the *ocaks* (corps of the Ottoman army) and the *enderun*, the palace school, and the technical education given by these two institutions allowed Ottomans to maintain their military superiority throughout the 14th–17th centuries. However, defeats by the European armies in the beginning of the 18th century showed clearly that the balance of military power had turned against them. Consequently, Ottomans became more interested in European military and technological innovations than they had been in the previous centuries. To regain parity with Europe, they established schools, which offered up-to-date technical education in tactics and weaponry. These represented a major departure from traditional training of the barracks, which was based on master-apprentice relationships. These efforts initiated significant changes and developments in the Ottoman educational system.[2]

Emergence of new educational institutions and the Westernization of education

The first Ottoman institution to give modern military technical training was the *Humbaracı Ocağı* (The Corps of Bombardiers). This corps was reorganised in 1735, owing to the efforts of the renowned general of French origin, Claude Alexander Comte de Bonneval (1674–1747), who took shelter with the Ottomans in 1729, embraced Islam and assumed the name Ahmed. The fact that he took refuge in Istanbul helped the Ottomans in their attempts towards military renewal.[3]

The ocak (corps) was divided into three subdivisions or *oda*, and about 25 officers of different ranks and salaries were allocated to and trained in each subdivision. Some of these officers had administrative responsibilities, while others handled military, educational, and medical affairs.

This corps was under the direct supervision of the Commander-in-chief and the Grand Vizier. Whereas the salary of the Ottoman military was traditionally provided by the treasury, the salaries of the officers and soldiers of the new bombardiers corps were paid from a special fund. Furthermore, a candidacy system was introduced, whereby salaries were fixed according to each rank. The retirement pension of the bombardiers was also guaranteed.

The curriculum and the teaching staff of the corps is not known exactly. However, records indicate that Ottoman, as well French and Scottish teachers participated in instruction. Mehmet Said Efendi was the instructor in geometry, Istanbullu Ibrahim Hodja taught arithmetic, geometry, drawing and the

measurement of altitude, while Cenk Mimarbaşı Selim Ağa taught fortification, artillery, and mechanics. Classical Ottoman mathematical works and European texts were used concurrently. With the establishment of the Corps of Bombardiers, where mathematical sciences were taught theoretically, a new system of training entered Ottoman education. Before the Corps was founded, training in mathematical sciences depended on either the medreses or lessons from private teachers. The military schools opened up a third venue.

After Bonneval Ahmed Pasha's death in 1747, the corps of bombardiers was administered by his adoptive son Süleyman Ağa, and then soon dissolved. However, the Ottoman administrators' primary objective was the training of army officers, and this goal resurfaced in the military schools established in the 1770s.[4]

Towards the Imperial School of Military Engineering

The creation of the *Hendesehane* in the Imperial Maritime Arsenal on April 29, 1775 under the supervision of Baron de Tott represented a significant step forward in Ottoman military education. The goal of Hendesehane was to provide the imperial fleet (*Donanma–i Humayun*) with officers trained in the sciences, particularly geometry and geography. The Hendesehane (literally, Chamber of Geometry) is referred to as the Ecole de Théorie et de Mathématiques in French documents. It taught military technical subjects to a select group of students and differed from the earlier Corps of Bombardiers, whose aim was job training. The Hendesehane represented an unprecedented innovation. The French technician Kermovan and the Scottsman Campbell Mustafa taught mathematics in the Hendesehane until September 1775, when Kermovan left Istanbul and Baron de Tott lost interest in this subject.[5]

With a regulation dated 1776, it became the first Ottoman institution where mathematics and fortification were taught based on European sources, theories, and methods. After Baron de Tott left Istanbul in 1776, Cezayirli Seyyid Hasan, the Second Captain in the imperial fleet, was appointed *hodja* (professor) in the Hendesehane. Soon, this institution which was established under the administration of European specialists, was reorganized to conform to the traditional Ottoman bureaucratic structure.

After 1781, the Hendesehane was also called *Mühendishane* (literally Chamber of Engineers) and the training was carried on with ten students. During the Grand Vizier Halil Hamid Pasha's term of office (1782–1785), the military engineers Lafitte–Clavé and Monnier, sent by the French government to help reform the Ottoman army and strengthen fortifications, also taught in the Mühendishane and trained officers in artillery, navigation, and fortification.

