

An Ottoman Physician and His Social and Intellectual Milieu: The Case of Salih bin Nasrallah Ibn Sallum¹

Salih bin Nasrallah Ibn Sallum (died 1670) is a celebrated figure of seventeenth century Ottoman history. This Arab physician from Aleppo became the head physician (*hekimbaşı*) of the Ottoman Empire and an intimate of the Sultan Mehmet IV (reigned 1648-87). Ibn Sallum was well-known in his time and is mentioned in contemporary chronicles and biographical dictionaries. Modern scholarship too is very familiar with his career and medical output as he is considered a crucial link in the introduction of Renaissance medicine to the Middle East. Ibn Sallum is referred to in standard works on the history of Muslim science and medicine after the Middle Ages and received attention from scholars of Ottoman medicine and science.

Remarks by scholars during the first half of the twentieth century about Ibn Sallum's success at the Ottoman court and his interest

1. An early version of this paper, "Ibn Sallum: A 17th Century Physician Bridging over Arab, Ottoman and European Medicines," was read in *MESA 2003* (Anchorage, Alaska). I thank my co-panelists, Sonja Brentjes, Peter C. Mentzel and Anrás Riedlmayer, and the audience. Parts of this paper were researched while I was a Visiting Scholar at the The Skilliter Centre for Ottoman Studies, Newnham College, Cambridge University (2001) and a Fellow of the Princeton University Library (2002). I thank their hospitality and financial support. I wish to thank also my research assistants, Mr. Tomer Miron and Mr. Liran Yadgar.

in European medicine almost reached the level of common-place wisdom. This historiographical situation may have caused later generations of scholars to regard a study of him as redundant. As a result (only) one image of Ibn Sallum is reproduced, with almost no variants or new insights into his career and medical writings. Ibn Sallum is an example of the state-of-the-art of the history of Ottoman medicine which is still characterized by a rather static discourse. Ibn Sallum represents the scholarship of a period that looked for heroes in its quest for progress in the form of westernization and modernization. This was the sole context in which Ibn Sallum was appreciated.²

While it is true that other Ottoman figures of Ibn Sallum's time, some of whom will be mentioned later, were 'frozen' too in the scholarship, and only recently have been revisited, Ibn Sallum – being a physician – more than others is an exciting example as a focus for a fresh outlook at Ottoman society of the seventeenth century. This article presents an alternative picture of Ibn Sallum's career and medical writings. Rather than presenting him as a physician-scientist-thinker whose genius and originality made him stand out and tower over his contemporaries, I would like to portray him less as a 'hero' and more as a product of his times. While the former narrative tends to glorify one person, it does a disservice to our understanding of the fuller picture of medicine, theory and epistemology in that period. The alternative presentation does not diminish Ibn Sallum's importance, and it gives a fuller picture of his activities against the background of other complex intellectual and

2. See, for example, Abdülhâk Adivar [Adnan], *Osmanlı Türklerinde İlim* (5. basım; İstanbul, 1991), 131-132; Manfred Ullmann, *Islamic Medicine* (Edinburgh: Edinburgh University Press, 1978), 49-51; Esin Kâhya and Aysegül D. Erdemir, *Bilimin Işığında Osmanlıdan Cumhuriyete Tıp ve Sağlık Kurumları* (Ankara: Türkiye Diyanet Vakfı Yayınları, 2000), 179-84; For a slightly different outlook see Peter E. Pormann and Emilie Savage-Smith, *Medieval Islamic Medicine* (The New Edinburgh Islamic Surveys; Edinburgh: Edinburgh University Press, 2007), 171. I analyzed the historiography of Ottoman medicine in "A Tale of Two Discourses: The Historiography of Ottoman-Muslim Medicine," *Social History of Medicine*, forthcoming.

cultural shifts occurring in this period. After all, medicine is intimately linked to so many other aspects of intellectual and social life whereas the common picture of his work has been of disjunction with its surroundings.

Scientific activity carries universal characteristics, but it occurs in particular contexts. This is especially true for medicine. Unlike other spheres of scientific activity, medicine has clinical applications and as a result embedded in society and culture. Medicine does not evolve on its own, separated from other trends in Ottoman society. Rather “medicine is and was an intimate part of the intellectual, social and political life of any period; medicine was very much the product of its time.”³ Medicine is inherently integrative. It is based on knowledge and understanding of nature. It marries philosophy and theology with science and is connected with the life cycle. It is also a social activity which involves several institutions crucial for the well-being of individuals and society. The specific characteristics of the middle and second half of the seventeenth centuries of medicine in and around the Ottoman court were the background in which Ibn Sallum, the man and his work, originated. Thus far this intellectual and social climate in which Ibn Sallum worked has been ignored.

I point out to intellectual similarities between Ibn Sallum and other leading Ottoman scholars of the time: the surgeon Shams-ül-Din Itaki, clerk and scholar Katip Çelebi, and the traveller Evliya Çelebi. I suggest that when several people, each of them typical of his period and social/cultural milieu, share similar views regarding sources of knowledge, than avid interest in new information is more than an eccentricity despite the brilliance and originality of the individuals involved, but a collective intellectual pattern. Instead of arguing how one set of ideas lead to another, or celebrate the genius of an intellectual individual, I focus on the intellectual

3. Here I follow A. Wear, R.K. French and I.M. Lonie, *The Medical Renaissance of the Sixteenth Century* (Cambridge: Cambridge University Press, 1985), “Introduction”, ix.

group in which Ibn Sallum was located. Following Randall Collins,⁴ I see social-intellectual networks (formal or informal) as the fertile ground which begets ideas. True, creative intellectuals are generally introverts who work alone. But together these loners make up forces which shape intellectual processes that take place in one's mind.

What is intended in this article is a portrait of Ibn Sallum as a product of his intellectual times, rather than an indication of future and unforeseen trends, and by focusing on him learn about some aspects of Ottoman mentalities. I am interested in positioning Ibn Sallum within an Ottoman context rather than as a link between the Ottoman world and Europe. In other words, my interest is not in reconstructing lines of transmission of scientific thought between Europe and the Ottoman Empire or study the interaction between European and Ottoman thoughts and scholars,⁵ rather how this scientific thought was applicable in an Ottoman context and understanding what it tells us on Ottoman intellectual horizons of the seventeenth century. Ibn Sallum's ideas were not of a singular outstanding intellectual but a typical Ottoman way of thinking at the time. It will be apparent that the 'novelty' ascribed to Ibn Sallum, namely his interest in European medicine, was in fact neither such a novelty, nor interest in things European. Translation of new knowledge was a trait shared with other Ottoman literati of Ibn Sallum's time, for whom new information rather than its origin (European-Christian or other) was the alluring attribute. Furthermore, like other intellectuals of his social milieu who took over new ideas and information from Europe, Ibn Sallum's way of thinking remained thoroughly Ottoman.

