



Figure 11.1: *Kandilli Observatory, Istanbul*

11. Two Observatories in Istanbul: from the Late Ottoman Empire to the Young Turkish Republic

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Abstract

From the 17th century onward, the Ottoman Empire entered a phase of weakening, as a consequence of many factors including the dissolution of political stability, the loss of territory and decreasing revenue. In the second half of the 19th century, as an attempt to reinforce power of the central authority, the Ottomans undertook major reforms called *Tanzimat*. During this period, individuals started to establish professional and learned associations similar to those in the West which eventually led to the creation of a Faculty of Science and to the Ottoman University (*Darulfünun*, 1900).

In this context of reform and opening to the West, the Imperial Observatory (*Rasathane-i Amire*) was founded in 1868 with the support of France. Its primary aim was to exchange data between European and Ottoman meteorological stations. The Imperial Observatory occupied several locations before reaching its final setting in Kandilli (1911), on the Asian side of the Bosphorus where other activities were developed such as sismology, astronomy, meteorology and magnetic studies.

Following the spirit of the newly founded Republic in 1923, a serious reform of the academic programmes and a purging of the staff of the Ottoman University led to the establishment of the Istanbul University in the historical quarter of Beyazit (1933). The Istanbul astronomical Observatory was founded in the same year and its construction started in 1935. The university reform was largely influenced by the presence of German and other European scholars, many of them Jewish, escaping from Nazi persecution. In particular, Erwin Finlay-Freundlich from Potsdam Observatory became the first director of Istanbul Observatory.

Kandilli and Istanbul University observatories are briefly presented here, stressing the main steps of their creation and their astronomical heritage.

Introduction

After the demolition of the Istanbul's short lived Imperial observatory in 1580, no other state observatory was founded in the Ottoman Empire before the second half of the 19th century. The old 16th century Istanbul observatory followed a long tradition of astronomical observatories in the Islamic world including the Maragha (1258) and Samarkand (1424) observatories which served as models in the organisation and type of instruments that were used in Istanbul [1]. Despite the absence in the

Ottoman Empire of similar institutions for almost three hundred years, astronomical activity continued mainly within medreses for administrating religious life (determining times of prayer and worship, etc.), and with the appointment of an astrologer dedicated to the Ottoman court called *müneccimbaşlık* (chief astrologer-ship) whose main function was the preparation of calendars, fasting time tables and horoscopes [2]. These activities depending crucially on astronomical tables, the absence of a proper observatory led to the use first of Ulugh Beg's tables and, from the 18th century onwards, to the use of European tables such as those from Cassini or Lalande that had been translated into Turkish [3]. The position of chief astrologer was abolished in 1924 with the foundation of the Turkish Republic.

11.1 Kandilli Observatory

In 1868 Sultan Abdulaziz founded a new institution called *Rasathane-i Amire*, or Imperial Observatory [4]. However, this observatory was not dedicated to astronomy but rather to meteorology. Its creation was strongly influenced by the development in France at that time of an international meteorological network based on the electric telegraph. This had been set up in 1854 by Paris Observatory's director Urbain Le Verrier [5] who succeeded by the 1860's in centralizing daily meteorological data from most European countries. The main aim was the construction of synoptic maps for weather forecasting and storm tracking. Including data from the Ottoman Empire was essential in order to follow the motion of storms from the Atlantic to the Black Sea region and all the way to the Persian Gulf. The creation of the Imperial Observatory of Constantinople was supported by Grand Vizier A'ali Pasha and also by Minister of Public Works Daoud Pasha who was at the head of the administration of the telegraph. Equipped with French instruments [6] and organized by its first director, the Greek-Ottoman Aristide Coumbary (1828–1896) who was following Le Verrier's recommendations, the new observatory quickly became operational. Through this new institution, the Ottoman Empire took part in the *International Meteorological Congress* in Vienna in 1873 which established the rules

of the emerging worldwide meteorological network.