As in the case of the Corps of Bombardiers (1735), Ottoman teachers graduated from medreses (ulema class) and foreign experts instructed the students in modern sciences and the military arts. Until the end of the 18th century, besides the classical Ottoman books on science, foreign texts (mainly from France) were also used, particularly in the teaching of mathematics, astronomy, firearms, techniques of fortification, warfare, and navigation. After 1788, when the Frenchmen left the Empire, all the courses in the Muhendishane were given by native medrese teachers.[6]

Within the framework of military reforms undertaken by Sultan Selim III (reign: 1789–1807) a new Mühendishane (*Mühendishane–i Cedide*) was established in 1793 to train canoniers, bombardiers, and miners. This institution constitutes the core of what would later be the *Mühendishane–i Berri–i Hümayun* (Imperial School of Military Engineering).

Courses started in the new Mühendishane in 1794 with the new generation of Ottoman engineer–teachers, who had already taught fortification in the previous Mühendishane of the Imperial Maritime Arsenal in 1784. They had also studied with French engineers such as Lafitte–Clavé and Monnier. The organization of this institution was modeled on the other Muhendishane: the teaching staff consisted of a professor (*hodja*), four assistants professors (*halife*s), and other functionaries. They taught all the members of the Corps of Bombardiers and Miners, and their subjects included geometry, trigonometry, altitude measurement, and surveying.[7]

In 1793, work was also undertaken to establish a school of naval engineering. Admiral Küçük Hüseyin Paşa set out to transform the first Mühendishane, located in the Imperial Arsenal, into a school where shipbuilding, surveying, and geography would be taught. The French naval engineer J. Balthasar Le Brun was put in charge of the school's administration. In 1797, shipbuilding and navigation sections were also set up. After Le Brun left for France, he was succeeded by the Ottoman naval officers whom he had trained.[8]

Between the years 1801–1802, a number of students selected from the corps of bombardiers, sappers, miners, and architects were admitted to the Mühendishane–i Cedide in order to be trained as engineers. About hundred students were trained by a teaching staff composed of a professor and five assistant professors. Upon a directive from the Sultan Selim III, a new regulation was made for this institution in 1806, and it was called *Mühendishane–i Berri–i Hümayun* (Imperial School of Military Engineering). This regulation carried both European and Ottoman imprints. The European practice of four classes with four teachers was introduced for the first time in the Ottoman education. Moving up from one class to the next was made according to an old Ottoman

administrative tradition. Accordingly, passing to senior classes was only possible if there was a vacancy. This way of progressing through classes was called a *silsile* (literally chain).[9]

The first *başhoca* (chief instructor) of the Imperial School of Military Engineering) was Hüseyin Rıfkı Tamanî (d. 1817). The books he translated and adapted from European sources were used as basic textbooks in the imperial schools of military and naval engineering and in other military schools.[10] Ishak Efendi, appointed chief instructor of the school in 1830, successfully improved and modernized the educational system. He mainly gained prominence by starting a broad movement to translate European books on science and technology into Turkish. Between 1826 and 1834, he published a total of 10 books in 13 volumes. Furthermore, the terminology he created contributed greatly to the development of Turkish as a scientific language.[11]

The new military schools of the 19th century

The Imperial School of Medical Sciences

Until the beginning of the 19th century the *Süleymaniye Tıp Medresesi* (Süleymaniye Medrese of Medicine) founded by Suleiman the Magnificent (1512–1566), had been the only medrese devoted to medical education. This doesn't mean that it was the sole Ottoman institution that trained physicians. Many doctors were trained in the hospitals called *Darüşşifa*. Furthermore, there were non-Muslim Ottomans who had studied medicine in Europe as well as Jewish doctors who took refuge in the Ottoman Empire. The *Tophane-i Amire* (Imperial Gun Foundry), *Tersane-i Amire* (Imperial Maritime Arsenal) and all other military organizations had their private physicians and surgeons. Although we know little about Ottoman medical training, we believe that it was based on a master-apprentice tradition.

In order to train physicians and surgeons for the Imperial Maritime Arsenal, a school called the Tersane School of Medicine was opened in January 1806. It also aimed at teaching modern medicine, diffusing medical education, and increasing the number of Muslim physicians in the Empire. The courses were to be given in French or in Italian—which were then the languages used among physicians and pharmacists in contact with Europe—and based on European textbooks.[12] Although the school was closed down in 1808, its establishment within the Imperial Maritime Arsenal points to the threefold influence of this institution in Ottoman modernization. First, the building of ships after modern technologies started in this arsenal; second, the teaching of mathematics, astronomy, and later engineering started in the Hendesehane and Mühendishane, and both were schools located in the arsenal; and third, the

introduction of modern medicine also began in this institution.