4. Randall Collins, *The Sociology of Philosophies: A Global Theory of Intellectual Change* (Cambridge, Mass.: Harvard University Press, 1998).

5. Recently it was Avner Ben-Zaken, who took upon himself to explore intellectual and social interactions among Ottoman and European scholars. See, for example, his "The Heavens of the Sky and the Heavens of the Heart: The Ottoman Cultural Context for the Introduction of Post-Copernican Astronomy," *British Journal for the History of Science*, 37 (2004), 1-28.

I. THE BIOGRAPHY OF SALIH BIN NASRALLAH IBN SALLUM

Salih bin Nasrallah, known as Ibn Sallum, was a native of Aleppo where he studied logic, at which he excelled. When his interest in medicine became strong he switched subjects. He studied with the best in his hometown but soon surpassed them and acquired the position of head-physician in Aleppo. He was also known to have a pleasant voice and to have mastered music.

Interestingly enough, unlike many other physicians in the early modern period, Ibn Sallum did not study Muslim religious sciences. Many a biography of medical doctors in the relevant period attest that Muslim religious knowledge (Qur'an, hadith, legal thought) occupied a central place in the curricula of Ottoman physicians belonging to the same medical system as Ibn Sallum, namely Muslim humoralism (other medical systems existed in the Ottoman Empire: folkloristic and religious, so called 'Prophetic Medicine', but the system that enjoyed greater elite patronage was humoralism).⁶ Could Ibn Sallum have been of Christian background and his biographers, and the Damascene biographer al-Muhibbi (d. 1699),⁷ and the Ottoman historian, poet and bureaucrat Mehmed Rashed (d. 1735),⁸ omitted the detail of his conversion?

Ibn Sallum knew Latin (he made several statements in his writings concerning this), although he probably did not know any other European language. The circumstances in which he acquired the language are unclear, but one possible source could have been contacts with Catholic missions active in Aleppo and Damascus of the

6. Doris Behrens-Abouseif, "The Image of the Physician, Arab Biographies of the Post-Classical Age," *Der Islam*, 66 (1989), 331-343 based her claim on reading biographical dictionaries in Arabic. I can substantiate her thesis based on biographical dictionaries in Ottoman-Turkish.

7. On al-Muhibbi, a scion of a family of scholars and jurists in Damascus of the sixteenth and seventeenth centuries, see C. Brockelmann, "Al-Muhibbi," *EP*, 7:496-470 (section 3).

8. Christine Woodhead, "Rāshīd, Mehmed," *EP*, 8:440-441.

seventeenth century.⁹ Yet, the omission of such an important piece of information like conversion to Islam is curious, as one would expect the Muslim authors to have exploited this story as a sign of the truth and greatness of Islam. It was done in another case, that of a sixteenth-century Christian by the name of Ishak al-Rumi al-Tabib. His name indicates that Ishak was an Anatolian physician. During his medical studies, which included philosophy and logic, Ishak came to accept the truth of Islam. He embraced Islam, left medicine and started to study Abu Hamid Muhammad al-Ghazali (d. 1111) and Fakhr al-Din al-Razi (d. 1209), two of the most celebrated and original religious thinkers of Islam. Ishak distinguished himself in composing a treatise on Abu Hanifa's legal theory. Two biographical dictionaries, one written in Ottoman Turkish in the center of the Ottoman Empire and another in Arabic in Syria, include Ishak in a short list of distinguished physicians of his time. His conversion is the main theme in the short biographical notes, and it may be this was the reason why this particular individual was included in the selection of elite religious and medical scholars deserving to be commemorated.¹⁰ With regard to Ibn Sallum, casting doubt on his religious background is as yet a subject for speculation.

Ibn Sallum had already made a name for himself in Aleppo where he became chief of physicians before he immigrated to Istanbul, where he excelled too. He mixed in elite circles and was very popular due to his good nature, his conversational skills, and his literary abilities in poetry and story telling. Ibn Sallum rose to great-

9. Emilie Savage-Smith, "Drug Therapy of Eye Disease in Seventeenth-Century Islamic Medicine: The Influence of the "New Chemistry" of the Paracelsians," *Pharmacy in History*, 1 (1987), 4.

10. Ahmad b. Mustafa Ta köprüzade (d. 1561), *al-Shaqa'iq al-nūmaniyya fi ulama al-dawla al-uthmaniyya* (unpublished manuscript held at the Süleymaniye Library, Istanbul; ms. Esat Efendi 2308), ff. 208v-209r; Abd al-Hayy b. Ahmad Ibn 'Imad (d. 1679), *Shadharat al-dhahab fi akhbar man dhahab* (al-Qahira, 1391A.H.), 8:281. For another case of a non-Muslim physician, Nuh b. Abdülmennan (d. 1707), this time of possible Jewish descent, who converted before he rose to the post of Imperial Head Physician see Adivar, *Osmanlı Türklerinde İlim*, p. 163.

ness at the Ottoman court, and was nominated head physician with the paying rank of a judge (kadi) in the capital. His medical treatise brought him much fame and contemporaries lauded and praised him. The narrative al-Muhibbi weaves is certainly a dramatic story that fits the topos 'from rags to riches' that characterized Muslim biographical dictionaries.¹¹

Ibn Sallum's famous tract on therapy and hygiene was called *Ghayat al-itqan fi tadbir badan al-insan* (or: *The Greatest Thoroughness in Treatment of the Human Body*). Shortly after the appearance of the Arabic work it was translated into Ottoman Turkish by leading Ottoman physicians, hence the existence of *Nuzhat al-abdan fi tarjamat ghayat al-itqan* (or: *The Beauty of the Bodies in the Translation of Ghayat al-Itqan*). There was yet another title for the Ottoman translation, as an Ottoman manuscript kept at the Cambridge University Library bears a slightly different title: *Ghayat al-bayan fi tadbir badan al-insan* (or: *The Greatest Explanation in Treatment of the Human Body*).¹²

Ibn Sallum's writings enjoyed considerable popularity. Some of his ideas were also translated into Persian,¹³ but it is the Ottoman context in which he operated. Ibn Sallum presented his works to the Sultan, who rewarded him with a fur coat.¹⁴ Investiture, here in the form of presentation of a fine garment by a ruler to a subject

11. Muhammad Amin b. Fadlallah al-Muhibbi, *Tarikh Khulasat al-Athar fi A'yan al-Mi'a al-Hadiya Ashara* (4 vols; Egypt, 1284H), 2:240-242; Muhammad b. Mustafa Rashed, *Tarih-i Rashed* (6 vols; Istanbul, 1282H), 1:96, 164. See also Adıvar, *Osmanlı Türklerinde İlim* (5. basım; İstanbul, 1991), 122-123, 131-132; Esin Kâhya and Aysegül D. Erdemir, *Bilimin Işığında Osmanlıdan Cumhuriyete Tıp ve Sağlık Kurumları* (Ankara, 2000), 179-184.

