

THE LEGAL STATUS OF SCIENCE IN THE MUSLIM WORLD  
IN THE EARLY MODERN PERIOD:  
AN INITIAL CONSIDERATION OF *FATWĀS* FROM  
THREE MAGHRIBĪ SOURCES

Justin Stearns

*Introduction*<sup>1</sup>

In 1993, the sociologist of science Toby Huff published *The Rise of Early Modern Science: Islam, China, and the West*, the second edition of which appeared in 2003.<sup>2</sup> The book's ambition—an investigation into why modern science emerged in Western Europe and not in China or the Muslim world—was reflected in the impressive amount of secondary literature that the author consulted. In brief, Huff concluded that both Islamdom and China had lacked the institutional structures developed in early modern Europe that would have facilitated the emergence of what he called “neutral zones” of scientific inquiry.<sup>3</sup> By

---

<sup>1</sup> A version of this paper was presented at the 2008 AAR conference in Chicago. I would like to thank the panel's commentator, Mohammad Fadel, for his insightful comments, and Toby Jones and Nathalie Peutz for their close and helpful readings of an early draft of this paper. I am also grateful to Kareem Khalifa, who was kind enough to talk through some of the theoretical issues raised by the relationship between law and science with me. Finally, I am deeply grateful to Asad Ahmed and Behnam Sadeghi for their careful readings of this paper, their numerous corrections and many helpful suggestions. They saved me from many embarrassing mistakes. All views expressed here are, of course, my own.

<sup>2</sup> All references here are to the second edition.

<sup>3</sup> What Huff meant precisely by “neutral zones” is unclear to this author. The closest he comes to defining them precisely is as follows (*Rise*, 219): “The problem was not internal and scientific, but sociological and cultural. It hinged on the problem of institution building. If in the long run scientific thought and intellectual creativity in general are to keep themselves alive and advance into new domains of conquest and creativity, multiple spheres of freedom—what we may call *neutral zones*—must exist within which large groups of people can pursue their genius free from the censure of political and religious authorities. In addition, certain metaphysical and philosophical assumptions must accompany this freedom. Insofar as science is concerned, individuals must be conceived to be endowed with reason, the world must be thought to be a rational and consistent whole, and various levels of universal representation, participation, and discourse must be available. It is precisely here that one finds that great weaknesses of Arabic-Islamic civilization as an incubator of modern science.”

focusing on the reception and debate of ideas within a larger public sphere, Huff emphasized social, cultural, and civilizational factors, instead of technological or narrowly scientific ones.<sup>4</sup> Reviews of the first edition, while mixed, were generally positive, and the publication of a second edition ten years after the first speaks to the book's having reached a substantial audience.<sup>5</sup> Perhaps of most interest to students of the Muslim world was an exchange between Huff and the historian of Islamic science George Saliba, that took place shortly before the appearance of the book's second edition.<sup>6</sup> Saliba took issue with Huff's definition of "neutral spaces," and argued forcefully that the rise of modern science in Modern Europe was best explained with reference to the economic boost that Europe received from its conquest of the New World, instead of being due to a decline in astronomical thought in the Muslim world.<sup>7</sup> Saliba's other criticisms generally coincide with those in some of the initial reviews of Huff's book: that asking the question of when modern science arose is tautological as it presupposes a simplistic conception of modern science being inherently Western;<sup>8</sup> that Huff lacked a sufficient command of the history of astronomy;<sup>9</sup> and that in his focus on cultural or civilizational factors which may have hindered or facilitated the production and spread of scientific knowledge, Huff had made statements that bordered on racist.<sup>10</sup> Despite the criticisms of Huff's work, I have found the way

---

<sup>4</sup> Huff, *Rise*, 219.

<sup>5</sup> A brief survey of major journals reveals quite disparate responses to the book. Crombie's review was entirely positive, and the reviews of Elman and Restivo largely so, while Lindberg was more critical, and Major and Henry discussed the book in solely negative terms.

<sup>6</sup> The exchange between Saliba and Huff appeared in three installments in the *Bulletin of the Royal Institute for Inter-Faith Studies*.

<sup>7</sup> Saliba, "Flying Goats and Other Obsessions." In his recent *Islamic Science and the Making of the European Renaissance*, 248–55, Saliba again stresses the importance of the European colonization of the New World for the rise of modern science in Europe.

<sup>8</sup> See the reviews by Lindberg and Major, and Saliba, "Seeking the Origins of Modern Science."

<sup>9</sup> In addition to the reviews cited in the previous note, see also Saliba, "Flying Goats."

<sup>10</sup> Henry, in his review of *Early Modern Science*, 102, writes: "Surely we are not meant to conclude that Western civilization is more rational [than Islam or China] because its constituent members are more rational than Arabs or Chinese?" Saliba, for his part, goes as far to say (in "Flying Goats"): "At this late date, is it still possible for a serious scholar to be so enthralled by Oriental racism that he is incapable of perceiving even the slightest difference between Muslim circles in the West (whatever that means) and the various conditions of Muslims in Brunei, Indonesia, India,

in which he framed his central question—what types of social and institutional factors facilitated the emergence of modern science?—a productive one for considering the interaction between science and jurisprudence (*fiqh*) in the Muslim world in the early modern period. Huff argues that the Scientific Revolution was not as much a series of empirical or technical achievements, as it was the spreading of a new *Weltanschauung* through institutions:

an institution in a strict sociological sense is not simply an organization but rather an institutional complex of *patterned behavior that is generalized throughout a society*. At an incipient stage of development a new set of values might be realized in only one organization, but if they do not transcend that organization to permeate the other institutions of society, such patterns of behavior are not expressions of the institutional foundations of the society. This is largely what happened in the civilizations of Islam and China.<sup>11</sup>