In the beginning of the 19th century, two personalities were influential in shaping Ottoman medical education. The first was Şanizade Mehmed Ataullah Efendi (d. 1826), multifaceted scholar and a full-fledged encyclopedist knowledgeable in European languages and sciences. In his well-known five volume medical work entitled *Hamse-i Şanizade*, he presented the findings of modern medicine and European anatomical knowledge for Ottoman readers.[13] The second figure was Mustafa Behçet Efendi (d. 1834), founder of modern medical education in Turkey. The *Tıphane-i Amire* (Imperial Medical School) was founded in 1827 while Behçet Efendi held the post of Imperial Chief Physician. The objective of this new medical school was also to train physicians and surgeons for the army. In January 9, 1832, a separate school for training surgeons, the *Cerrahhane-i Amire* (Imperial School of Surgery) opened at the Gülhane Gardens, annexed to the Sultan's Palace at Topkapı. In 1836, the medical school was transferred next to the school of surgery and education was rearranged under the direction of the French surgeon Sat de Gallière.[14] In 1838, these two schools were reorganized in a single institution called *Mekteb-i Tıbbiye-i Adliye-i Şahane*, the Imperial School for Medical Sciences and moved into a building in the Galatasaray district. C. Ambroise Bernard, a young doctor from Austria, was appointed director of the school that same year.

With Dr. Bernard, a new period started in Ottoman medical education both in terms of content and method. French became the teaching language. The practice of passing to senior classes depending on vacancy was abolished, and the period of instruction was fixed at five years. Graduates received a corporate diploma bearing the name of the institution. This practice, imported from Europe, was also adopted in the Imperial School of Military Engineering. Previously, in the classical period, a student was given an *icazet* (license) by his master, a personal authority in the line of the transmission of knowledge passing through the master down to the Prophet himself, the first source of knowledge.

Following the proclamation of the Imperial Rescript of *Tanzimat* in 1839, non-Muslim subjects also began to enroll in the Imperial School of Medicine. Gradually the number of Muslim students declined and the non-Muslim students who, because of their upbringing, were more successful in learning French, increased in number. Cemaleddin Efendi, the superintendent of the Imperial School of Medical Sciences, set up a special class called *mümtaz sınıf* where special emphasis was put on the teaching of Turkish, Arabic, and Persian. This class became the nucleus of the civilian school of medicine founded in 1867. The formation of this class also paved the way for the spread of modern civilian medical education among the Ottomans. Under the leadership of Kırımlı Aziz

Bey and his colleagues, who were graduates from this special class, the *Mekteb–i Tıbbiye–i Mülkiye* (Civilian School of Medical Sciences) was opened as a part of the Imperial School of Medical Sciences. Instruction was conducted in Turkish. Civilian medical education thus became an independent institution. In 1870, medicine started to be taught in Turkish in the Imperial School of Medical Sciences according to a decision by the *Darüşşura–i Askeri* (Council of the Ministry of War). This decision raised violent debates between Turkish medical doctors and their non–Muslim Francophone colleagues. After the victory of Turkish doctors, medicine in the Empire was taught exclusively in Turkish.[15]

As the number of students grew in the civilian school of medicine, the school moved to larger buildings in 1873 and 1883. In 1909, the military and the civilian schools of medicine were placed in one new and large building in the Haydarpaşa quarter of Istanbul. In 1915, the civilian school of medicine was attached to the *Dârulfünûn* (University) as the Faculty of Medicine, where it remains today. This school became the fountainhead of the Turkish medical faculties which were established later.

The Imperial School of Military Arts

In 1826, Sultan Mahmud II (reign : 1808–1839) abolished the Janissary Corps, one of the cornerstones of the Ottoman army, and formed a new corps called *Asakir–i Mansure–i Muhammediye* (literally, Mohammad's victorious soldiers). In 1831, plans were drawn up for a military school to train officers for this new force and educate them about modern techniques of warfare. Until then, officers had been trained in the Imperial School of Military Engineering.

