
2. Deni, ibid., p. 111.

3. For work on decimal fractions made approximately in the same period by Simon Stevin in the west see, Renati Denis, " Decimal Fractions of Takribullah bin Muhammad and Applied Trigonometry and Astronomy", *Osmo Habilin Argyomen* (Christian Science Invovements), no. 2, (Jaametia 1990), 196-198.


5. For detailed informed and tables see, Renati Denis, *One Simple Form Trigonometry for the Problem of Infinite Quatities in Different Size Given by Takribullah bin Muhammad*, (Atsah University). Diss. on Takribullah Fakultad (Language and History - Geography Faculty), (Atsah University). (Atsah University), vol. 16, (Amsun 1993), pp. 59-96.

6. Because, all intermediates are being lines made by main area the definition was made like this.

7. In meomorization, the operation to find or estimate the value of (x) using known values.

8. These samples are given, so make them easy, it is supposed that Takribullah used the decimal point, and trigonometric and algibraic.


---

**BIBLIOGRAPHY**


Denis, Renati, *Obervation Made in Islamabad Observatory*, (Bulbas (Bullaria), vol. 57, no. 218, April 1993, p. 162-172.

Siilik Zeki, p.113-120.


For example, declaration of a natural body, in other word the height of the esquad, like at prime, for given values, d = declination, e = slope of ecliptic and i = longitudinal, was finding using sin d = sin i x sin e.
ve modern medical education with the aim of educating the doctors to be employed within the health services for the Ottoman Army, it was stated that besides the names of medicines and diseases, the Turkish and Arabic names of the herbs would be taught to the first year students of this school. There is no record in this Medical College, which began to give educational service in 1242 A.H. (1826-27 A.D.) about the qualifications of the people teaching the names of herbs. However, the fact that Beşket Effendi declared that the names of diseases, medicines and herbs would be taught by the classroom teacher arises the probability that the names of the herbs used to be taught by the Imperial lecturer Mirsi Seyyid Ahmed Effendi who had been appointed as the teacher of this class.

We can infer out of the verbal note of Musafir Beşket Effendi given in 1853 and out of the article about the curriculum of the Imperial Medical College which was published in the newspaper Ta'lihat-i Vehbi in 1834 that the botany course firstly was included into the fourth grade curriculum, under the name of "the Science of Plants" in the year 1834, and was taught by a physician named Civani. In the following years, the Science of Plants courses were continued to be given probably by the other last grade lecturers named Ser-civani, Tahir Istepan (Istepanof). Another point strengthening the possibility that the botany courses in the Medical College used to be given by Dr.Istepanof Karadodgor (1789-1867) is his intense activities, in the following years, in the field of botany. He wrote about the History of Nature (Histoire naturelle) and published a botany lexicon. He translated a botany book named "Botany in Brief" from English to Turkish, but this translation of him was not published. Additionally, his book "Bezmarar Complete" which was written in French remained uncompleted.

**ISHAK EFFENDI AND BOTANY IN THE MECMUA-I ULUM-I RIYAZIE (THE JOURNAL OF MATHEMATICAL SCIENCES)**

Another important event of the year 1834, when Botany was firstly included into the curriculum of the Medical College as a separate lesson, was that the first Turkish text about Botany was published in the work of Engineering Faculty Chief Lecturer Ishak Effendi that was named "Mecmu-i Ulum-i Riyazie" (the Journal of Mathematical Science). The fifth part (p.65) of the third article from the end of the fourth volume of this work (1834) focused on the subject of Botany. In this article related with the natural sciences, Ishak Effendi divides all the objects in the world into two main groups as organic substances and inorganic substances. It is stated in this article that the organic objects which move to find food were called "animals" and those which do not move to feed themselves were called "plants". The classification of the objects in this way can be considered as the traces of the classical natural history approach going back to Aristotle (384-322 B.C.) and Plinius (23-79 A.D.) and continuing until the emergence of modern biology in the nineteenth century.

In the fifth part which includes the information about Botany, after a brief definition of Botany is made, the plants are classified into three main groups: the big trees, the shrubs and the herbaceous plants. In addition to that, it is stated in this part that the roots and galls were common among all these three groups and the trunks were exclusively a part of trees and the ears of the herbaceous plants. After it is stated that the trunks and roots of the trees are composed of the bark, the lignified trunk are explained and it is stated in the meantime that the age of a tree can be found out by means of these circles. After that, the parts of a complete flower are explained. These parts are: the calyx, corolla, stamen, ovary, stigmas and stigma.

In the part focusing on reproduction, it is stated that although the ancient scientists had thought that reproduction without seeds had been possible, it had been understood, in recent years, that the plants which had been thought to emerge without seeds had, in fact, come out of the seeds which had been mixed into the rotten remains of the dead plants and this had been the only way of reproduction in plants. Additionally, Ishak Effendi also stated in this part that the maggots emerging in feed had been thought, before, to come out from the rotten meat, but in recent times, it had been proved certainly by experiment that these maggots had come out of the eggs laid by flies. It is very obvious that the event mentioned in this part was related with "spontaneous reproduction" which had been one of the most controversial issues of Biology of the eighteenth and nineteenth centuries.

In the further parts, some facts are stated: the plants lose water by means of perspiration; they re-compose this lost amount of water by means of suction the rain water, irrigation water and streams; the essential minerals are sucked into the plants along with this water; the sap which also includes these mineral salts, is carried to the farthest parts of the plants through the capillary tubes; the sap is always in motion within the plants, this circulation is proved by experiments and also the wind has a role in this circulation. On the other hand, it was also stated that, as similar to the perspiration and inspiration in animals, the plants also excrete the waste products out through their trunks, branches and leaves.