12. *Ghayat al-Bayan fi Tadbir Badan al-Insan* (Manuscript held at the Cambridge University Library, Brown P.27), f.4b.

13. See, for example, two manuscripts in Cambridge University Library from the first half of the nineteenth century: Edward G. Browne, *A Supplementary Hand-List of the Muhammadan Manuscripts including all those Written in the Arabic Character, Preserved in the Libraries of the University and Colleges of Cambridge* (Cambridge, 1922), 169.

14. *Tarih-i Rashed*, 1:96.

in a formal ceremony before an audience, was a customary way in the Muslim Middle East as in many other societies of singling out a favourite and bestowing distinction upon him.¹⁵ His treatises were copied time and again, both in Arabic and in Ottoman (many of them still exist in libraries in Turkey and elsewhere).

II. IBN SALLUM AND NEW MEDICINE

Ibn Sallum studied not only Arab-Muslim medicine but Renaissance European physicians as well. He described several 'new' types of sickness, including scurvy and anemia, in Arabic for the first time, like scurvy and anemia. In particular he was acquainted with the writings of the German-speaking physician Paracelsus (Philippus Aureolus Theophrastus Bombastus von Hohenheim, d. 1541), or Barākilsūs in Arabic spelling. Ibn Sallum acknowledged his debt to Paracelsus, and the fourth and last section in his treatise, dealing with the new medicine, was aptly entitled *al-Tibb al-jadid al-kimyawi aladhi ikhtara'ahu barakilsus* ("The New Chemical Medicine which Paracelsus Invented").¹⁶ Ibn Sallum indeed uses in this section (as in some other places in the manuscript) drug therapy (rather than botanicals as in previous sections). To the question whether drugs are deadly he answers by claiming their effectiveness in changing one's balance. Ibn Sallum adds that Socrates was poisoned after all by plants, rather than drugs.¹⁷ As an aside, it will be added here

15. N.A. Stillman, "Khil'ā," *Encyclopaedia of Islam*, 2nd ed. [EP], 5:6-7; Stewart Gordon, ed. *Robes and Honor: The Medieval World of Investiture* (New York: Palgrave, 2001).

16. Some manuscripts contain this section on its own, although a detailed study has yet to be carried out to determine whether they are indeed the work of the same author, independent studies or a section within the encyclopedia, or otherwise wrong ascription of either contemporaries who wished to lay claim to borrowed laurels or later cataloguers who assumed it belonged to a more famous writer.

17. *Ghayat al-itqan fi tadbir badan al-insan* (manuscript held at the Cambridge University Library, Add. 3532), f. 274r.

that the 'new' Ottoman knowledge lagged behind: by the time it was absorbed by Ottomans it was a century old in Europe. Chemical medicine was not 'the medical cutting edge' anymore.

Paracelsus was a controversial physician as he departed from the common wisdom of his time. The high level of antagonism he aroused in the sixteenth century medical establishment that banished him attests to that. Paracelsus was contemptuous of traditional medicine, as will be discussed further down, including criticizing Galen himself. Paracelsus claimed that the Four Elements – earth, fire, water and air – are not the last irreducible elements of matter, but composite bodies in themselves. Each is a mixture of the Three Principles: sulphur, salt and mercury, of which all bodies consist. Second, Paracelsus started a reform in medicine (and in theology) in Renaissance Europe during the sixteenth century which viewed the processes in the human body as chemical in nature. He was the first to treat his patients with chemical medications which included poisonous ingredients. He is thus seen by his supporters as the founder of chemotherapy and biochemistry. This type of therapeutics was clearly far removed from the humanistic botanical tradition that stood at the root of Muslim(-Ottoman) medical theory and practice.¹⁸ The change in therapy was not the only one. On a more profound level, the rejection of Galenic humoral explanations brought new concepts of disease.

Ibn Sallum was familiar with three of Paracelsus' followers: Johann Jacob Wecker (d. 1586) who wrote also on alchemy; Oswald Croll (d. 1609), a professor of medicine at Marburg and a personal physician to Rudolph II von Habsburg; and Daniel Sennert (d. 1637), a professor of medicine at Wittenberg in 1602 who tried to blend humoralism with Paracelsan notions. Several studies have established that "The New Chemical Medicine Invented by

18. For an introduction to Paracelsus thought, see Walter Pagel, *Paracelsus: An Introduction to Philosophical Medicine in the Era of the Renaissance* (2nd & rev. edition; Basel and New York, 1982). Further discussion with more references can be found in footnote ????.

Paracelsus” were translation (usually shortened) into Arabic from these three physicians’ tracts.¹⁹

While most previous studies of Ibn Sallum emphasized his chemical-medical work, Ibn Sallum’s main medical writing stayed well within the traditional medical system of the Ottoman elite, namely Galenic humoralism inherited from Antiquity and adapted, corrected and expanded by many generations of Muslim physicians. A careful study of Ibn Sallum’s therapeutic methods reveals that, as Emilie Savage-Smith has shown with regard to Ibn Sallum’s treatment of eye disease. She established how Ibn Sallum’s versions of various recipes for eye conditions like trachoma, cataract, ptergiyum and pannus, correspond with slight changes with that found in Paracelsian treatises in Latin of Oswald Croll and Daniel Sennert. These recipes include New World or European plants new to Muslim material medica, the reintroduction of other herbs that fell out of use, and distinctly Paracelsian chemical remedies. Ibn Sallum also emphasized to a much greater extent than previous literatures methods of chemical preparations, like distillation and others. Yet, although Ibn Sallum was interested in Paracelsian drug therapy, he did not incorporate surgical practices discussed in his sources in length, claiming such intervention is the expertise of others. Moreover, his theoretical considerations of the causes and symptoms of these eye diseases were drawn from earlier Muslim physicians (ironically, some of the more classical figures, like tenth century Rhazes and eleventh century Avicenna were, known to him indirectly only, through his European sources). The result is that his encyclopedia is a cut-and-paste composition, producing late medieval Muslim medical theory with early modern European chemical medicine in clinical practices.²⁰ Ibn Sallum’s openness to European knowledge was rather restricted. Although he did

19. Savage-Smith, “Drug Therapy of Eye Disease in Seventeenth-Century Islamic Medicine,” 3-28.

20. Savage-Smith, “Drug Therapy of Eye Disease in Seventeenth-Century Islamic Medicine,” 3-28.

borrow certain medical ideas, he rejected (or did not grasp) the more profound changes at the basis of the new chemical medicine. Or more accurately: European knowledge was received and deciphered through Ottoman filters.