The Ottomans envisaged a school on the model of the French Ecole Militaire. Having a capacity of 400 students, the school opened its doors in 1834 under the name of *Mekteb–i Harbiye–I Sahane* (Imperial School of Military Arts).[16] Its organization differed from the schools of engineering and medicine, and consisted of eight classes where different courses could be held separately and independently.[17] Teachers from both schools of military and naval engineering collaborated in preparing the curriculum, and raised the level of education. Moreover, students and officers were sent to Vienna and Paris to meet the need for teachers.[18]

In 1838, Emin Pasha was appointed superintendent to the school which he divided into two parts : a senior level called *Mekteb–i Fünûn–i Harbiye* (School of Military Arts), with a four–year program of training ; and a three–year junior level called *Mekteb–i Fünûn–i İdadiye* (Preparatory School for of Military Arts).[19] During Emin Pasha's tenure, the teaching staff grew, and education was modernized by a combination of European teachers and young Ottoman officers

educated in Europe. In 1848, Kimyager Derviş Pasha, the superintendent of the school, prepared regulations inspired by those of the French Ecole de Saint-Cyr. These regulations reorganized the Imperial School of Military Arts completely according to European model.[20] A veterinary school (*Baytar Mektebi*) to meet the army's need for veterinarians was establised in 1846, as part of the Imperial School of Military Arts.[21]

The emergence of civilian training institutions in Ottoman educational life

The Tanzimat Firman (Imperial Rescript of Tanzimat) proclaimed on November 3, 1839 announced that new measures would: guarantee the life, security, honor, and property of subjects regardless of their religion; establish a regular system to assess and levy taxes; develop new methods to assure a fair system of conscription; train and maintain the soldiers of the sultan's armed forces. The aim of the Tanzimat was "not only the welfare of the religion and the state, but also the prosperity of property and the nation." The essence of the state lies in the principle that "people do not exist for the state, but the state exists for the people." [22]

The Imperial Rescript of Tanzimat did not stipulate any objectives about education and science. However, it soon became clear that the reforms required a new system of education in order to bear fruit. In January 1845, when Sultan Abdülmecid visited the *Meclis-i Vâlâ* (Supreme Council of Judicial Ordinances), he pointed out the need to fight against ignorance in all aspects of life, both to achieve national welfare, and to assure the prosperity of the people. He ordered that people should be educated, and for the first time in Ottoman history the state considered the question of "carrying out the education of people" as a matter of official state policy and responsibility.

The *Meclis-i Muvakkat* (Temporary Council), which consisted of members from the ulema, bureaucracy and the military, began to work on March 13, 1845 to organize education. The members of this Council were charged with laying down the basic principles and plans related to the new education policies. Members educated in the classical Ottoman medrese, and those supporters of Western style innovation like General Mehmed Emin Paşa, who were educated in Europe, tried to cooperate in preparing the educational reform.

After functioning for a year, the Temporary Council submitted a report to the Supreme Council of Judicial Ordinances. The report proposed the re-organization of elementary (*iptidai*) and secondary schools (*rüşdiye*), and the establishment of an institution by the name of Dâarulfünûn (a term which would later be used to render the European notion of university) where arts and sciences would be taught. The Temporary Council accepted the *rüşdiyes* as

secondary schools which prepared students for the Dârulfünûn, thus fixing their place in the Ottoman educational system. As the training in the first *rüşdiyes* proved effective, the process of establishing these schools accelerated and their number jumped from four to ten between the years 1847 and 1852.[23]

Based on the same report, a council by the name of *Meclis–i Maarif–i Umûmiye* (Council for Public Instruction) was established in July 1846 under the supervision of the Minister of Foreign Affairs, Mustafa Reşit Pasha. The Council for Public Instruction, which was responsible for education matters and for controlling the activities of educational institutions, gave priority to the reform of secondary education. The Council also discussed the measures that needed to be taken to prepare the students for the Dârulfünûn and reorganised the *mahalle mektepleri* (parochial schools).

The Council of Public Instruction was under the joint supervision of the Minister of Foreign Affairs and the head of the Supreme Council of Judicial Ordinances; this reflected the clear secularization of education. Previously the affairs of education were overseen by the office of the Şeyhülislam, a dignitary responsible for all matters connected with canon law and religious schools, who stood next to the Grand Vizier in the official hierarchy. Henceforth, however responsibility shifted to the *Bab–i Ali* (Sublime Porte), namely the government. Moreover, it was not by coincidence that the Council of Public Instruction was put under the supervision of two high institutions active in the reforms. The intellectuals of the Tanzimat realized that without improving education, the reforms they were trying to implement would fail. Thus, they tried to take control of the educational system to facilitate implementation of the reforms. The organization of teaching was no longer decided by the office of the Şeyhülislam, but controlled rather by the bureaucrats of the Tanzimat.