In the part focusing on nutrition, it is stated that the plants take the food they need through their roots and leaves; they make use of the mineral salts in the soil and the carbon-dioxide in the air, and they expel oxygen during the day and carbon-dioxide during the night (the phenomena of inspiration and photosynthesis) And after that the article focuses on the subject of agriculture, and it is stated that plowing the soil makes it easier for the plants to suck in the water within the soil and increases the benefits which the plants provide from the air, rain, heat and snow; that if the same kind of plant is grown every year in the same field, the food used by the plant will decrease in amount and in order to re-compose this lost nutrients it is necessary either to follow the field or to add animal manure to the soil to enrich the nutritive content of it; and that the excessive irrigation is harmful for the fruits, vegetables and cereals. Consequently, in this text of six and a half pages, more than general classification of Botany (taxonomical botany) and physiology, the use of Botany are explained.

**BOTANY IN MAKHOS-I TEBHIYE-I SABUNE (THE IMPERIAL MEDICAL COLLEGE)**

By Charles Amboise Bernard (1808-1844)

Topkapi (the Imperial School of Medicine) and Cerrahpasa (the School of Surgery) which were founded in the Tophane-i Vehbi Mansion in Vezneciler in the year 1827, after giving service separately in various buildings for some years, were united under the name 'Makhsis-i Tebhiye-i Sabune' (the Imperial College of Medicine), in 1839. The botany lessons were given in the first years of the Medicine, Surgery and Pharmacology departments. In the first years after the Imperial Medical College began to render its service, these lessons were given by an Austrian physician, Charles Amboise Bernard, who was the director of the school and was teaching the theoretical surgery lessons as well. Differing from the method followed before, Botany lessons were taught not by means of engravings, but by means of demonstrations on the live plants grown in the botanical garden founded by the botanist Skalak who had come from Vienna. It is understood that as from the academic year of 1842-43, these lessons were taught by Salih Effendi, a student of Dr.Bernard. Considering the fact that Salih Effendi was graduated from the Medical College, it can be inferred that he began to teach botany while he was still an intern student. He assisted Dr.Bernard both in lessons and in keeping the botanical garden of the college in order.

Since most of the medicine consisted of drugs and preparations made of these drugs, the botany lessons were especially important for Dr.Bernard. Besides one of the eight books he had bought in Vienna in order to bring to Istanbul along with him, the first book he published in Istanbul was also a botany book. This book, which was published in French under the title of "Eléments de Botanique" in 1842, is the first Medical Botany (Pharmacetical Botany) book written and published in Turkey. Although Bernard did not explain of which previous works he had made use while preparing his book, he stated in the preface that he would follow the classification system of Justus which had been amended by A. Richard. When we
compare the book 'Éléments de Botanique' with the two books of A. Richard dating back as 1838 and 1839, we can obviously see that Bernard had made use of A. Richard's works.

After two prefaces, one in French and the other in Turkish, and each two pages long, the definition and object of "Botany" are explained. The organs of the plants are explained in the first part, and the plant classification systems of Tournefort, Linnaé and Jussieu are given in the second part. The third part is the systematic part. In this part, the plants are studied in accordance with Jussieu's system, and the information about the location, usage, pharmaceutical type and effects of these plants are given. According to information given in the book, the number of families of the flowerless plants (Cryptogamia) are 5, the number of monocotyledonous families are 13, and the number of dicotyledonous families are 72. In the last four pages of the book, there are 94 figures. 85 of these figures are about leaves.

Bernard's deep knowledge in the field of Botany and his strong interest in this discipline can easily be understood from the observations written in his second book. He explained, in this book, the flora around the Burgas-Gemlik road and emphasizes the importance and attractiveness of the fauna of the high altitudes of Uludağ for the naturalists and scientists. And it is also recommended in the book that the patients being cured at thermal springs should make, in their spare times out of the bathing and resting hours, botanical, mineralogical, and geological researches in the surrounding mountains. Dr. Bernard also collected plant samples and included two lists of these plants in his book.

Another contribution of Bernard to the botany education in Turkey is his establishment of a botanical garden in the Imperial Medical College. He brought, for this purpose, some experts and gardeners from Europe. Friedrich Wilhelm Nee (1798-1858), who was a German pharmacist, was appointed to the directorate of the botanical garden in 1844. Nee established a herbarium, by using the plant samples he collected from the vicinity of Istanbul, in 1845. This herbarium burned up, together with the building of the Imperial Medical College, during the fire of 1848. Although it was stated that the Museum of History of Nature, which was founded with the contributions of the Hungarian Dr. Abdullah Beg, included 2725 plant samples in the year 1871, the herbarium in this museum couldn't have been kept until the present time.

SALIH EFFE NDİ (1816-1895) AND HIS CONTRIBUTIONS TO THE BOTANY EDUCATION

The botany lessons in the Imperial Medical College, that was initiated by Dr. Bernard, was continued in later times by Salih Effendi, who was one of his students. As we mentioned above, Salih Effendi had given, together with C.A. Bernard, in the Imperial Medical College, the lesson of "the Science of Plants" and took part in the works of foundation of the botanical garden, before his graduation from this college. The "Kingdoms of Nature" lessons which took place in the curriculum of the first 'Darülfünûse' (University) in 1863 were also given by Salih Effendi. After he had been pensioned off from his post in the Military Medical College in 1872, he continued to be a botany lecturer in the Administrative Medical College for many years, and gave the lessons of nature in the School of Teachers and 'Darülfünûse'. He arranged the garden of his house in 'Anadoluhisar', that is known today with the name of the 'Hekimhâne Yuget' (Doctor-in-Chief's Seaside Residence), as a botanical garden, and grew various plants and fruit trees there until his very old ages. Besides giving botany lessons, he assumed some high posts of the state for many years. He strove for the purpose of converting the language of the medical education into Turkish and freeing the medical literature from foreign words, and worked hard for the foundation of the Ottoman Medical Association (1860).