Despite the continuous activity of the Imperial Observatory over the years, observations in Constantinople were made from the director's house in Pera until its destruction by the major 1894 earthquake. From the very beginning of the observatory's existence, several unsuccessful attempts were made to develop astronomical observations with professional equipment. After the 1894 earthquake the erection of a proper observatory with several buildings dedicated to geodynamics, astronomy, meteorology and magnetic studies was planned [7]. However, this project was never achieved and after Coumbary's death in 1896, the Rasathane-i Amire, then led by Salih Zeki (1864–1921), remained until 1909 in Maçka, in a state building where it had been relocated after the 1894 earthquake. During the Young Turks revolution of April 1909, most of the instruments were destroyed. In 1910 Fathin Gökmen (1877–1955) became the new director of the Imperial Observatory. Encouraged by Salih Zeki, in 1911, he provided the institution with a proper observational site and dedicated buildings, including a modern astronomical observatory. The new site was located in Kandilli, on the Asian side of the Bosphorus, on top of a 120 m hill, where original buildings can still be seen today.

In the first years, administrative, meteorological and seismological buildings were erected. In 1918, an equatorial telescope (20 cm diameter and 307 cm focal length) was ordered from the Zeiss Company. It was installed in 1925 and the building housing it was completed in the period 1926–1933 (Fig. 11.1, p. 114). The architectural style of the building reflects the Ottoman revivalist style of the early 20th century. The main astronomical activities were time service and solar physics. Astronomical instruments that remain from this period include naval chronometers, theodolites, electrical clocks, Leroy chronometers, sextants, etc.

Since 1982, Kandilli Observatory has been affiliated to the Bosphorus University and, as an institution, is named *Kandilli Observatory and Earthquake Research Institute*. Besides its site, its various buildings and its astronomical heritage – large instruments, clocks and other scientific instruments and accessories –, Kandilli Observatory hosts in its library a very rich collection of manuscripts. This collection was selected to be one of the ten pilot projects for the *Memory of the world* programme launched by UNESCO in 1992, aiming at the preservation, cataloguing and digitization of more than 1300 astronomical manuscripts written in Turkish, Persian and Arabic. In addition, since 2007, Kandilli Observatory has hosted a museum displaying 16th to 19th century astronomical instruments, as well as equipment and instruments that were used in the observatory.

11.2 Istanbul University Observatory

In the 19th century Ottoman Empire, during the reform period known as Tanzimat, several attempts were

made to establish a new institution of higher education besides medreses. Such an institution was often called *Darulfünun* (“house of the sciences”), which in the late 19th century was considered to be the equivalent of a university. The first Ottoman university was eventually established under the name of *Darulfünun-i Sahane* on 31 August 1900. It was the foundation of present day Turkish universities [8]. In 1933, ten years after the founding of the Turkish Republic, Darulfünun was transformed into the “Istanbul University”. The main consequences were a complete revision of the academic programs and a purging of the staff. The transition was helped by the influx to Turkey of large numbers of German and European scholars, many of them Jewish, fleeing Nazi intimidation or persecution [9]. Indeed, in April 1933, Germany's “Civil Service Law” established that civil servants who were not of “Aryan descent” as well as opponents to the Nazi regime were forced to retire from the civil service (teachers, professors, judges, etc.). Albert Malche, a Swiss professor of pedagogy, was invited in 1932 to come and help with the preparation of a report on the Turkish educational reform. In the same year, persecution of some scientists had already begun. Albert Malche was in contact with pathologist Philipp Schwarz who was among the first to be fired. Schwarz made the link between the new needs of the young Turkish university and European Jewish scholars: in March 1933 he established the “Emergency Assistance Organization for German Scientists” to help Jewish and other persecuted German scholars to find employment in countries accepting such refugees. Recognizing the opportunity, Turkey invited Dr. Schwarz to Ankara. This visit was quickly followed by the arrival in Turkey of 300 academics and 50 technicians who obtained positions both in Istanbul and Ankara Universities. In particular, leading astronomy professors were invited to set up an academic department and an observatory. Among these was Erwin Finlay Freundlich who had to resign from his position in Potsdam. He was offered a position at Istanbul University to launch and lead Turkey's first astronomical laboratory, a position that he kept until 1937.

