Science *among the* Ottomans

The Cultural Creation *&* Exchange *of* Knowledge

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Miri Shefer-Mossensohn

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The Cultural Creation and Exchange of Knowledge

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PREFACE

This book unravels the story of Ottoman scientific endeavors. In 1877, the Ottoman Empire boasted the seventh-longest electric telegraph network in the world. As far as modern communication infrastructure, the Ottomans were among the most advanced nations at the time. Their progressive status is surprising, considering the common Western image of the Ottomans of the nineteenth and early twentieth centuries as backward and impoverished—a view that even many elite Ottomans shared. Yet the portrait uncovered by this volume is one of considerable curiosity and vibrant scientific and technological activity. Indeed, Ottoman society was among those cultures that successfully adopted new technologies and adapted them to their own needs. The Ottomans could also boast scientific independence, successfully producing their own technologies rather than relying on a foreign source for supplying a final product. Granted, the Ottomans could not claim any world-renowned invention or innovation; yet their many scientific and technological abilities sustained a six-hundred-year empire. Their successes (coupled with failures and misunderstandings) were humble, but their story is very human, reflecting universal experiences.

Communicating the full range of scientific and technological activities that occurred in the Ottoman Empire is a task for a competent team of specialized scholars, considering the spatial and temporal breath of Ottoman history. The outcome of their endeavors would be a multivolume work. Hence the scope of this study is limited to experiences with science and technology of Turkish- and Arabic-speaking Ottomans who produced, legitimized, consumed, and altered scientific and technological products. It weaves together teachers and students, patrons and men of science, the students of science and the users of science. The book highlights the numerous Ottomans who were engaged in science and technology as "doers" or "consumers," sometimes on a modest level, thus inte-

grating laypeople as well. Intentionally, the book does not celebrate the outstanding geniuses and major discoveries, as by definition these were few and untypical of their times.

The book puts forward three main arguments. First, an "Ottoman science" did in fact exist, harboring unique features differentiating it from other scientific systems of the time. Planning and organization of the processes of scientific activity are embedded in cultural worldviews and prioritizations that are different in different places. This volume explains the various modes of operation, forms, and formats that made the science and technology conducted within the Ottoman realm indeed uniquely Ottoman.

The second main argument is that Ottoman society and culture were a fertile ground for diverse scientific activity. This contradicts common wisdom that still prevails in many academic and non-academic circles, namely, that after the medieval period's Muslim Golden Age, Muslims shut themselves off from other civilizations. This book on Ottoman science presents a different vista of scientific activity in a Muslim society from the fourteenth century through the beginning of the twentieth century. The assumption that the Ottomans were inherently opposed to inventions and innovations is challenged.

The third, more general argument is that Ottoman scientific activity suggests that excellence and innovation are not necessarily identical to invention as we understand it today, namely, cutting-edge creative breakthroughs. The term *generics*—that is, products that are comparable to patented brands in performance—is very useful here to conceptualize Ottoman preoccupation with science.

Like "my" Ottoman scientists, I too relied on the help and support of so many people. I am glad I am able to repay it by presenting them with this book and acknowledging their support here.

The project originated as a short textbook in Hebrew for a new Open University of Israel course on Ottoman history. I thank Professor Haggai Erlich and Dr. Tal Shuval, who invited me to write it. Drs. Yuval Ben-Bassat and Avi Rubin, who reviewed the textbook for the Open University, were encouraging and helpful.

While working on the textbook version I realized the acute need to write a monograph in English on this topic. For that reason I delved again into the sources. Along the way the manuscript went through a series of major transformations to supply colleagues and students with a book-length discussion of the processes that produced Ottoman science.