The only work of Salih Effendi mentioned in all the publications up to the present time is 'İsm-i Hayvanat ve Nebatat' (The Science of Animals and Plants), which has published in 1865. However, at the end of our research, we found out that he had published another book under the name of 'İsm-i Mandik-i Tiikirjar' (The Principles of the Anatomies of the Natural Sciences) in the year 1872 and that this work had been the second edition of the terminologically amended 'İsm-i Hayvanat ve Nebatat' (The Science of Animals and Plants) published in 1865. We, here, will give brief information about these two editions and the sources of the books.

İLM-İ HAYVANAT VE NEBATAT / THE SCIENCE OF ANIMALS AND PLANTS (1865).

As far as we know, this book of Salih Effendi contains the first Turkish botany text which is about the "taxonomical botany" and has been used in botany education. Although there is a 65-page text in Turkish about botany in the work of the head-lecturer Isahak Effendi, that was named 'Memur-i Ula-i Riyaziyi' (The Journal of Mathematical Sciences) (1834), this text does not contain any picture and deals, rather than systematical botany and plant physiology, with the practical and beneficial aspects of botany, so the possibility that it might have been used in botany education is very weak. On the other hand, the work of C.A. Bernard named 'Éléments de Botanique' (1842) was, although it was used in botany education, written in French and we can see the title of the book in French.

Salih Effendi started in the preface that he had prepared this book for use of all people, but especially to be used in higher primary schools. So, the book had the properties of a natural sciences book to be used in the secondary education. Likewise, as we will see later, the translation which he made from French was published with the same purpose: "in order to be used by the youth". It is known that in the higher primary schools (Rüşûflya), which had been founded within the framework of expansion and modernization of the education during the Tanzimat era (the Ottoman reformation of 1839), some scientific books written in Turkish were used in education. This information being stated in the preface written by Salih Effendi, makes us think that the course of natural sciences (about animals and plants) used to be given in the higher primary schools in about 1865.

On the other hand, the fact that Salih Effendi was a member of 'Mevki-i Maarifi-i Umamiye' (The Assembly of General Education) which had been founded in 1841 with the purpose of structuring the educational institutions, including the higher primary schools, in accordance with the requirements of that time. indicates that his purpose for translating this work was meeting the course-book needs of these schools. Additionally, if we consider the fact that Salih Effendi gave botany lessons at the Administrative Medical College in the first years following the foundation of this educational institution in 1867, and no separate botany course-book had been published before the year 1872, it may be thought that this book might have been used as an auxiliary course-book for the "Science of Plants" course included in the secondary grade curriculum of the Administrative Medical College.

On the other hand, we know that Salih Effendi was appointed as the lecturer of 'İsm-i Menadik' (The Science of the Three Kingdoms of the Nature; i.e. zoology, botany, and mineralogy) in 'Darülfünûse' which began to give educational service in 1865 by means of conference-lessons, and gave lessons on these fields, in 'Darülfünûse', in the years of 1863, 1864 and 1865. So, it is probable that Salih Effendi used his book named 'The Science of Animals and Plants' in these lessons and had made this translation for this purpose. Because, it is stated in the preface of the book that he used to give the lessons of the science of natural history to the people with the permission and will of the Sublime Sultan 'translated the book for the use of everyone'.

The Science of Animals and Plants. This book, which was printed in the Imperial Printing Office in 1865, consisted of 90 pages in total. The part about botany consisted of 9 pages totally. The part about botany consists of texts of 32 pages (pages 99-99) and of 7 plants (plates 19-25) including 106 figures. The book has no cover pages. The first page begins with a preface carrying the headline 'İsm-i Hayvanat ve Nebatat' (The Science of Animals and Plants).
Mehmed Ali Pasha (1837-1914): HIS PUBLICATIONS ON BOTANY AND AGRICULTURE

As the consequence of the translation works of Mehmed Ali Pasha who was a student of Salih Effendi and was, like him, a lecturer in the Military Medical College, a considerable increase occurred in the number of the botany books in Turkish. And certainly the fact that M. Ali Pasha had spent most of his life exclusively as a botanical lecturer had an important effect in this increase. Mehmed Ali, who had graduated from the Military Medical College in 1864 as a physician, worked in the Imperial Army as a doctor and then, in 1871, appointed as an "Assistant Lecturer of the Plants Course" in the above-mentioned college and later, in 1876, he became a lecturer. He established a botanical garden in the barracks garden of the college located in Demircali. He also gave botany lessons in the Administrative Medical College, developed the garden of this college in Kadırga into a botanical garden, and was appointed the manager of the college in 1892. Mehmed Ali Pasha, just as Salih Effendi, was a member of "Conseil de Tbilisi et Guzimije" (The Ottoman Medical Association) the main objective of which was to translate the Western medical and biological books into Turkish.

As the result of our investigations, we found out six publications of Mehmed Ali Pasha on botany. Three of these publications which we will introduce below are botany course-books which were translated from the works of Desire Cauver who was a professor at Lyon Medicine and Pharmacology Faculty. The other three books were treatises translated from the works of Du Breuil that gave information about growing trees.