To what extent did Ibn Sallum present a real change in Ottoman medical realities? The new chemical medicine had no real impact on clinical realities. Ibn Sallum's writings reflect a change in the intellectual attitudes of some Ottomans toward the human body. This shift was not accompanied by an actual change in physical therapy. Even before Ibn Sallum no less than 50 inorganic compounds were discussed in Ottoman medical treatises. They were actually used and the trade in them left a paper trail. The vast majority of these substances had to be imported, mainly from England and Venice (only raw metals were obtained from the Anatolian ores), and these business transactions appear in trade records. Furthermore, *narh* lists (official lists that set a market price for various items regulated by the authorities) from the first half of the seventeenth century mention inorganic materials like tin, salt, copper, sulfur and others. The lists are quite short: no more than eighteen drugs are mentioned, but these are only the more often sold ones which price had to be regulated. The very fact inorganic substances are included in *narh* lists attests to their having an active market even before Ibn Sallum. At the same time, Ibn Sallum did present a milestone. A comparative study of the Ottoman inorganic drugs before the seventeenth century and afterwards reveals a change in influence. Before the seventeenth century Ottoman pharmacopoeias were greatly influenced by medieval Muslim medicine, whereas those written later, at the end of the seventeenth century and particularly in the eighteenth century, reflect European influence, Paracelsan and other.²¹

It is clear that Ibn Sallum's writings were popular and inspiring for a small social and intellectual elite. Yet the real effect on

21. Feza Günergün, *14-17. Yüzyıllarda Osmanlı İmparatorluğunda Kullanılan Anorganik İlaçlar* (Istanbul, 1986), 6, 49-52.

therapeutics, even for those who appreciated the unique ideas put forward by Ibn Sallum, was limited. The actual medical treatment received by the patients in Topkapı, the Ottoman imperial palace, where Ibn Sallum enjoyed his patronage, continued to be based on traditional botanical pharmacology. This is evident from dozens of prescriptions made out by physicians and apothecaries for members of the Ottoman dynasty and high-ranking officials in the palace from the late seventeenth and eighteenth centuries.²²

Ibn Sallum's fame was to his new medicine, but most of his writings are standard. References to Paracelsus and other European physicians appear throughout his medical compendia *Ghayat al-itqan* and its Ottoman version *Ghayat al-abdan*, but the number of such references is quite negligible in the long treatise (almost 300 folios, varying from one version to another, depending on the copyist, etc). The treatise that is devoted solely to the "New Medicine", 60 plus folios long,²³ is much longer than the scattered discussion of Paracelsian medicine included in the general encyclopaedic treatises. This treatise reveals much heavier Paracelsian influence. In the beginning the author denounces the practice of people in his age who regard chemistry and those working in it as performing shameful deeds, whereas the aim of this branch of knowledge is to study the composition and quality of materials which can assist man's health (f. 3r). In Paracelsian manner he regards humans as a mixture of the Three Principles: sulphur, salt and mercury, instead of the Four Elements (f. 4v). The manuscript also includes on the margins an image of an apparatus made of tubes used in a chemical process of sublimation (f. 36v). The emphasis in *Ghayat al-itqan* and *Ghayat al-bayan* is distinctly different. The first part of the medical compendia clearly situates it within the Ottoman hu-

22. Topkapı Sarayı Müzesi Arşivi, evrak, 93/1-2, 2657/1-5, 11942/7-11, 13-16, 18, 25, 28, 30-33, 37, 41, 43-46, 48, 56, 60, 66, 67-69, 71, 73, 75, 78-82, 85, 87-90, 92, 96-98, 102-105, 112, 118, 122-125, 127-128, 131.

23. See, for example, Add. 266¹(8), a manuscript held at the Cambridge University Library.

moral tradition. Ibn Sallum explains here the familiar concepts of humoral balance. He includes a long list of simple and compound medications that should be taken from the weakest to the stronger doses, as befits the Muslim-Galenic hierarchy of treatment. Not only in its contents but also in the organization of the materials, Ibn Sallum followed here the structural norms of the genre of humoral medical compendia.

Ibn Sallum refers to the sources of his new medical knowledge and acknowledges their novelty. However, Ibn Sallum does not publicly deal with the theoretical concepts that make this knowledge new. During the sixteenth century Paracelsian medicine was very much at the heart of philosophical and theological controversies in Renaissance Europe. Paracelsus was active during the formative phase of the Reformation and entertained iconoclastic aspirations (subsequently he was caricatured as the Luther of medicine). Paracelsus attacked the traditional university type of medicine on several fronts. He opposed the traditional authority of Galen. Paracelsus taught that experience and empiricism rather than logic and reasoning produce real and true knowledge in medicine. He wanted to replace books and bookish learning with oral knowledge (craft wisdom) and secret half-forbidden practices (alchemy and magic), and have them included in the European literary culture. His writings reveal a synthesis of science with folklore, deep spiritualism and belief in demons. Paracelsus integrated careful observation with religion and magic, the keys with which a physician should function. For him, the ability to heal was inborn; medicine was not an acquired knowledge and profession.²⁴

24. Charles Webster, "Alchemical and Paracelsian Medicine," in *idem*, *Health, Medicine and Mortality in the Sixteenth Century* (Cambridge: Cambridge University Press, 1979), 301-334; *idem*, *From Paracelsus to Newton: Magic and the Making of Modern Science* (Cambridge: Cambridge University Press, 1982); *idem*, "Paracelsus and Demons: Science as a Synthesis of Popular Belief," in *Scienze Credenze Occulte Livelli di Cultura* (Firenze: L. S. Olschki, 1982), 3-20; *idem*, "Paracelsus Confronts the Saints: Miracles, Healing and the Secularization of Magic," *Social History of Medicine*, 8 (1995), 403-421; *idem*, "Bare Heads

