

Miri Shefer-Mossensohn. *Science among the Ottomans: The Cultural Creation and Exchange of Knowledge*. Austin: University of Texas Press, 2015. 262 pages. ISBN: 9781477303597.

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During the last two to three decades, we have observed that studies about Ottoman science have increased in both quantity and quality in Turkey and other countries. There may be many explanations behind this development, but we think that all of them can be summarized under two main points: (1) The earlier miscellaneous pieces of history of science, which were fragmented and unsystematic, are now being compiled and reorganized and (2) these items have spread beyond Turkish academia. The Ottomans' six centuries of experience in science present a rich and untouched research field for Turkish-speaking native and non-native researchers, especially historians. This field also has the potential to reveal some conclusions for the history of science and technology, conclusions that may modify such traditional paradigms as decline-collapse, modernization, and dependency. The book under review, written by Miri Shefer-Mossensohn, an Ottomanist at Tel-Aviv University's Department of Middle Eastern and African History who works mainly on Ottoman medicine and science, seeks to make new contributions to the Ottoman experience in terms of science and technology and to create new perspectives in this field.

Shefer-Mossensohn presents three important theses: (1) An "Ottoman science" does exist, for its idiosyncratic characteristics distinguish it from other contemporaneous scientific systems; (2) as opposed to the Western-centered stereotypical assumption that the Ottomans entered a period of stagnation and then decline, as being isolated and closing their minds to any innovation made after Islam's "golden age," the author argues that the empire's society and culture had prepared a fertile ground for various scientific activities; and (3) Ottoman scientific activities were not necessarily considered ground-breaking enterprises, as we understand "innovation" today. To support this argument, the author conceptualizes their relation to science under the term *generic*,

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which refers to products that are comparable to patented brands in performance, instead of such inadequate concepts as *borrowing or imitation*.

The first chapter is devoted mainly to defining the scientific sources sheltered by the Ottomans for years and the mechanisms used to legitimize them. The author presents the classification of knowledge (*marātib al-'ulūm*) derived from the Ottomans' epistemological criteria as regards theory, practice, religion, and reason. She exemplifies these discussions, especially in the works of Taşköprüzâde and Kâtib Çelebî, thereby underscoring that the existence of this important tradition. Moreover, she situates Ottoman scientific experiences at the center of a Eurasian scientific hub, which is composed of Islamic, Turco-Mongol, Byzantine, Mediterranean, and Western European components, in an attempt to show how the Ottomans had internalized traditions of science coming from various geo-cultural sources.

In chapter two, Shefer-Mossensohn analyzes the social, geographical, religious, professional, and gender characteristics of those scholars involved in knowledge production and dissemination. In this framework, the focus is on the educational institutions, their physical spaces and pedagogy, and professional circles as analytical units participating in the production of science. The author elaborates upon the issue via such notions as madrasa, *mudarris* (professor), *softa*, primary school (*sibyan*), the 'ulamā', the learned class (*ilmiye*), the *ijāza* (diploma), and apprenticeship, as well as education in the imperial palace, the harem, and the Enderun (the palace school). In this regard, he explains the emergence of modern educational institutions within the context of "the long nineteenth century" (p. 78), a borrowed phrase that designates the kind of education provided by these institutions within the context of encounters between new and old, secular and religious, civil and military.

In the third chapter, Shefer-Mossensohn exemplifies how the Ottomans applied the transfer of knowledge – the tool of transmitting knowledge beyond time and space – through human agencies. In this framework, he deals with the processes of exporting and importing knowledge. She devotes a sizable amount of space to literacy, the calligraphic arts, various typefaces, the artistic and bureaucratic institutions involved with producing written documents, the basic characters of edicts and decrees, the production of miniatures, translation movements and translators, and of course the disputes surrounding the printing press. In addition, she refers to some marginal groups who played an important role in this knowledge transfer, such as diplomats, merchants, adventurers, scientists, and convicts, not to mention the Jews, Muslim and Christian Arabs, Armenians, and Greeks.