Nineteenth–century Ottoman administrators sought to answer the need to reform the state and social life by reforming education. As a first step, the state recruited the newly trained bureaucrats and officials for the recently formed governmental divisions. This led the state to strive further to train such personnel in new schools; graduates in turn, had to be given opportunities of employment. Throughout the nineteenth century, there was a need for trained civilian personal in such fields as agriculture, animal breeding, forestry, mining, engineering, industry, fine arts, and law. To fill this need, the state immediately worked on founding schools with systems based on European models.

As a second step, the state needed to train teachers to educate new generations of students. To meet this need, statesmen proposed a new program for secondary schools such as the *Rüşdiye, Idadi*, and *Sultani*. Teacher training schools for men (*Dârulmuallimin*) and for women (*Darülmuallimat*) were estab-

lished in 1846 and 1869 respectively, and these were staffed by Europeans and Ottomans who had been trained in Europe.

Ottoman students in Europe

The practice of sending students to Europe started in 1827, when four students in the *Enderun Mektebi (Palace School)* were sent to be educated in France. Their expenses were met by the imperial treasury, and all four studied military fields. Prior to the proclamation of the Tanzimat in 1839, thirty-six students went to London, Paris and Vienna in order to study European technology; they were later employed in Ottoman military factories and workshops such as the arsenal, gunpowder works, rifle & cartridge factories, and the foundry.

After 1839, selected students who wished to receive training in nonmilitary fields were also sent to Europe by the state. In addition the Tanzimat reforms allowed a great number of non-Muslims to go to Europe in 1840. The ratio of Muslims and non-Muslims varied over the years. Between 1848-1856, only about fifty students were sent to Paris; this number rose to sixty-one between 1856-64. An Ottoman school by the name of *Mekteb-i Osmanî* opened in Paris in 1857 to enable the many Ottoman students studying arts and sciences in this city to follow the classes held in various French schools. Prior to 1864, all the Ottoman students in Paris studied in this school. Between 1864-1876, a total of ninety-three students were sent to Paris; forty-two to study science, and fifty-one to receive apprenticeship training. On January 13, 1870, twenty students from the *Mekteb-i Sanayi* (The School of Arts and Crafts) left for Paris to be trained in various handicrafts such as carpentry, ironwork, and tailoring. Thus, the number of students sent to Europe gradually grew. Beside those who received military training, there were others who studied civilian professions and the arts.[24]

Attempts to establish an Ottoman university

In the history of Ottoman education, the Dârulfünûn stands as a unique civil institution of higher education with no counterpart in the classical system. The initiatives for its founding dated back to the middle of the 19th century. The idea of establishing the Dârulfünûn arose mainly from the problem of public education, rather from the concerns of the military. In 1846, the Council of Public Instruction defined the aim of Dârulfünûn as "to train enlightened civil servants (*münevver bendegân*) who would serve the nation in the best possible way." This training encompassed all disciplines.

In November 1846, a contract was signed with Fossati, a Swiss architect of

Italian origin to construct a building which would resemble the large European universities. The construction took many years. However, public lectures started in 1863, before the project was complete. The first lecture on physics and chemistry with some experimental demonstrations was given on January 13, 1863 by the chemist Derviş Pasha. All year long, free lectures were offered on topics related to physics, chemistry, natural sciences, history and geography. These lectures appealed to both state dignitaries and the general public. When the building was completed in 1865, however, it was given to the Ministry of Finance, and a new one was planned for the Dârulfünûn. Public lectures continued in the mansion of Nuri Pasha, but it burned down in 1865. Efforts to establish a university, though, continued in the coming years.

In 1869, the second building was completed and instruction began. That same year, the *Maarif–i Umumiye Nizamnamesi* (Regulation for Public Instruction) was promulgated, reorganizing the entire educational system.[25] Fifty–one items concerning the Dârulfünûn in this regulation reflected strong French influence. This new institution was named *Dârulfünûn–i Osmanî* (Ottoman University), and it was divided into three departments : philosophy & literature, natural sciences & mathematics, and law. The graduation requirements stipulated three years of study followed by one year for the preparation of a thesis, that is, a total of four years. Individuals having reached sixteen years of age and in possession a preparatory degree or equivalent knowledge were allowed to enroll. Each department had a detailed curriculum culminating in a graduation thesis, and offered a teaching certificate. The regulation also called for the installation of such units as a museum, library, and laboratory. The courses were based on the French model ; but the department of philosophy & literature was to offer Oriental languages like Arabic and Persian, as well as Western and classical languages such as French, Greek, and Latin. The Law department was to teach both Islamic and Roman law.