Ibn Sallum is silent on all these points. Did he know about the wider alchemical revolution? To what extent did he understand the depth of the Paracelsian epistemological controversy? Did he care? Was his silence due to ignorance, oversight, or maybe intentional, side-passing the thorny problem of legitimacy of knowledge so as not to create too much controversy in his Ottoman society? We do not have answers to these important questions, but we know this: In his *Ghayat al-itqan* Ibn Sallum presents the traditional progressive model of learning starting with the Greeks, in which each generation advances former knowledge.²⁵ He did rely on new ideas from European medicine but it is as if he reduced it to pieces of practical information isolated from their epistemological context. It seems Ibn Sallum tried to incorporate the new knowledge into this model rather than presenting it as a major break from traditional modes of learning. In this manner the new knowledge and techniques are described in a functional manner of what and how they can help sick human beings. In sum, Ibn Sallum demonstrates both evolutionary and revolutionary concepts of knowledge and learning.

III. A MAN OF HIS AGE: THE INTELLECTUAL MILIEU

Ibn Sallum was not necessarily out of sync with his contemporaries in looking for new information in general or locating it in Europe. He was a member of a milieu for whom interest in new knowledge, including Western, was an intellectual possibility. Ibn Sallum worked within a cultural space that enabled him to look to Europe for new knowledge. In looking westward Ibn Sallum

against Red Hats: A Portrait of Paracelsus,” in Kurtz Bayertz and Roy Porter, eds. *From Physico-Theology to Bio-Technology: Essays in the Social and Cultural History of Biosciences -- A Festschrift to Mikuláš Teich* (Amsterdam, 1998), 54-75; *idem.*, “Paracelsus, Paracelsianism, and the Secularization of the Worldview,” *Science in Context*, 15 (2002), 9-27.

25. *Ghayat al-itqan fi tadbir badan al-insan* (manuscript held at the Cambridge University Library, Add. 3532), f. 10v.

positioned himself as part of a small group of Ottoman scholars, and while this group may have been a minority, a cluster (to borrow Randall Collins' term²⁶) of scholars in various branches of knowledge incorporating western knowledge into their Ottoman sphere did exist.

Here I present three seventeenth century examples of Ottoman intellectuals and literati: the physician and anatomist Shams-ül-Din İtaki, the scholar and clerk Katip Çelebi, and the traveller Evliya Çelebi. All are famous figures. All took over also on European sources, languages and knowledge. In all cases the new knowledge affected perceptions of the world and man's position in it, whether medically or geographically. The dual facts that the knowledge presented was new and that it arrived from Christian Europe were publicly recognized. It seems, therefore, that it was not inconceivable to combine these two scientific traditions, namely the Ottoman and the European, or following George Saliba, realize that Europe and Islam were, at least in part, two components of one universal scientific culture.²⁷ In all three cases, the interest was in 'new' ideas and information rather than its European origin. And the outcome was still very much Ottoman thinking.

SHAMS-ÜL-DIN İTAKI

Shams-ül-din İtaki was born in the 1570s in Shirvan in eastern Anatolia or western Iran. He had to leave his hometown on the Ottoman-Safavid border after losing his family in the course of the wars between the two empires in the 1620s. He moved to Istanbul and introduced himself to court by dedicating his treatise *Tashrih-i abdan ve tarjuman-i kabala-yi falasufan* ("The Anatomy of the Body Parts and Expounding the Role of the Philosophers") to

26. Collins, *The Sociology of Philosophies*.

27. George Saliba, "Arabic Astronomy and Copernicus," *A History of Arabic Astronomy: Planetary Theories during the Golden Age of Islam* (New York: New York University Press, 1994), 291-307. Ben-Zaken, "The Heavens of the Sky and the Heavens of the Heart," 4-5.

Murad IV through Topal Recep Pa a who acted as vizier for a short while in 1632. This places the writing of the treatise around 1630. The vizier liked his work and bestowed upon him the prestigious position of Keeper of the Holy Mosque in Mecca. Further details of a biographical nature are not known.²⁸

Itaki's medical work continued well trodden paths in Muslim medicine, while making independent steps in several noticeable points. Itaki based himself in part on Ibn Sina's *Kanun*, and in part on the thirteenth-century author Ibn al-Nafis's summary and criticism of Ibn Sina in his *Sharh tashrih al-kanun* (Ibn al-Nafis, for example, corrected Galen and Ibn Sina in his theory of the pulmonary circulation of the blood, anticipating William Harvey).²⁹ Itaki structured his book using the traditional model of Muslim anatomical book. He started with exposition of Galenic humoralism in its Arab-Muslim adaptation and then described each organ. He separated the organs into two groups: simple organs (organs of the same structure, such as blood, bone and muscle) and complex ones (such as the system of respiration and digestive), following Ibn Sina's classification. On some points, however, Itaki gave different information or explanation than Ibn Sina's. This was the case, for example, in Itaki's discussion of the nerve system or the embryo.³⁰ Following his Arabic sources, Itaki usually used Arabic terms, but he added their Turkish equivalent, and in some rare cases mentions also the Persian terminology. In this regard Itaki's work was an important stage in the evolution of technical-medical terminology in the Ottoman-Turkish language.

Itaki's work introduced some new information on various body parts and a new understanding of the human body as a whole. This

28. Esin Kâhya, *Şemseddîn-I İtâkî'nin Resimli Anatomi Kitabı* (Ankara: Atatürk Kültür Merkezi Yayını, 1996), 1-2.

29. On Ibn al-Nafis see Max Meyerhof and J. Schacht, "Ibn al-Nafis," *EF*, 3:897-898.

30. Esin Kâhya, "One of the Samples of the Influences of Avicenna on the Ottoman Medicine, Shams al-Din Itaki," *Belleten*, 64:4 (2000): 63-68.

was done in the anatomical illustrations of his discussion of various body parts (*Tashrih-i al-ebdan* is the only illustrated monograph on anatomy written in the Ottoman Empire). As in previous works in the Muslim world, we find the human skeleton, muscles, veins and arteries, nerves, and the growth of the fetus, but Itaki went on to mingle two separate traditions in anatomical scholarship.