The fourth and the last chapter presents the relations between the state apparatus and scientific activity by designating the state-controlled infrastructure

projects and patronage. In this respect, the concept of *intisāb* (patron-client relationship) is discussed in the context of *waqf/vakıf* (philanthropic institutions) system. The author delineates the latter's operational mechanism in the fine arts, science, architecture, medicine, and military technology and then provides various examples. She then moves on to the diverse dimensions of the relation between the Ottoman Empire and the scientific and technological infrastructure, especially as regards the development of public buildings, roads, and bridges by citing the famous architect Mimar Sinan (d. 1588). The author, then, jumps into the nineteenth century to compare and analyze what changed or stayed unchanged through the examples of architectural projects, telegraphs, clocks, railroads and trains. The chapter's conclusion states that the nineteenth-century developments and European investments gave birth to a new kind of relationship between scientific-technological activities and the state apparatus. The author does not refrain from questioning whether a "semi-colonial" structure emerged in the empire during the nineteenth century, unlike previous centuries (p. 152).

To conclude the book, Shefer-Mossensohn concretizes her arguments by focusing on two successive figures. The first figure is Murtaḍā al-Zabīdī (1732-90), a famous scholar who was born in India, immigrated to Yemen and then moved to Cairo, where he died during a plague. The author brings two of his works to the fore: *Tāj al-'arūs min jawāhir al-qāmūs*, which deals with the classical Arabic-Muslim philology and lexicography, and *Ithāf al-sāda al-muttaqīn*, his outstanding commentary on al-Ghazali's *Ihyā' al-'ulūm al-dīn*. In addition to these two works, the author asserts that al-Zabīdī was at the center of many social and professional networks, thanks to his linguistic abilities and interest in diverse geographies. Al-Zabīdī had strong relations with Sufi orders and enough prestige to contact provincial and central bureaucracy, military circles, and the imperial palace. The author states that this loyal member of the Ottoman elite combined the various current epistemologies of *kalām*, *ḥadīth*, Islamic mysticism (*taṣawwuf*), and Islamic law (*fiqh*), and also tried to make these religious sciences compatible with the natural and physical sciences.

The second figure is his student 'Abd al-Raḥmān al-Jabartī (1753-1822), an Egyptian scholar who, like his teacher and mentor, stood out as a polymath and with whom he shared similar perceptions of knowledge. His father, a wealthy Ottoman official and scholar, belonged to a leading Egyptian 'ulamā' family originally from Djibouti that had immigrated to Egypt at the beginning of the sixteenth century. Al-Jabartī inherited a considerable amount of property upon his father's death, which enabled him to devote his energy to scientific works and writing. He quickly became famous and developed favorable relations with scholars from various schools of thought. He also got into contact with the 'ulamā' of al-Azhar and the Sufi orders.

The author gives details about al-Jabartī's engagement with knowledge. According to him, al-Jabartī's *'Ajā'ib al-Āthār fī al-Tarājim wa-al-Akhbār* covers the 133 years of Egyptian history from the end of the seventeenth century to Napoleon's 1798 invasion, discusses the collaboration – even the transition – between the religious and rational sciences, and details French science and technology. Al-Jabartī was also interested in mathematics, astronomy, medicine, and even in divination techniques, which were usually grouped altogether as “uncommon sciences” (*al-ulūm al-gharība*) in contemporary Arabic sources. Shefer-Mossensohn further holds that al-Jabartī refers to such French medical practices as “the custom of not burying the deceased close to residential areas and discusses how the French impose quarantines in outbreaks of plague...the burning of clothes worn by deceased people” who died of plague, the prevention of prostitution, and the ventilation of homes (p. 162). Al-Jabartī also mentions some engineering technologies like wind-powered gristmills, paved roads, the French-built libraries of Cairo, laboratories, and the various instruments used to observe and measure.

With reference to the examples of al-Zabidī and al-Jabartī, the author reaches some general conclusions about Ottoman science. In her opinion, this activity occurred in a multilayered, eclectic, and practical manner. This six centuries of experience provided the Ottomans with a close connection to various cultures at the individual, society, and state levels.

Shefer-Mossensohn contends that Ottoman Turkish functioned as a tool of science-making, for its status as the cultural language of the elite forced all scholars who wanted to become known to state officials or acquire patrons to produce work in this language. In addition, social networks and patronage were important organizational factors in scientific activity. The system of *waqf* provided significant opportunities for scholars who, in addition to many other perks, received a salary and allowed to eat in the institution's *'imāret* (soup kitchen).