Students began to enroll on April 8, 1869. Although a thousand students applied, 450 were admitted after examination. On February 20, 1870, the Dârulfünûn was inaugurated with a grand ceremony attended by the Grand Vizier Âli Pasha, the Minister of Education Safvet Pasha, and the other dignitaries. Hoca Tahsin Efendi, who was from the ulema class was appointed director of the Dârulfünûn because of his ability to balance between Islam and the West, and harmonize the new with the old. Educated in a traditional medrese, he had also served in 1869 as the director of the Ottoman school in Paris. He was thus well prepared to mediate between Islam and Western science, rather than dwelling on their conflicts.

Unfortunately, the program outlined by the Dârulfünûn's regulations was

not fully realized because of the lack of both qualified teachers and students, and all students had to follow the same courses. This was why this second attempt did not bear the expected fruits.[26]

In 1873, the Minister of Education Safvet Pasha, appointed Sava (Sawas) Pasha, the director of the *Mekteb-i Sultânî* (Imperial Lycée of Galatasaray), to set up the Dârulfünûn without burdening the treasury. In this third attempt, the plan was to establish the Dârulfünûn upon the foundations of the Imperial Lycée of Galatasaray, which had been functioning since 1868. Thus, an institution of higher education would be laid on the basis of an institution of secondary education.

This new Dârulfünûn, named the *Dârulfünûn-I Sultânî* (Imperial University), consisted of three departments: Law, Sciences, and Letters. In the official correspondence, these were called *Mekâtib-i Aliye* (literally high level schools). The *Dârulfünûn-i Sultânî* started operating in the 1874-75 academic year, and included the *Hukuk Mektebi* (School of Law), and the *Mühendisin-i Mülkiye Mektebi* (Civil School of Engineering). The original plan to set up a School of Sciences was unfortunately not realized. Moreover, no information allows us to ascertain whether the *Edebiyat Mektebi* (School of Letters) started to function or not. During the first academic year, the name of *Mühendisin-i Mülkiye Mektebi* was changed to *Turuk u Maabir Mektebi* (School of Public Works).

Those who attended courses for four years, prepared a scholarly thesis, and defended it successfully, would graduate with the title "Doctor". The jurists would be employed in the Ministry of Justice, and the engineers, in the Ministry of Public Works. Those who graduated from the Faculty of Letters would be appointed as teachers of literature. Students who didn't prepare a dissertation would take a test easier than the doctoral examination. Such graduates of the schools of Law, Turuk-u Maabir and Letters would be appointed as secondary lawyers, engine drivers, and teachers.

At the end of the 1874-75 academic year, 21 students entered the final examinations at the School of Law, and 26 in the School of Public Works. The majority of these students were non-Muslim citizens. In 1881, the School of Law and the School of Civil Engineering became attached, respectively, to the Ministry of Justice and the Ministry of Public Works. Thus, these schools continued to function under state control. The new status helped to redress the balance in favour of Muslim students.[27]

By the end of the 19th century, then, there were schools of higher education where students could specialize in the fields of civil service, commerce, industry, engineering, and architecture. These schools were designed to meet state's needs for qualified personnel in these fields. This represented a radical change in

Ottoman education, since there were no such institutions in the classical period. On February 14, 1895, the Grand Vizier Said Pasha submitted a petition to Sultan Abdülhamid II requesting in addition to these higher institutions of professional training, the establishment of a Dârulfünûn (university). In his petition, he proposed that this institution should function like the American and European universities, and include five *darülicâze* (faculties) where students could receive scholarly education.[28]

Prior to the 20th century, attempts to found a university with several departments were not as successful as expected. The beginning of the 20th century (1900) saw the creation of a university by the name of *Dârulfünûn-ı Şahane* (Imperial University). Its success owed much to fifty-five years of prior experience. Other contributing factors included a sufficient number of secondary schools and well-educated students, and firmly established institutions of higher education, such as the schools of law and medicine. The *Dârulfünûn-ı Şahane* became the nucleus for all modern Turkish universities.[29]

Conclusion

Ottoman educational reform started in the first half of the 18th century, with institutions created within the Ottoman army to give theoretical and practical training in science, mathematics, and modern warfare. They were the nuclei of Western-type schools representing in a way the first examples of the Ottoman-Western synthesis. The statesmen and scholars of the time believed that the country could regain its power through a modern, regular army. They thus turned to the West within the framework of Western-style military reforms, in order to train officials in modern sciences.[30]

The Imperial School of Military Engineering, established within the framework of 18th century military reforms, sought mainly to train engineers, or more precisely, *mütefennin zabits* (officers endowed with technical knowledge) for the army. The 19th century witnessed the creation of the Imperial School of Medical Sciences and the Imperial School of Military arts, both founded to fulfill the needs of the army, and to train military physicians and officers respectively.