Itaki continued the anatomical set out in *Tashrih-i mansuri*, a fourteenth century anatomical work in Persian by Mansur b. Muhammad b. Ahmad b. Yusuf b. Ilyas dedicated to Timur's grandson. *Tashrih-i mansuri* is the first work known to include anatomical illustrations in the Muslim world. Itaki, like Ibn Ilyas, uses whole figures in order to portray various 'systems' (nerves, muscles, blood vessels, etc), depicting them in a distinctive squatting posture. Itaki also reproduces Ibn Ilyas's female figure to portray the growth of the fetus. This particular illustration is Ibn Ilyas's innovation, as the other illustrations were apparently inspired by earlier Latin medical diagrams, although how it is not known. These illustrations are highly schematic.

Itaki added considerably to Ibn Ilyas's *Tashrih-i mansuri* (25 pages were enlarged to 276) and more importantly, diverted from it. Itaki was influenced also by Andreas Vesalius (1514-1564) and his *De Humani Corporis Fabrica* ("The Structure of the Human Body") printed in Basel in 1543. Vesalius used the help of an artist, Jan van Kalker, to produce the wood-cut illustrations for his anatomical text and atlas (hence anatomical information was displayed by means of the classical statue-like figures, familiar to artists). Itaki used this model for his illustrations of eye muscles, brain, skull, bones of hands and feet, and the vertebral column. From Juan de Valverde, a Spanish anatomist, Itaki copied a female figure displaying her reproductive organs, which appeared in the 1556 *Historia de la Composicion del Cuerpo Humano* ("The Account of the Composition of the Human Body").³¹ However, Itaki included Valverde's sketch

31. Esin Kâhya, *Şemseddîn-I İtâkî'nin Resimli Anatomi Kitabı* (Ankara: Atatürk Kültür Merkezi Yayını, 1996), especially pp. 255-358 for reproduction of the

of a pregnant figure side by side with the 'traditional' Mansuri female figure, the European-like drawing assimilated into the Muslim schematic tradition.³²

Itaki thus blended two distinct artistic tastes and anatomical traditions. The Muslim illustrations are flat, two dimensional, schematic and impressionistic renderings of human beings. In many cases, like Itaki's, it is clear they were drawn by the author rather than using an accomplished artist. We may associate the evolution of Muslim anatomical illustration in this way the religious instruction which led to a cultural tendency of refraining from the figurative or realistic depiction of humans, lest it be interpreted as the creation of idols, as said in the Qur'an: "Set not up with God another god".³³ This rule was kept strictly in mosques which are adorned only with colors, and architectural, geometrical and epigraphic elements. There are no pictures of humans or animals. Outside mosques human figures were indeed portrayed, even as illustrations for religious texts, but in a decidedly non-realistic manner. In Europe, however, starting with Leonardo da Vinci (1452-1519) for artistic purposes and then Andreas Vesalius for medical-scientific purposes, 3-D images of human body parts and anatomical systems were produced, trying to imitate reality as much as possible. In addition to changes in aesthetic taste, these images present an important stage in the scientific revolution in Europe during the Renaissance and early modern period. Instead of reproducing anatomical conventions yet again, now Galenic tradition was confronted. In the Muslim Middle East, on the other hand, there was no wish for naturalism and

drawings from Itaki and Vesalius; Gül Russell, "The Owl and the Pussycat : The Process of Cultural Transmission in Anatomical Illustration," in Ekmeleddin Ihsanoğlu, ed. *Transfer of Modern Science and Technology to the Muslim World* (Istanbul: The Research Centre for Islamic History, Art and Culture, 1992), 191-195; Adıvar, *Osmanlı Türklerinde İlim*, 129-130; Kâhya and Erdemir, *Bilimin Işığında Osmanlıdan Cumhuriyete Tıp ve Sağlık Kurumları*, 177-179.

32. Russell, "The Owl and the Pussycat," 192-193.

33. sura 17/al-Isra, The Night Journey, 22; English translation from Arthur J. Arberry, *The Koran interpreted* (London, 1955).

indeed the result is not realistic or clinically accurate. Itaki's work, despite (or maybe because of?) its uniqueness, was accepted which explains why it was recopied several times: today seven manuscripts are in existence. His religious career also indicates that the knowledge of anatomy, and new anatomy at that, and a religious career were not mutually exclusive in Ottoman eyes.

EVLIYA ÇELEBI

Evliya Çelebi needs no introduction. Thanks to the life research of Robert Dankoff and others, Evliya has become one of the more famous figures of the Ottoman period. He was born on the Golden Horn and raised in the Sultan's palace. Istanbul was naturally the center of his world. Istanbul was also the touchstone and measure of everything he saw. He was the opposite of parochial, however. He loved to make comparisons, and he had many points of reference other than Istanbul. Evliya has the reputation of being a fantasist, an exaggerator, and a liar. He certainly writes in a hyperbolic style. However, his *Seyahatname* contains fictions as well as facts. Evliya Çelebi had two different motives, related to the traditional twin aims of *adeb*: to instruct as well as to entertain. He aimed both to inform and to entertain, and thus includes jokes, lies and tall tales alongside reliable and creditable information. His rhetoric comprised two registers: one of persuasion where he is rational and bases his information on cited sources, and one of diversion in which he arouses the wonder and delight of his patrons and audience.³⁴

Our concern with Evliya Çelebi here relates to his description of several exceptional head operations he claimed to have witnessed in European hospitals in Vienna and Monastir in the year 1665. The first event Evliya relates, and in a very elaborate manner, is also the most extraordinary: a sort of brain surgery. During the operation the surgeons removed part of the patient's skull at the cap to recover

34. Robert Dankoff, *An Ottoman Mentality: The World of Evliya Çelebi* (Leiden: Brill, 2004).

a rifle bullet that entered the patient's head.³⁵ There is no need to go into the debate whether this description is factual or not, as what interests us here is conceptions and attitudes prevailing in Ottoman society towards European medicine and surgical techniques.

Evliya was overwhelmed by the high level of medical capabilities that European physicians mastered. He was puzzled and maybe also shocked by the nature of some of the procedures he saw. By Evliya's time European medicine was starting its revolution and evolution. After Andreas Vesalius (1514-64) and his *De Humani Corporis Fabrica* (*The Structure of the Human Body*) printed in Basel in 1543, surgery and anatomy in Europe were steadily moving away from Galen, tenth century al-Zahrawi, and eleventh century Ibn Sina shaped Muslim Galenic Humoralism. It was the age of William Harvey (d. 1657) who showed the circulation of blood was continuous and unidirectional, and the discovery of the microscope and introducing it into medical science. Yet Evliya gives the impression that, on the whole, the scientific and clinical tradition he saw was quite familiar to him. Evliya regarded European anatomy as resembling the conventional wisdom in the Ottoman Empire known to him.