Ulu-i Nusret-i Tbilisi i The Science of Medical Plants. This work was published in two volumes, in Istanbul, in 1875. It consists of 1247 + 40 pages and 230 figures. In the preface taking place in the first volume, Mehmed Ali Pasha stated that he had translated the book from the work of Cauver, that he had made additions from Richard and Bouguen and added some cryptograms and quotations to his book from the original works of Bary, Boudier, Descotis, Robin, etc. As the result of our researches, we determined that Mehmed Ali Pasha had used, as the main source for his book, "Nouveaux Elements d’Histoire Naturelle Medicale" by Cauver (1st edition: Paris, 1809; 3rd edition: Paris 1885). Mehmed Ali Pasha had translated only the botany and general introduction sections of Cauver’s work, had included some pictures and, instead, included some pictures from other books. The book was basically a rare book introducing also the medically used herbs. The classification systems of Jussieu and De Candolle were mentioned, and in the systematic part of the book, after the descriptions of each family, the medical and beneficial plants in these families were explained and their names in French and sometimes in Latin language were given and, being in parenthesis, the species names in Latin written in Arabic letters, the name in Turkish if there was any, their uses, the effective substances they include - sometimes with their chemical formulas - were added. The large families were studied by being divided into "tribes" (sub-families). The herbs having a strong effect, such as spagyrium, o-piniam, fogglo, dura, daryu, deadly nightshade and zerna, occupied a great deal of place in the book.

Ulu-i Nusret! The Science of Plants. The first volume of this two-volume work was published in 1885. The date of 1303 A.H. (1886 A.D.) is written on the cover page, but the date written on the last page of the same volume is 1307 A.H. (1890 A.D.). The book consists totally of 1504 + 12 pages and 232 figures. This work is the amended and widened second edition of "Ulu-i Nusret-i Tbilisi! (The Science of Medical Plants) which we explained above.

Kitaib-ül Nusret! The Book of Plants. This work of one volume consisted of 1000 pages and 132 figures. The cover page of the book carried the date of 1318 A.H. (1900 A.D.) and the last page the date 1317 A.H. (1899). In the paragraph carrying the headline "Yade-i Mawrize" (The Expression of the Translator), Mehmet Ali Pasha stated that he had chosen and translated parts of the original plants book written by Cauver. At the end of our researches, we found out that the mentioned book of Cauver was Cours Elémentaire de Botanique (I. Anatomie et Physiologie Végétale, 1892; II. Les Familles des Plants, 1885). We compared "The Book of Plants" with this original French book. We saw that the translator had translated the subjects in accordance with the original order, but he had eliminated some paragraphs and even pages which he had considered as too detailed, had also ignored some systematical tables and had not included the 31-page last part of the book focusing on the recent knowledge on the nucleolus, pollen and foecundation. Mehmet Ali Pasha also had greatly reduced the number of the
figures in the book and had taken just 20 of the 721 figures taking place in the original book. Although Couvelet had attached a great importance to details in the figures and included many anatomical pictures and figures showing the structure of flowers, Mehemet Ali Pasha had attached importance to the general appearance of the plants and included this kind of figures in his translation. On the other hand, we found that 31 of the figures included in the book that had not been taken from the book 'Elements de Botanique Medicale' which had been written by A. Miquain, a professor in the Faculty of Medicine in Paris.

The book consisted of two parts. In the first part, the cell, the tissues and organs and the tasks of organs were explained and the subjects of palaeontology and plants geography were added. The second part (pages 375-1000) was exclusively on the plant taxonomy and included the subjects of the classification of plants and explained the plant families in a systematic order. The number of the foreign words written in Latin alphabet were reduced to minimum, the Latin species and kind names were written in Arabic letters as they were pronounced, the family names were expressed by Turkish names; but the French names were also added beside some of these family names. The number of all the French words used in this way in the whole book was just about 120.

Mehmet-i Tükbâ-i Ezâr (The Subject of Tree Grafting), which was one of the three treaties Mehmet Ali Pasha published on agriculture, included the grafting types used for fruit trees (suckling, branch, cutting, leaf, sheared grafts, etc.), and the tools, material and methods used in grafting. The second treatise had the headline: 'Mehmet-i Tükbâ-i Ezâr' (The Subject of Tree Growing) which consisted of 128 pages and 21 figures and published in Istanbul in 1822/23. It dealt with subjects such as maintenance of the fruit trees, grafting methods, pruning methods, plantation and cultivation of fruit trees, fruit collecting and keeping methods. The third treatise with the headline: 'Ustâl-i Tekir-i ve Türkib-i Kürüm' (the Methods of reproduction and improvement of the stocks of grape vine) which consisted of 88 pages and 23 figures described 1887/88 and included the maintenance and reproduction of olive trees and vines. We have found out that "Moniteur Breuil" who was mentioned in the cover pages or prefaces of these treatises was M. Alphonse de Breuil (1811-1890) who was an agriculture and tree cultivation teacher in Rouen and that Mehemet Ali Pasha had used some parts of that French writer's book named 'Cours Élémentaire de Horticôale et d'Agriculture' as a source for his translation. Mehemet Ali Pasha had chosen some parts one from his detailed and extensive work written in French, translated them by summarization and published them in the form of three treatises we mentioned above. It is rather remarkable that, Mehemet Ali Pasha, contrary to most of the other Ottoman writers who made translations from the Western books, mentioned the names of the writers whose books he had translated.