In the pre-Tanzimat period (end of the 18th and beginning of the 19th century), there were two kinds of teaching institutions: the medreses, the traditional Ottoman institution of learning, and the modern schools for military, technical education (engineering, medicine and military arts). The teaching provided by institutions for military education was different from that of the medreses and led to a new understanding of education. Examples of this new departure were first seen in the schools of engineering. At first, classical Islamic tradition and Western approaches coexisted peacefully, but from the second half

of the 19th century onwards, conflicts between the old and new and between religion and science began to surface.

The second stage in the history of modernization of Ottoman education and science started during the Tanzimat period (1839–1875) when the education of civilians emerged as a prominent concern. The state had to create schools in order to train the modern civil servants who would carry out the structural reforms that it proposed. The first schools thus focused on developing civil servants. Later on, schools expanded their scope and began to teach all those who wished to receive an education. The state also created schools to meet its needs in such areas as agriculture, cattle breeding, forestry, and mineralogy. Prior to the Tanzimat period, topics related to engineering, medicine, and pharmacy were taught in military schools, but later, civilian institutions were set up to prepare specialists in these fields. Schools were also established to prepare students for the civil service and for law. Particularly after the promulgation of the Regulation for Public Instruction in 1869, the curricula of the schools were prepared under European influence, but some aspects of Ottoman cultural and religious life were added to it.

Although much work was undertaken to modernize Ottoman education in the 19th century, the system was not research oriented. There were Ottoman scholars who pursued research in Europe in the fields of chemistry, medicine, and mathematics —Vidinli Tevfik Pasha, for example, prepared a dissertation on linear algebra, and his thesis was printed in English —but such cases were rare. The absence of research in the Ottoman educational system in a way reflected the Ottoman administrators' understanding of modernization. In their impatience to reestablish parity with Europe, they tried to transfer European science and technology in the quickest way possible. They thus overlooked the necessity of research in a modern educational system.

Despite all the difficulties encountered in modernization, it may be argued that the result was not without success. Statistics show that the number of students attending state-run secular secondary schools doubled between 1867 and 1895. At a later date, there were at least 7,000 state schools at all levels, including nearly 4,000 upper level institutions. Altogether, some 1.5 million children—about 20 percent of the total eligible—received schooling.[31]

Literacy rates may also help to evaluate the success of Ottoman educational system. One approximate measure of literacy is the enrollment in primary schools. If we use this as a standard, selected Ottoman districts fare well in comparison with a number of European countries. The proportion of Ottoman children in Istanbul primary schools was greater than the national averages in Spain, Italy, and Russia. In seven Ottoman provinces representing the Balkan,

Arab, and Anatolian regions, the proportion of children in primary schools surpassed the Italian and Russian national averages.[32] Thus one could argue that the 19th century Ottoman efforts in modernizing the educational system were not unsuccessful as previously thought.

The educational program of the Ottoman state throughout the 19th century can thus be summarized as follows: besides establishing new schools, the Ottomans had to create schools to train the teaching staff. Experts and instructors recruited from Europe and Ottomans educated in Europe taught in the technical schools. However, contrary to the classical Ottoman schools which were financed by endowments, these new institutions had to be entirely financed by the state. In the classical period, none of the medreses were state institutions. They were run by endowments, even if the medrese was built by the Sultan himself, or a member of the imperial family. Built on the endowed land and provided with endowed income, the medreses enjoyed financial autonomy. The creation of new state schools required great investments, and this lead to problems of resources. These problems account for many of the failures in the reorganization of the Ottoman educational system.