I owe a debt to my colleagues at the Department of Middle Eastern

and African History at Tel Aviv University. Professor Uzi Rabi, the departmental chair during the period of writing the monograph, was a constant source of support, morally and materially. He also enabled me to offer seminars on science and technology in the Muslim world that were the beginning of the book. Professor Ehud R. Toledano, head of the Tel Aviv University Program in Ottoman and Turkish Studies, read a preliminary outline. I benefitted from his ideas. Dr. On Barak graciously shared with me his insights into science, technology, and modernization in the Middle East based on his own work on materials and temporality in colonial Egypt and coal in the Middle East; he also carefully read the whole manuscript.

With Dr. Keren Abbou-Hershkovitz, a friend and a colleague, I share an interest in Islamic science. I thank her for numerous discussions on numerous versions of this text. I enjoyed these talks and profited from them. With Dr. Rainer Brömer of İstanbul Üniversity's Tıp Fakültesi, whom I also think of as a friend, I shared many talks on Ottoman science and medicine around the globe: in Oxford, in Heidelberg, and in recent years in Istanbul, in- and outside the Ottoman archives. Dr. Sonja Brentjes of the Max Planck Institute for the History of Science, Berlin, is a very gracious colleague (in addition to being one of the more erudite and meticulous scholars I know). She answered several questions via e-mail and was willing to share her work by facilitating me with copies of publications I could not locate easily. During the conferences of "Translations, Translators, and Converts: Transmission of Knowledge in the Seventeenth Century Ottoman Lands" (Chicago, March 2013) and "Studies of Knowledge in Eurasia and Africa: Issues of Methodology and Future Perspectives" (Berlin, June–July 2014), I benefited from our talks on methodology and sources in history of Islamic science. Professors Tzvi Langermann (of Bar-Ilan University) and Robert Morrison (of Bowdoin College) listened to a description of the book on the shores of the Bosporus. I thank them for their interest and comments.

I would also like to express thanks to my students at TAU in the seminars "Science and Technology in the Muslim World." Together we tested ideas and evidence. Your questions triggered me further.

Along the way I benefitted from opportunities to present vignettes from this work in several conferences and workshops. In February 2008 I presented a paper at the European Social Science History Conference (ESSHC, Lisbon) on German-speaking health officials in the Ottoman Empire that became part of the my discussion on modernization and state involvement in scientific production. In May 2008 I participated in a panel

on medical exchange in premodern Asia, from the Levant to Tibet, at the Annual Conference of Asian Studies in Israel (ASI, Jerusalem). In July 2008 I participated at the Three Societies Meeting dedicated to the theme of "Connecting Disciplines." It was a joint event of the History of Science Society, the British Society for the History of Science, and the Canadian Society for the History and Philosophy of Science. In both conferences I focused on what would become a major theme in this book: the flow of people, techniques, and knowledge East and West. This theme was also discussed in September 2011 in a Tel Aviv University Minerva Humanities Center conference organized by Professor Y. T. Langermann, who leads the working group on the migration of knowledge in the eastern Mediterranean during the late medieval and early modern periods. The most recent venue, in September 2012, was the fourth international conference of the Mediterranean World, "Domino Effects and Hybridization of the Mediterranean," held at 29 Mayıs Üniversitesi, Üskudar, Istanbul. In March 2013 I presented a paper on Ottoman translators within the framework of the University of Chicago symposium "Translation, Translators, and Converts: Transmission of Knowledge in the Seventeenth Century Ottoman Lands." A month later, in April 2013, I presented the sketches of what would become the first chapter on the categorization of knowledge in the framework of the research seminar of the Tel Aviv University Department of Arabic and Islamic Studies. In June 2014 I presented the main arguments of the book in the annual conference of the Middle East and Islamic Studies Association of Israel. I am grateful to the conveners and the participants for an engaging and fruitful dialogue.