ESAD ŞEREFEDDIN KÖPRÜLÜ (1866-1942) AND HIS WORKS IN THE FIELD OF BOTANY

Esad Şerefeddin who used to be the honorary assistant of the botany lecturer Mehmed Ali Pasha while he was still a student at the 'Mehmet-i Tükbâ-i Ezâr' (The Imperial Medical College). After his graduation, firstly worked at the Veterinary Department in the Military Medical College as a lecturer of the science of plants. Then he moved to the Military Medical College, became there the assistant of Dr. Mehmed Ali and gave botany lessons in both military and non-military medical schools. Then he worked as a course instructor of plants and also as a lecturer, in the Administrative Medical College which became a division of 'Darülfünûne' after its foundation in 1900 and took the name 'Darülfünûne Tip Fakültesi' (Darülfünûne Faculty of Medical Sciences), in the Mathematical and Natural Sciences Department of 'Darülfünûne' (which later named, in subsequent, as the Department of Sciences, the Madrasah of Sciences and, in 1924, as the Faculty of Science). He had continued his job in 'Darülfünûne' until he was dismissed with the University Reform of 1933. E. Şerefeddin, believing that live plant collections were very important in botany education, established a botanical garden in every educational institution he rendered service. Firstly, he established botanical gardens in the barracks garden of the Imperial Medical College in Demirkapi, secondly in the garden of the meneneme Mustafa Paşa Mansion of the Administrative Medical College in Kadırga, and then beside the new building of the Darülfünûne Faculty of Medical Science in Haydarpaşa. He strove, during his service as a lecturer, to enrich these botanical garden with the medical plants he brought from foreign countries. And lastly, when he was appointed as the instructor of Plants courses in the Faculty of Sciences, he established a botanical garden in this Faculty which was rendering service in 'Zeynep Hanım Mansion' in Vesrerek. As a result of our research, we found out several of his books, including the one which was prepared by his students, but published with the name of E. Şerefeddin, and also an article written by him and published in the Journal of Faculty of Science. These publications are given below in chronological order.

Mehmet-i Hüm-i Nahâv (Principles of the Science of Plants)

This book was published in Istanbul in 1901. It consisted of 208 pages and 138 figures. Since it was prepared for the new-beginner students in the courses of 'Science of Plants', it was written, as much as possible, without dealing with details. After a brief history, the animal-plant comparison was made, the branches of Botany were introduced and then the organs of the flower plants (the phanerogamous plants) were introduced.

The reproduction of the plants by means of twigs and by the method of layering was explained at the end of the subject of 'roots'. The grafting and the methods used were touched on at the end of the subject of 'the trunk'. The fact that there are French words, even they are few in number, in the book proves that the original source books used in preparation of the book were written in French. E. Şerefeddin stated in the preface that he had arranged the 'Principles of the Science of Plants' in four volumes and he had assigned each volume to a class of the Imperial Medical Secondary School. And most probably, the book we have is the first volume of these four books. The other books might have stayed as drafts or their publication might have left incomplete.

Nebati-i Tübâbes Deresi (The Lessons of the Medical Plants)

Published in Istanbul in 1910, this book consisted of 462 pages and 85 figures. The name of E. Şerefeddin was written on the cover page of this lithographic book. The fact that there are many different names and signs on the figures and at the end of the chapters leads us to infer that the book was prepared by E. Şerefeddin's students. The book begins directly with classification and introduces the main families taking place in the Phanerogamous and Cryptogamous groups. The distribution of the plant species throughout the world, vegetation types, and the methods of collecting, drying and preserving the plant samples were also mentioned. The number of the French words used in the book was very limited. Additionally, the stages of the plants mentioned in the book in medicine and other fields were touched upon briefly.

Nebati-i Seyahatname (The Plants of Pharmacy)

This book was published in Istanbul in 1912. It consisted of 704 pages and 117 figures. This book is the most well-known work of E. Şerefeddin. A. Hâkim (1885-1961) used this work of E. Şerefeddin to a great extent while preparing the list containing the Turkish counterparts of the Latin plant names he had mentioned in his book named 'İşıkkâr-i Nebâvân' (Pharmacum-ботан) and dated 1940. E. Şerefeddin, as he expressed himself, aimed, in this book of him, at introducing especially the plants having medical use and partly the industrial and agricultural plants. Only the phanerogams were studied in this book. The morphological and sometimes the histological characteristics of the families were expressed, the medical plants and the other beneficial species were introduced together with the efficient substances they included, and information were given about the kinds of crop plants and their cultivation. Throughout the book, the family names were written in Turkish and the names of the species were written in Latin.
French, and the species names in Turkish, Latin and French. The Turkish plant names were either native words or had been translated from French or Latin. The meanings of some Latin words were explained, in footnotes, together with their origins. Most of the scientific terms were the Turkish terms of that era, and some of them were French words adopted in Turkish.

E. Şefikeddin explained, in the preface, that he had made use of foreign sources, but he didn’t give the names of these sources. However, by considering the signs put on the pictures in the book, we inferred that one of the book he had used as a source was ‘Praxis de Botanique Pharmaceutique’ (volume II, Maloine, Paris, 1909) written by L. Beille.

Hafiz İbrahim Nahdat (The Plants with Concealed Fecundation)

This book was published in 1917 in Istanbul. It consisted of 112 pages and 39 numbered pictures. In this lithographic book, after a brief table classifying the thallophytes had been given, the subjects of bacteria, anthocyanins, sterilization, fermentation and pathogenic bacteria were studied. And then the chemical combinations and the classification of the fungi were explained; the Mycosomyetes and Oomycetes groups of fungi were introduced and the subjects of yeasts, which were included in the Ascomycetes group, the alcoholic fermentation, yeast, beer and wine were studied. This book, in fact, had been a brief draft of the first 552 pages of the first volume of ‘Hafiz-i Hafiz Nahdat’ (The Plants with Concealed Fecundation) which was written by the same writer and published in 1924-25.

Hafiz-i Hafiz Nahdat (The Plants with Concealed Fecundation)

This book consisted of two volumes. It was published in Istanbul in 1924 (Volume I) and in 1926 (Volume II). In this lithographic book, E. Şefikeddin studies the Flowerless Plants (Cryptogams). The bacteria and fungi were studied in the first volume (which consisted of 771 pages and 296 figures); and the licorices, mosses, liverworts, ferns and horsetails were studied in the second volume (which consisted of 527 pages and 399 figures). So, the second volume included all cryptogams other than the bacteria and fungi and a chapter for Thallophytes. While writing his book E. Şefikeddin made use of French sources, but he didn’t reveal the names of these works in the book.