KATIP ÇELEBI

The third example of an Ottoman scholar incorporating European knowledge is Mustafa bin Abdallah (1609-57), a scholar and a scribe in the financial bureau of the Army, hence the two titles-cum-nicknames under which he became known: Katip Çelebi ('master clerk') and Hajji Khalifa ('a deputy to the head of the department within the bureaucracy who made a pilgrimage to Mecca').³⁶ He

35. Evliya Çelebi, *Seyahatname*, vol. 7 (Istanbul, 1928), 277-285. See also John Livingston, "Evliya Çelebi on Surgical Operation in Vienna," *Al-Abhath*, 1970, 23:223-45; Arslan Terzioğlu, "Evliya Çelebi's Beschreibung der Südosteuropäischen Hospitäler und Heilbäder des 17. Jahrhunderts und ihre Kulturgeschichtliche Bedeutung," *Revue des Études Sud-Est Européennes*, 1975, 13:429-42.

36. Orhan Şaik Gökyay, "Kâtib Çelebi," *EF*, 4:760-762; Eleazar Birnbaum, "The Questing Mind: Kâtib Çelebi, 1609-1657," *Corolla Torontonesis: Studies in Honour of Ronald Morton Smith* (Toronto, Ont.: TSAR, 1994), 133-158.

composed twenty-two treatises encompassing history, geography, a gigantic bibliographic encyclopedia in Arabic called *Kashf al-zunun 'an asami al-kutub wal-funun* ("Uncovering of Ideas: On the Titles and the Names of the Books and Sciences"), political tracts, and many others. A major portion of his output was on non-religious studies but he wrote on religion too, like his treatise on the application of astronomy in Muslim sciences or his collection of various questions in *fiqh* and *fatwa* answers. He also took a stand in the religious tensions of his days and voiced innovative ideas.³⁷ In his *Mizan al-hakk fi ikhtiyar al-ahakk* ("The Balance of Truth"), the treatise in Ottoman-Turkish he completed shortly before his death in 1657, he discussed various questions which at the time were causing violent controversy. The recurrent theme in this treatise is his rejection of what he saw as rigid and fanatic religious sanctimony. He claimed it was pointless to force people to forgo their customs. Even if they were not in line with the spirit of Islam, it was best to let people keep their traditions, as long as they are not in clear contradiction of religion. His experience was that most often, such an attempt was unsuccessful, anyway.

The education that produced this broad range of interests was based on traditional religious studies but not restricted to it. Katip Çelebi was a son of an Ottoman soldier who was born in Istanbul. He studied the Qur'an as a young child, followed by Arabic and calligraphy, preparing himself for a career within the bureaucracy. As a teenager he entered his father's regiment as a clerk and started his career in the Army Audit Office. Although a non-combatant he joined the army on several campaigns, as was the practice in his time. He participated in five campaigns during his ten years as a clerk, and during that period also performed the pilgrimage to the holy city of Mecca. Katip Çelebi said of himself that despite his frequent travels outside the capital, he nevertheless found the time to continue his studies in religious sciences, even though they

37. M. Tayyib Gökbilgin, "Kâtip Çelebi, Interprète et Rénovateur des Traditions Religieuses au XVII^e siècle," *Turcica*, 3 (1971), 71-79.

were patchy and frequently interrupted. He was proud of the many lectures he heard in various *medreses* in the capital on Qur'an commentaries, Arabic grammar, and Muslim theology and law. For our present purpose, it is worth noting that Katip Çelebi read European works in Latin on history and geography. He then transferred this knowledge to Arabic and Ottoman-Turkish so local readers could access new ideas.

When assessing Ottoman science as having westernization as its aim, Katip Çelebi is conceived as its beginning and fulfilment. This is the prevailing view of several Turkish scholars charged with western-oriented worldview who celebrated the 300th anniversary of his birth.³⁸ However, as Gottfried Hagen had conclusively shown, Katip Çelebi indeed took over European knowledge, for example in his *Jihannüma*, but his way of thinking remained thoroughly Ottoman.³⁹

LOOKING FOR NEW HORIZONS BUT STAYING ROOTED IN THE OTTOMAN WORLD

Eleazar Birnbaum introduces Katip Çelebi as someone whose “writings cover an astonishingly broad range of subjects, and show attitudes which were often quite unusual for his time and place.”⁴⁰ Evliya Çelebi too is anything but typical in many respects. He was a unique individual. Yet, juxtaposing them with Ibn Sallum and Itaki, the less colorful but of the same social circles and the product of the same cultural atmosphere, results in four cases which bring to light an intellectual phenomenon. There are too many such similar

38. *Kâtip Çelebi: Hayatı ve Eserleri Hakkında İncelemeler* (Ankara: Türk Tarih Kurumu Basımevi, 1957).

39. Gottfried Hagen, *Ein Osmanischer Geograph bei der Arbeit Entstehung und Gedankenwelt von Kâtib Çelebis Ğihännümā* (Berlin: Klaus Schwartz Verlag, 2003).

40. Eleazar Birnbaum, “The Questing Mind: K tib Chelebi, 1609-1657,” in Emmet Robins and Stella Sandahl, eds., *Corolla Torontonesis: Studies in Honour of Ronald Morton Smith* (Toronto, Ont.: TSAR, 1994), 134.

or parallel cases to discard them as individual eccentricities or unrelated evidence. Expanding Dankoff's view of Evliya Çelebi to the whole group, the four scholars may be taken as the representative Ottomans of a certain age and social status, and offer us a view of the Ottoman mind from the inside.

Seventeenth century Istanbul cultivated a cultural space whose inhabitants (Ottoman elite bureaucrats and literati) shared similar concepts of knowledge and its legitimate sources. They wrote within the same discourse for a common intellectual goal. They were bound together by shared concepts of knowledge, and of the rules for attaining and determining such knowledge. They wanted to continue the evolution of science in Ottoman society to include new bodies of knowledge (whether cartography, for example, in the case of Katip Çelebi, anatomy in the case of Itaki, or chemical medicine in the case of Ibn Sallum), and expand the sources of legitimate knowledge to encompass Europe as an authority.⁴¹ Ibn Sallum and his three contemporaries were part of a gradual trend of growing exposure to European knowledge. Ibn Sallum was able to be 'daring' (in *our* eyes) in introducing new knowledge precisely because it was conceivable for him to be so. His intellectual milieu shaped him in this way.