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Notes

1. Ekmeleddin İhsanoğlu, "Ottoman science in the classical period and early contacts with European science and technology," 1–48.
2. Mustafa Kaçar, *Osmanlı devletinde Mühendishane'lerin kuruluşu*; E. İhsanoğlu, "Ottomans and European science," 37–48.
3. Niyazi Berkes, *The development of secularism in Turkey*, 47–48.
4. M. Kaçar, *Osmanlı devletinde Mühendishane'lerin kuruluşu*, 19–35.
5. *Ibid.*, 67–70.
6. Frédéric Hitzél, "Défense de la Place Turque d'Oczakow par un officier du génie français (1787), 639–655.
7. Kemal Beydilli, *ürk bilim ve matbaacılık tarihinde Mühendishane*, 24–26.
8. In 1830 the school moved to the Heybeliada in the Prince Islands and took the name of *Mekteb–i Bahriye* (School of Naval Officers). In 1839 it is transferred to Kasımpaşa district and in 1845 moved back to Heybeliada and is named *Deniz Harb Okulu*. M. Ç. Uluçay and E. Kartekin, *Yüksek Mühendis Okulu*, 22–28.
9. E. İhsanoğlu, *Başhoca İshak Efendi*, 9; K. Beydilli, *Türk bilim ve matbaacılık tarihinde*

Mühendishane, 78–79 ; M. Kaçar, *Osmanlı devletinde Mühendishane'lerin kuruluşu*, 152–154.

10. E. İhsanoğlu, *Başhocaİshak Efendi*, 14–15.
11. *Ibid.*, 33–43
12. Ali İhsan Gencer, *Türk denizcilik tarihi araştırmaları*, 54–70.
13. Aykut Kazancigil and Bedizel Zülfikâr, *XIX. Yüzyılda Osmanlı imparatorluğunda anatomi* .
14. E. İhsanoğlu, "Tanzimat öncesi ve Tanzimat dönemi," 354–355.
15. E. İhsanoğlu and M. Kaçar, "Aynı Münasebetle iki nutuk : Sultan II. Mahmud'un Mekteb–i Tıbbiye ziyaretinde irad ettiği nutkun hangisi doğruduru" 44–48 ; E. İhsanoğlu and Feza Günergun, "Tıp eğitiminin Türkçeleşmesi meselesinde bazı tespitler," 127–134.
16. Mehmed Esat, *Mirat–ı Mekteb–i Harbiye*, 10.
17. E. İhsanoğlu, "Tanzimat öncesi ve Tanzimat dönemi," 356.
18. Adnan Şlşman, *Tanzimat döneminde Fransa'ya günderilen Osmanlı öğrencileri*, 8.
19. M. Esad, *Mirat–ı Mekteb–i Harbiye*, 37–38.
20. *Ibid.*, 50, 142–143.
21. Invited to Istanbul in 1841, the Prussian veterinarian Godlewski was asked to establish a school for veterinary training. The same year he organised a training course for soldiers to diagnose and cure horse diseases. Osman Nuri Ergin, *Türkiye maarif tarihi*, 427–430.
22. Halil İnalcık, "Sened–i ittifak ve Gülhane hatt–ı hümayunu," 356.
23. Faik Reşit Unat, *Türkiye eğitim sisteminin gelişmesine tarihi bir bakış*, 80.
24. See annex in A. Şlşman, *Tanzimat döneminde Fransa'ya gönderilen Osmanlı öğrencileri.*
25. *Düstur*, 194–210.
26. E. İhsanoğlu, "Dârulfünûn," 174–179.
27. *Ibid.*, 179–183.
28. Said Paşa, *Said Paşa'nın hatıratı*, 572–580.
29. E. İhsanoğlu, "Dârulfünûn," 90.
30. E. İhsanoğlu, "Tanzimat öncesi ve Tanzimat dönemi," 350.
31. Kemal Karpat, *Ottoman population, 1830–1914. Demographic and social characteristics*, 219
32. Donald Quataert, *Manufacturing and technology transfer in the Ottoman empire 1800–1914*, 11.

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_____ and M. Kaçar, "Aynı münasebetle iki nutuk : Sultan II. Mahmud'un Mekteb-i Tıbbiye ziyaretinde irad ettiği nutkun hangisi doğrudur," *Tarih ve Toplum*, No. 83 (1990), 44–48.

_____ and F. Günergun, "Tıp eğitiminin türkçeleşmesi meselesinde bazı tespitler" in A. Terzioğlu, ed., *Türk tıp tarihi yıllığı = Acta Turcica histoirae medicinae, I. tıp tarihi ve deontoloji kongresine sunulan tıp tarihi ile ilgili tebliğler* (Istanbul : Istanbul Universitesi Istanbul Tıp Fakültesi Deontoloji ve Tıp Tarihi Anabilim Dalı ,1994), 127–134.

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