Although it has been noted in some books that E. Şefikeddin had written three books, namely ‘Histo- logy’, ‘Microscope Technique’ and ‘Parasitic Cryptogam- rams’, the publication of which had not been compiled, we do not have, at the moment, any document proving these records. Additionally, although it is very clearly understood from the correspondence that Eyal Şefikeddin prepared a book named ‘The Poisonous and Edible Mushrooms’ at the request of the Turkish Republic of the Ministry of Health and Social Aid, sent this book to the above-mentioned Ministry in 1939 and it was decided that this book would be printed in 2000 copies, we could find such a publication neither in the Istanbul Directorate of Health, nor in the Ministry of Health in Ankara, nor in the libraries.

Dr. Serafettin Tevfik Teremiz, (1879-1957) and His Publications on Botany

Dr. Şefikeddin Teremiz, who worked in Beirut and Bursa after his graduation from the Ad- ministrative Medical College in 1903, moved to Is- tahanb and became the assistant of Dr. Şefikeddin Köprülü in the same college. He worked as a “science of plants instructor” in the Department of Pharmacy and Dentistry of the Istanbul Darülfünan, between 1909-1933. In spite of all difficulties he faced, he could manage to found a botanical garden behind the school building in Kadırga, and a laboratory in the exposition building of the old College of Medicine. There was about 10 microscopes and some educational materials brought from Europe in this laboratory, and the students used to practice their first year botany lesson there. We have determined five publications by Dr. Şefikeddin Teremiz on Botany. Four of them were brief and concise course books on Botany lessons he used to give, and the fifth one was the text of a conference which he had given about the subject of ‘biogenesis’ and published in the first five successive numbers of the journal ‘Güneş Kimyager’ (The Young Chemist) in the years 1911-1912.

İlahi-i Nihatat (The Science of Plants). This work was published in Istanbul in the year 1924. It consists of 208 pages. 138 figures were used in the work. The work concerns plant morphology. With an aim to have them to follow the systematic of the medical plants, the work provided students with basic information. The work was written for the students who start to study botany in the very first class of Phar- macy and Dentistry Schools. French equivalents of se- veral terms were written beside them.

Tebbîe Nihatatı (The Medical Plants). By using the newly-adopted Latin letters, this work was publish- ed in Istanbul in the year 1932. The work consisted...
of 276 pages and 124 figures. This work was the abridged second edition of the work Science of Medical Plants: Subjects of Plant Classification. Even though "Cryptogamous Plants" were not mentioned in this work, additional knowledge concerning species and distribution of some of our crop plants, had been given in the section named "Phanerogamous Plants". Most of the figures used in this edition have been extracted from the work of L. Beille called Botanique Pharmaceutique (vol.2, Paris 1909). In this work, the Arabic terms used in the first edition were replaced, to some extent, by their Turkish equivalents. French words for family names were written beside their Turkish equivalents. Likewise, both Latin and French names of plants were written beside their Turkish equivalents. As mentioned in the first edition, the most significant introductory properties, usage and the efficient substance of the species were omitted. Distribution of the plants has not been expressed, but the distribution of a few plants throughout Anatolia, was added.

In his books, Dr. Şeferrutin Tevfik Terenemiz meticulously attempted to write the Latin and French names of the plants beside their Turkish equivalents. He also tried to note the French names for families beside each of their Turkish equivalents, and to write the French equivalents beside several botanical terms and efficient substances. In this manner, his books may also be deemed as a dictionary.

Dr. Erol Şeferrutin Köprüülü and Dr. Şeferrutin Tevfik Terenemiz are two lecturers who taught Botany in Istanbul Darülhaman (University) and wrote, simultaneously, books on Botany which had the same name. The former was a lecturer in the Faculty of Medical Sciences while the latter taught in the Departments of Pharmacy and Dentistry. A third Dr. Şerefeddin has taught Botany in the same period and wrote a book on Botany. Having graduated from the Military Medical School of Istanbul, Dr. Şerefeddin Muğ-

BIBLIOGRAPHY

The Great
Ottoman-Turkish
Civilisation
The Great
Ottoman-Turkish Civilisation
3
PHILOSOPHY, SCIENCE AND INSTITUTIONS

Editor-in-chief
PROF. KEMAL ÇİÇEK

Co-editors
PROF. ERCÜMENT KURAN
PROF. NEJAT GÖYÜNÇ
PROF. İLBER ORTAYLI

Executive editor
GÜLER EREN

YENİ TÜRKİYE
The incredible fact that the Ottoman frontier beylik became an Empire over such a short period of time has attracted many Western researchers and scholars to delve into the history of the Ottoman State. It could be argued that there are miscellaneous determinants and dimensions that actually created the possibility for such an incredible feat to be accomplished. This volume has been edited with the aim of focussing on the main factors that gave rise to such a great civilisation. In the first place, the institutional character of the Ottoman State is of utmost importance. In order to understand the basis of Ottoman civilisation, the different patterns of its institutions should be studied, as the comprehensive analysis of the institutional structure of the Ottoman Empire might enable us to conceive how a small beylik was able to turn into one of the greatest Empires in the world. In this volume, the administrative, judiciary and military institutions of the Empire are set out as the main subject titles. In addition, there are various subjects which have been analysed, under such subrubles as bureaucracy, religion and law, shedding light on the main characteristics of Ottoman institutions.