Ms. Irena Fliter, Ms. Jennifer Poliakov, and Mr. Ido Ben-Ami, my research assistants and doctoral students, helped me in various ways in preparing this manuscript. Special warm thanks are due to Mr. Liran Yadgar, my previous research assistant, now completing his doctoral project at the University of Chicago. Liran was enthusiastic and helpful in assisting me to locate materials from abroad. I thank them for their dedication and willingness to devote time and energy on my behalf. Mrs. Hephzibah Levin, Shany Orian, and Judith Yacov took care of the linguistic/editorial aspect of the text. At the University of Texas Press I found experts who guided me through the editorial and production process. I thank Jim Burr and Alexis Mills wholeheartedly. I am indebted to Bill Nelson for producing the map.

I am happy to acknowledge the generous financial support from various institutions that allowed me to conduct my research and then write it up: the Israel Science Foundation (Grant #182/11); the Deutsch-Israelische

Stiftung für Wissenschaftlische Forschung und Entwicklung [GIF]—a GIF Young Scientist Grant (Grant #2172-1760.4/200); and the Department of Middle Eastern and African History.

Finally, I would like to mention my family. I especially think of my late father, Dr. Michael Shefer. He was able to see my first two books, and I am sure he would have been happy and proud to see a third. I dedicate this book to my younger daughter, Daphna. The first months after birth were not easy for her medically. Some of the insights brought here regarding the interface of knowledge, professional groups, and institutions were gathered as we spent much time with her in hospitals.

A NOTE ON TRANSLITERATION

The problem of transliteration in Ottoman studies is complicated because of the very broad geographical, cultural, and linguistic scope of the subject matter. Spreading over three continents for six hundred years, the Ottoman Empire was inhabited by members of many linguistic groups living alongside each other, including—in addition to speakers of Turkic dialects—users of Serbo-Croat, Berber, Hebrew, Arabic, Persian, Kurdish, and many more. Moreover, Ottoman society and culture enabled, indeed encouraged, routine crossing of language and cultural boundaries. The result was cultural mixtures and diversities. Such realties are hard to capture, and any single system of transliteration is found lacking either grammatically, phonetically, or aesthetically.

I chose a compromise that allowed me to achieve consistency as much as possible while emphasizing the theme of cultural diversity with regard to Ottoman scientific and technological realities of the early modern period and accurately reflecting the languages of the sources utilized here, which are mainly Ottoman Turkish and Arabic. In addition I tried to simplify forms as much as possible to make the text accessible to historians of science who are nonspecialists in Middle Eastern studies.

Throughout the book I make the case of the high level of Ottomanness of science in the Middle East of the Ottoman era, 1300–1922. With the Ottoman context in mind, I find it appropriate to write most terms and names of places and individuals in Ottoman Turkish forms. For the sake of simplicity, I rendered such terms and names in a modern Turkish form rather than following formal transliteration tables of Ottoman Turkish. In modern Turkish, *c* is pronounced as *j* in English, *ç* as *ch*, and ğ is unvocalized and lengthens the preceding vowel; ı (undotted i) sounds like *u* in the word *turn*; and ş is pronounced like *sh*.

At the same time, I give ample room to provincial-cultural variations, recognizing the Arab character of the Ottoman-Arab provinces. Therefore

in cases where the context is Arabic-speaking, I have used Arabic forms. I also used Arabic forms in the context of the Islamic character of the region. Here the Arabic form expresses a universal component.

This dual system of transliterations allows me to make a distinction, for example, between *ülema*, scholars of religion in a Turkish-speaking site, and their colleagues in an Arabic environment, who are *ʿulamāʾ*. I write about *medrese*s and *vakıf*s, but discuss also endowments in Arabic-speaking environments and refer to them as *waqf*s. I refer to such Ottoman scholars as Ahmed bin Mustafa Taşköprüzade, who wrote much in Arabic but functioned in the context of sixteenth-century Ottoman bureaucracy. However, I also discuss Ottoman physicians such as Ṣāliḥ b. Naṣrallāh Ibn Sallūm, the seventeenth-century physician from Aleppo who rose to be the imperial head physician but still wrote only in Arabic.

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