The author opines that the Ottoman state brought a measure of bureaucratization to scientific activity during the late fifteenth and early sixteenth centuries. The patron-protégé relationship had been personal and intimate; however, under the Ottomans it gradually became institutionalized in the body of the state. Scholars held official posts at court and in the bureaucracy. Some of them occupied themselves with science. For instance, Taqī al-dīn al-Rāsīd held dual hats: chief astrologer at court and at Istanbul observatory.

Science among the Ottomans endeavors to reconstruct the Ottoman conceptualization of “novelty” and its relevance to science and technology by pointing out how innovations migrated back and forth among the empire, Europe, and Asia, alongside almost constant conflict. During the early modern period, the

various channels of knowledge, both to and from the Ottoman realm, were more or less balanced. Starting from the eighteenth century, however, this balance began to change as European sources of knowledge became increasingly influential. Actually, during the seventeenth century the Ottomans displayed an accelerated interest in new medical knowledge, especially in chemical medicine, from Europe. This new medicine (*tıbb-ı jadid*) diverged significantly from the traditional humoral medicine; however, it remained limited to some elite circles.

The eighteenth century was a time of lively discussions among the Ottoman elite in terms of the concepts of innovation, originality, beauty, invention, fresh, original, and imagination appearing in contemporaneous art, especially in poetry, prose, and architecture. These concepts, accepted as the height of good taste in this century, remained current from the end of the eighteenth century. Along with the advance of modernity, involvement with the “new” and refraining from the “old” became something of a fetish in Europe as well. In the nineteenth century, Ottoman discourse gave rise to new expectations, experiences, and possibilities that departed from traditional concepts and points of references. The elites assimilated the new European concepts and the enormous amount of new knowledge, something that had never occurred before. The adoption of the French metric system, as well as the introduction of Singer sewing machines, paved the way for recognizing the need for and legitimacy of new experiences.

According to the author, the Ottomans officially adopted the French metric system in 1869, although they had been familiar with it since the 1830s. This decision, which ended the various age-old traditional weight and measurement methods, caused difficulty in terms of transferring goods and thus challenged commercial activities and hampered the efficient supervision of trade. In fact, the aim was to reduce the margin of error and the ability to operate illegally. But just as happened with the other Tanzimat reforms, its application went awry. For example, both systems were applied by the public and the officials at the same time. The state published official exchange tables to overcome this dicephalic situation. These efforts forced the Ottomans to think in a new way and to express themselves in a new terminology and language until the 1930s, when Atatürk enforced the implementation of the Turkish law of weights and measure.

On the other hand, the Singer sewing machine was produced by an American company that established itself first in Europe and later in the Islamic world. This item was first used in Beirut during the 1860s and then became common throughout the Islamic world. The company’s agents spread throughout the empire in order to introduce branch offices and replacement and repair services. They also developed some credit payment systems. The novel marketing strategy, alongside



the machine's high quality and reliability, enabled the company to enter almost every home. This novelty paved the way for others, such as European-style clothing and footwear, as well as umbrellas.

The author argues that although these two new elements worked differently in Ottoman society, they nevertheless opened up fresh financial horizons and generated new social realities as well as reaffirmed the traditional familial and social hierarchies. The author borrows the term "small technologies" from Uri Kupferschmidt, a category to which the sewing machine belonged (p. 169). This technology was operating in a "democratic" way, for the state did not control the availability of typewriters, cameras, pianos, light bulbs, electrical appliances, and cars. However, the state did impose the metric system. These inventions required a process of familiarization, but then created new personal environments and brought about new social relations and habits. They also drove individuals and groups toward regional and national cooperation. Ottoman scientific experience was a complicated and evolving mosaic whose many different pieces coexisted in harmony, competitiveness, and tension (p. 169).

There are relatively weak points in the book. For example, its title *Science among the Ottomans* leads one to believe that the author will present a widened panorama of science in the empire. But this is not the case, for all it does is provide examples from certain scientific fields in a non-chronological sequence. But even this is good enough, because the book actually explicates the issues of production and knowledge transfer, connects the routes of various cultures, and analyzes the scientist prototype and the sociology of science. Throughout her book, Shefer-Mossensohn employs three interwoven concepts: movements of people, hybrid identities, and the eradication of borders. Her conclusions are used to construct the concept of "Ottoman science," a conceptualization that gives her book an exceptional and important perspective that constitutes its perfect aspect.