In appreciation of the highly developed institutional structure of the Ottoman Empire, the ideational and philosophical sources cannot be underrated. Unless these sources are taken into consideration, it is impossible to grasp the various dynamics of Ottoman institutions. Therefore, this volume is entitled “Philosophy, Science and Institutions”, due to the close correlation and importance of these subjects to one another.

Contrary to conventional Euro-centric and Orientalist assumptions, which hold “science” as the peculiar praxis of the Renaissance and Enlightenment in
the West, in this volume it is generally argued that the Ottomans had a number of successes in scientific activities (ılm ı fen). The Ottoman State not only promoted the development of science within the borders of the Empire, but also facilitated several interactions with scientific activities outside of its territories.

During this interaction, it both benefited from and contributed to the scientific improvements made in Europe.

Additionally, this volume dedicates an important place to the development of philosophy and thought in the Ottoman Empire; although in the Ottoman Empire such major philosophical schools as developed in Europe were not formed, rather the Ottomans focused mainly on Islamic philosophy. Yet this situation does not arise from the fact that the Ottomans lagged behind in speculative matters. On the contrary, they were not interested in philosophical issues that were outside the realm of Islamic tradition. From their point of view, Islam encompassed all ontological and epistemological matters, making any other philosophical concern dysfunctional.

Yeni Türkiye

CONTENTS

volume 3

PHILOSOPHY, SCIENCE AND INSTITUTIONS

PART I: PHILOSOPHY

Ottoman Thought Of World Domination

ottoman thought in the classical age

early reforms
AN UNKNOWN ENLIGHTENMENT MOVEMENT IN THE OTTOMAN EMPIRE / ASSOC. PROF. DR. KAZIM SARKAVAK / 77 • MÜTEFİKİKAS PRINTING PRESS: SOME OBSERVATIONS / DR. HİDAYET NURUOĞLU / 83 • SULTAN MAHMUD II AND THE FEZ REVOLUTION / MEHMET LALE / 91

tanzimat: breaking with the tradition

from absolutist monarchy to meşrutiyet
THE COMMITTEE OF THE NEW OTTOMANS AND THE BEGINNING OF THE DEBATE ON THE PARLIAMENTARY SYSTEM IN TURKEY / ASSOC. PROF. DR. AZİM ÖZCAN / 143 • "INTERNATIONALS" WITHIN THE FRAMEWORK OF OTTOMAN CONSTITUTIONALISM / PROF. DR. BÜLENT TANOĞ / 155 • OTTOMAN MODERNIZATION AND TÜMSÜL HAYREDDİN PAŞA / DR. MEHMET ARIF KİREÇÇİ / 162 • SOME NOTES ON THE ROOTS OF TURKISH CONSTITUTIONALISM / DR. ZÜHTÜ AYSLAN / 166
From “Osmanlı” To National Identity
emergence of pan-islamism, pan-turkism and
turkish nationalism
THE OTTOMANS AND THE CALIPHATE / ASSOC. PROF. DR. AZMI ÖZCAN / 181 • CULTURAL AND POLITICAL
PAN-TURKISM / PROF. DR. JAKOB LANDAU / 192 • THE EMERGENCE OF TURKISH NATIONALISM
UNDER THE OTTOMAN EMPIRE / ASTE PROF. DR. YUSUF SARIYAV / 196 • ILLEGAL YOUTH TURKS
PUBLICIST WRITINGS (LATE 19TH-EARLY 20TH CENTURIES) / PROF. DR. YURI A. PETROSYAN / 207

Ottoman Legacy and The Turkish Republic
ottoman legacy
THE OTTOMAN ROOTS OF THE TURKISH REPUBLIC / PROF. DR. BERNARD LEWIS / 221 • MODERN TURKEY
AND THE OTTOMAN LEGACY / PROF. DR. EKMELEDDİN İHSAŞOĞLU / 229 • THE BALKANS AND THE
OTTOMAN INHERITANCE / PROF. DR. İLBER İRTİAYLI / 241 • OTTOMAN LEGACY IN TURKEY /
PROF. DR. ERCÜMENT KURAN / 246 • THE MOST IMPORTANT OTTOMAN INHERITANCE: TURKISH SOCIETY / PROF.
DR. BABAİDIN YAVUZLUOĞLU / 258 • THE ANATOMY OF AN ECONOMIC HERITAGE FROM
THE OTTOMAN STATE TO THE REPUBLIC OF TURKEY / PROF. DR. AHMET GÜNEŞ SAYAR / 253 • ISLAM, THE
TROUBLESOME HERITAGE OF THE OTTOMAN EMPIRE (A TRIAL OF A PROBABLISTIC APPROACH) /
PROF. DR. AHMET YAŞAR OĞAK / 259 • THE SOCIAL CHARACTER OF THE OTTOMANS IN THE PERIOD OF
RECESSIION AND COLLAPSE / DR. YUDIN BİLGİN / 271

current historiography on the ottoman state
THE PLACE OF THE OTTOMANS IN WORLD HISTORY: METHODOLOGICAL QUESTIONS AND A REINTERPRETA-
TION OF OTTOMAN HISTORY / PROF. DR. AHMET İLGI / 281 • ATTITUDES TOWARD THE
OTTOMANS IN EGYPTIAN HISTORIOGRAPHY DURING THE OTTOMAN RULE / PROF. DR. MICHAEL WINTER
/ 289 • THE OTTOMAN LEGACY AND THE COMPLEXITIES OF THE BALKAN HISTORIOGRAPHIES (FORMA-
TION OF MUSLIM BALKAN COMMUNITIES) / ASSOC. PROF. DR. ANTONINA ZHELYAZKOVA / 298