The exposure to European knowledge and its inclusion in their writing reveal reception and intention on the part of our Ottomans. The circulation of knowledge does not happen in chance, by itself, or enforced on the person(s) in question. Such an intellectual activity necessitates willingness to absorb, appreciation of the value of the knowledge on the part of the receiver, trusting its source.⁴²

41. I follow Paul L. Heck who discussed medieval Arabic philosophy of knowledge. See his *The Construction of Knowledge in Islamic Civilization* (Leiden: Brill, 2002); idem. "The Epistemological Problem of Writing in Islamic Civilization: al-Ḥaṭīb al-Baġdādī's (d.463/1071) Taqyīd al-'ilm," *Studia Islamica*, 94 (2002), 85-114; idem. "The Hierarchy of Knowledge in Islamic Civilization," *Arabica*, 49 (2002), 27-54.

42. I adopted this idea from Dr. Avner Ben-Zaken from his work on the practice of astronomy in late sixteenth-century Salonika as a case of bridging networks of

It is worthwhile remembering there was a long tradition with Muslim intellectual life of interest in pre-Muslim or non-Muslim histories, for example within the framework of 'universal history'. There was awareness of other civilizations, past and present with positive intellectual responses. We can go back to Abu al-Hasan Al-Mas'udi (d. 345/956) to see how this tradition in Muslim historiography, geography and history developed.⁴³

Ibn Sallum and his contemporaries lived in a world in which the Ottoman Empire no longer occupied the central position in the universe, geographically as well as historically. They were aware of this. They experienced profound and interrelated changes. Even if these changes did not always bring about a complete overhaul of old ways of thinking, they certainly added to the strain already present in the old models. Derin Terzioğlu pointed out that these transformations created uncertainty, and as a result early modern period people were a good deal more 'anxious' than their medieval counterparts.⁴⁴ This intellectual background is one possible motivation for Ottoman scholars to transmit through translation information from another one culture (here: European) and thus correct and expand Muslim-Ottoman knowledge in various scientific branches (geography, cartography, medicine, etc).⁴⁵

The new knowledge did not upset Ottoman scholars greatly. Maybe they did not fully grasp how dramatic the epistemological change that is about to occur. At any rate they were incorporating the new information into the body of Muslim-Ottoman knowledge. Europe replaced neither the traditional sources of knowledge

intellectuals. I thank Dr. Ben-Zaken for allowing me to read his work-in-progress on this project.

43. Ahmad M.H. Shboul, *Al-Mas'ūdī and His World* (London: Ithaca Press, 1979).

44. Derin Terzioğlu, "Man in the Image of God in the Image of the Times: Sufi Self-Narratives and the Diary of Niyāzī Miḥrī (1618-94)," *Studia Islamica*, 94 (2002): 164.

45. Gottfried Hagen, "Some Considerations on the Study of Ottoman Geographical Writing," *Archivum Ottomanicum*, 18 (2000): 233.

in Ottoman-Muslim society, nor its contents. Moreover, the extent which European scientific innovations were understood by these Ottomans was limited. Despite the increase in the use of western knowledge, the emphasis was still the traditional concept of Muslim learning based on known authorities and textual transmission of knowledge. Assimilation into the Ottoman context was a means to make sense out of new information and concepts, control or contain it by incorporating it into Ottoman existing knowledge and world views. But in turn, of course the new knowledge contributed to the rising tensions and worries as not everything could be neatly absorbed.

Ibn Sallum and his intellectual milieu neither claimed nor thought of themselves as a dramatic turning point. They reproduced common Ottoman thought that was shared by broad groups of the populace and not just esoteric knowledge comprehensible to only few scholars. These scholars enjoyed deriving new knowledge, practical and spiritual, and aimed at gaining 'truth' and understanding for themselves. At the same time they were not locked in an ivory-tower and worked with a wider audience. They enjoyed astonishing their readers or listeners.⁴⁶

Although Ibn Sallum's work on the new chemical medicine inspired further works on this subject and started a trend, it did not bring about a radical transformation of Ottoman medicine. Galenic medicine continued to be the standard to which Ottoman medical men adhered. Previous medical texts in Arabic and Turkish were by no means redundant. Even toward the end of the eighteenth century, when some Ottoman healers, especially in Istanbul, were familiar with the writings of Herman Boerhaave (died 1738), the Dutch humanist recently translated into Ottoman-Turkish under the instructions of Sultan Mustafa III (reigned 1757-1774), most physicians in the Ottoman provinces were still content with Ibn

46. Hagen, "Some Considerations on the Study of Ottoman Geographical Writing," 188-189.

Sina's eleventh-century *Kanun*.⁴⁷ Meanwhile in Europe the distance from Muslim-Galenic medicine became more and more apparent,⁴⁸ even though Humoralism continue to affect medical theory and practice well into the nineteenth century. Seventeenth century Ottoman writers did not feel they were making a break with their Arabic-Muslim medieval past. If there was a spirit of change at all, and at least in the case of Ibn Sallum it seems there was some – the title of his treatise attests to that – it was a more radical thing than its practice. Despite their originality they remained on the trodden paths of tradition, neither realized they may be starting a new tradition nor wanted to create new one.

During the eighteenth the trend even intensified and the interest in novelty and change infiltrated from theoretical intellectual activity into more aspects of Ottoman art and culture, like that of architecture. Eighteenth-century elite Ottomans were fascinated with novelty. One of the central motifs in this period was a celebration of originality. The climate of change included a wider receptiveness to foreign new ideas, both western (European) and eastern (Persian). Yet there was no break with the past and classical Ottoman stylistic traditions lingered while maturing.⁴⁹

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47. J. Worth Estes and Laverne Kuhnke, "French Observations of Disease and Drug use in Late Eighteenth-Century Cairo," *Journal of the History of Medicine and Allied Sciences*, 39 (1984), 129.

48. Andrew Wear, "English Medical Writers and Their Interests in Classical Arabic Medicine in the Seventeenth Century," in G.A. Russell, ed. *The 'Arabick' Interest of Natural Philosophers in Seventeenth-Century England* (Leiden: Brill, 1994), 266-277.

49. Shirine Hamadeh, "Ottoman Expressions of Early Modernity and the 'Inevitable' Question of Westernization," *Journal of the Society of Architectural Historians*, 63 (2004): 32-51.