The observatory was chosen to be located within the university gardens, at the heart of the historical quarters in Beyazit. It was built in 1935 by architect Arif Hikmet Holtay, who had been educated in the Stuttgart Technische Hochschule. At that time, he was also assisting Ernst Egli, Austrian architect at the head of the architectural section of the Academy of Fine Arts in Istanbul (1930–1936). Egli initiated radical changes in Turkish architecture with the introduction of the rationalist and functionalist principles of European modernism [10], well reflected by Holtay's Istanbul University Observatory (Fig. 11.2, p. 117).

The observatory consists of a single building with two domes (the smallest one has been recently destroyed) and a meridian room (the roof of which has been removed) housing all astronomical activities. The main



Figure 11.2: Istanbul University Observatory

instrument is an astrograph (30 cm diameter, 200 cm focal length) that was ordered from Zeiss in 1934 by Freundlich and installed in 1936. It is still operational today. Other main instruments installed in the 1930's include photosphere and chromosphere refractors. An inventory of instruments and archives has now started at the Observatory and since 2008 a room has been allocated to them and equipped for storage.

After Freundlich's departure in 1937, Wolfgang Gleissberg (originally from Breslau University and working with Freundlich in Istanbul) became head of the observatory and remained as such most of the time until 1958. After that, directorship went to Turkish scholars who had been trained by Freundlich and Gleissberg [11]. The Observatory is currently part of the Science Faculty of Istanbul University.

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11.3 Bibliography

- 1 SAYILI, A.: *The Observatory in Islam and its place in the general history of the observatory*. Ankara (1960).
- 2 AYDÜZ, S.: 'Müneccimbaşılık in the Ottoman State.' In: *Osmanlı Bilimi Araştırmaları I* (1995), 6.
- 3 İHSANOĞLU, E.: 'The Introduction of Western Science to the Ottoman World: A Case Study of Modern Astronomy (1660–1860).' In: *Science, technology and learning in the Ottoman Empire: Western influence, local institutions, and the transfer of knowledge*. Ed. by İHSANOĞLU, E.. Aldershot, Hants, England; Burlington, VT: Ashgate Publishing Company (Variorum Collected Studies) 2004.
- 4 DIZER, M.: 'Osmanlıda rasathaneler.' In: *Fatih'ten Günümüze Astronomi, Prof. Dr. Nüzhet Gökdoğan Sempozyumu*. 1993, İ.Ü. Fen fakültesi 1994.
- 5 LE VERRIER, U.-J.: 'Rapport sur l'Observatoire Impérial de Paris et projet d'organisation.' In: *Annales de l'Observatoire Impérial de Paris T1* (1855).
- 6 MARIÉ-DAVY, H.: 'Rapport sur une mission météorologique en Hongrie, en Turquie, en Grèce et en Italie.' In: *Archives des missions scientifiques et*



Figure 11.3: *Construction of the Istanbul University Observatory in 1934*

littéraires, Paris: Ministère de l'Instruction Publique 1868.

- 7 BATUR, A.: 'Rasathane-i Amire binası için 1895 projeleri.' In: *Osmanlı Bilimi Araştırmaları VI* (2005), 2.
- 8 İHSANOĞLU, E.: 'The Genesis of Darulfünun: An Overview of Attempts to Establish the First Ottoman University.' In: *Histoire économique et sociale de l'Empire Ottoman et de la Turquie (1326-1960). Actes du sixième congrès international tenu à Aix-en-Provence*, (Aix-en-Provence, 1-4 juillet 1992), ed. by DANIEL PANZAC. Paris: Peeters (Collection Turcica; VIII) 1995.

- 9 REISMAN, A.: *Turkey's modernization, Refugees from Nazism and Atatürk's Vision*. Washington, D.C.: New Academia Publishing 2006.
- 10 BOZDOĞAN, S.: *Modernism and Nation building, Turkish Architectural Culture in the Early Republic*, University of Washington Press 2001.
- 11 MENTEŞE, H. H.; ESENOĞLU, H. H. AND H. ÇALIŞKAN: *Kuruluşundan Günümüze İ.Ü. Fen fakültesi Astronomi ve Uzay Bilimleri Bölümü 1933-2000*. Istanbul University 2000.



Figure 11.4: Sign of the Imperial Observatory (19th century) now visible at Kandilli observatory