PART II: SCIENCE
An Overview of Ottoman History of Science
AN OVERVIEW OF OTTOMAN SCIENTIFIC ACTIVITIES / PROF. DR. EKMELEDDİN İHSAŞOĞLU / 309 • THE
EVOLUTION OF THE GROCULTURAL SPACE OF OTTOMAN SCIENCE (ITS EXTENSION, DIFFERENTIATION, AND
COLONISATION) / DR. NAGER MILADI / 329 • THE OTTOMAN ULAMA / PROF. DR. MEHMET İPŞİRLİ / 339 • MATEER
NAŞUH: THE FAMOUS KNIGHT, SCIENTIST AND ARTIST OF THE PERIOD OF SÜLEYMAN
THE MAGNIFICENT / PROF. DR. İSAYIN GAZİ YAVUZLUOĞLU / 348 • ISLAMIC SCHOLARSHIP BETWEEN IMPE-
RIAL CENTER AND PROVINCES IN THE 18TH CENTURY: THE CASE OF MÜREDI A-L-ZADEH (D.1200/1791) AND
HIS OTTOMAN CONTACTS / PROF. DR. STEFAN REICHMUTH / 357

Historiography and Geography
THE OTTOMAN HISTORIOGRAPHY / PROF. DR. MEHMET İPŞİRLİ / 369 • ON OTTOMAN HISTORY TEXT-
BOOKS AND REFORM (1839-1918) / DR. BETÜL BAŞARAN-AKPİNÇ / 379 • OTTOMAN STATE AND
AHMET ÇEYKIT PASHA'S HISTORY / PROF. DR. BEŞİR AVDALİ / 389 • GEOGRAPHY IN
THE OTTOMAN EMPIRE / PROF. DR. RAMAZAN ŞİŞEŞ / 405

Mathematics, Astronomy, Biology
MATHEMATICS IN OTTOMAN EMPIRE / PROF. DR. MEHMET Y. DERAN / 413 • DECIMAL TRIGONOMETRIC
TABLES IN THE WORK OF TAKI-YEDİSLİ "CEBİR İL DÜERİ VE HABIR D İ-FİKER" (PREPARATION AND USE) /
ASSOC. PROF. DR. İREM DEMİR / 439 • THE BIRTH AND DEVELOPMENT OF MODERN
BOTANY IN THE OTTOMAN TURKEY / PROF. DR. AHMET BAYTOP / 451

Medical Sciences
THE PLACE AND THE IMPORTANCE OF MISIH ÇARŞI (SPICE BAZAAR) IN OTTOMAN-TURKISH MEDICINE / PROF.
DR. ARŞAĞÇU / PROF. DR. ERDEMİR / 467 • THE OTTOMAN – TURKISH DENTISTRY / PROF. DR. İLTER UZEL / 455 •
THE IMPORTANCE OF PHARMACY AND THE FREE DISPENSATION OF MEDICINES TO THE PUBLIC
WITHIN THE OTTOMAN HEALTH SYSTEM / PROF. DR. MAHMYUN ÇUBUKÇU / 451

Technology
THREE SCIENCES, THREE OPTIONS FOR THE KNOWLEDGE TRANSFER IN THE LATE OTTOMAN TURKEY:
ZOOLOGY, CHEMISTRY, GEOGRAPHY / PROF. DR. KLAUS KREISER / 481 • THE METRIC SYSTEM IN TURKEY /
PROF. DR. FIZA GÜNÇERCU / 487

PART III: INSTITUTIONS
Ottoman Administrative History
ottoman central administration
FROM THE DIVAN-J HUMAYUN (IMPERIAL COUNCIL) TO THE MECÎLİS-İ MÜBÂSAN (HOUSE OF DEPUTIES)
LEGISLATION IN THE OTTOMAN EMPIRE / ASTE PROF. DR. MİHMET V. YEŞİNLİ / 499 • THE
INSTITUTIONS OF THE IMPERIAL COUNCIL (DIVAN-J HUMAYUN) / DR. RECEP AHŞİHALİ / 506

ottoman peripheral organisation
PROVINCIAL ORGANIZATION OF THE OTTOMAN EMPIRE IN PRE-TANZIMAT PERIOD / PROF. DR. MEHMET
GÖYÜNCÜ / 519 • THE ANATOLIAN PROVINCE GENERAL: THE ESTABLISHMENT AND THE HISTORICAL
EVOLUTION / PROF. DR. M. ÇETİN VARLIK / 533 • THE DEVELOPMENT OF THE USE OF "KURŞANT" AS A
GEOGRAPHICAL DESCRIPTION AND THE INCORPORATION OF THIS REGION INTO THE OTTOMAN EMPIRE
IN THE 16TH CENTURY / BAKİ TEZCAN / 548 • THE CONSEQUENCES OF THE WEAKENING OF CENTRALIZED
STATE STRUCTURE: AVÂNLIK SYSTEM AND GREAT DYNASTIES / PROF. DR. YÜCEL ÖZKAYA / 554 • THE AGE
OF ЭЙАНС IN THE HISTORY OF THE OTTOMAN STATE / PROF. DR. ÖZCAN MERT / 565
administrative reforms in the tanzimat period

TANZIMAT / PROF. DR. MUSA ÇADIRCI / 573  ■  MUNICIPAL SERVICES IN THE OTTOMAN EMPIRE BEFORE THE PERIOD OF TANZIMAT (REFORMS) / ASSOC. PROF. DR. İLİSAN YERLİKAYA / 590

the bureaucracy in the ottoman state


Ottoman Legal System

an overview of ottoman legal system


ottoman law and its transformation


Ottoman Military

ottoman military organization, arms, war industry and technology


Ottoman Wakf System


PART I

PHILOSOPHY