Unfortunately for Huff, his characterization of the major institution of the Islamic world that he considers—the *madrassa* and Islamic law in general—is deeply flawed. Saliba has already questioned the accuracy of Huff's observation that the natural sciences were not taught in *madrassas* is accurate.<sup>12</sup> Even more pertinent is the fact that Huff's portrayal of the nature of Islamic law and its practice in the post-formative period is dated, based as it is on the now-discredited notion that independent legal reasoning ceased in roughly the eleventh century.<sup>13</sup> Huff uses the notion that Islamic legal scholars ceased to question the authority of the past at that time to argue, both implicitly and explicitly, that medieval and early modern European scholars were

---

Nigeria, Tunisia, Morocco, or even Turkey? Neither then nor now? This is indeed regrettable.”

<sup>11</sup> Huff, *Rise*, 334.

<sup>12</sup> Saliba, “Flying Goats.”

<sup>13</sup> Huff, *Rise*, 91ff. None of Huff's critics has drawn attention to this lapse. Admittedly, recent scholarship, while agreeing that Muslim jurists continued to exert independent reasoning within the established law schools, differs on whether this reasoning took place under the rubric of *ijtihād* or *taqlīd*. Compare Jackson, *Islamic Law and the State*, 128, 152–62, with Hallaq, “*Iftā'* and *Ijtihād* in Sunni Legal Theory,” Wiederhold, “Legal Doctrines in Conflict” (especially the insightful comments at 259–68), and Fadel, “The Social Logic of *Taqlīd* and the *Mukhtasar*.” For an introduction (leaning towards the views of Hallaq, Wiederhold and Fadel), see Viktor, *Between God and the Sultan*, 151–61. For recent discussions of how Muslim scholars continued to make advances in philosophy and logic during the early modern period, see Wisnovsky, “The Nature and Scope of Arabic Philosophical Commentary,” and El-Rouayheb, “Sunni Muslim Scholars on the Status of Logic.”

distinguished from their Muslim counterparts by their ability and inclination to view reason and rational inquiry as both desirable and necessary.<sup>14</sup> In the following discussion, I argue that such a claim is misleading and ignores a nuanced acceptance of rational inquiry on the part of Muslim scholars in the early modern period.

I have already referred to the ambition of Huff's book, and it is understandable that any single scholar attempting to offer a synthesis of the literature on science in medieval and early modern Europe, China and Islamdom, may occasionally miss works of importance. However, the sea-change which has taken place during the last three decades of scholarship on Islamic law in the post-formative period (roughly the eleventh to eighteenth centuries) has been profound. If Huff had had the opportunity to familiarize himself with any of the work of Wael Hallaq, Bernard Weiss, Baber Johansen, Sherman Jackson, David Powers, Mohammad Fadel, or Haim Gerber, to name only a few prominent scholars in this field, he would have had to reconsider many of his basic preconceptions regarding Islamic law in the early modern period: that it was conservative and static while simultaneously ignoring legal precedent, that it opposed philosophy, and that its practitioners failed to inquire after higher principles with which they could theorize their study of law.<sup>15</sup> Yet, however misconceived Huff's understanding of Islamic law may be, his question of the nature of law's relationship to science in the Muslim world during the early modern period is important, and has attracted little attention to date.<sup>16</sup>

---

<sup>14</sup> Huff, *Rise*, 116.

<sup>15</sup> Huff, *Rise*, 91, 96, 169, 212, and *passim*. The prevalence of the now questionable characterization of Islam's "decline" in the early modern period can be seen in Saliba's attempt (in "Seeking the Origins of Modern Science?") to shift this label from science to law and theology: "This [the "golden age of astronomy" from the fourteenth to the sixteenth centuries] does not mean that there was no age of decline, but it can be documented that it primarily occurred in legal and religious thought, rather than astronomical thought, during the period in question, a result almost exactly opposite to what the Eurocentric model would predict."

<sup>16</sup> Here I am sympathetic to Lindberg's comment at the conclusion of his review of Huff's book: "Finally, it is important to make clear that my skepticism about Huff's success in reaching his stated goal—explaining why modern science was a European discovery—and about a number of his historical arguments does not discredit and should not be allowed to obscure his considerable achievements: the persuasive appeal to social and institutional factors to explain the differential fates of early science in Islam, China, and European Christendom." Let me be clear that I do not disagree with Saliba's argument for the importance of economic factors in the rise of modern science in Europe, but I feel that these represent only one of the aspects, albeit a very important one, relevant to this question.

In the following discussion, I will examine the place that natural science (chiefly astronomy and medicine) occupied in three of the most important collections of legal opinions (*fatwā*, pl. *fatāwā*) in the Muslim West during the late medieval and early modern periods: the collections of al-Burzulī (d. 841/1438), al-Wansharīsī (d. 914/1508), and al-Wazzānī (d. 1342/1923). Instead of representing editions of the author's own *fatāwā*, these collections contain selections from the legal decisions of hundreds of jurists over a substantial period of time. In this way, they offer valuable windows into the nature and variety of legal practice in the Muslim West in the post-formative and early modern periods.<sup>17</sup> The following discussion below should be seen as an initial attempt at answering the question of how the natural sciences were perceived in Islamic legal circles in the early modern period.

### *Defining "Science:" the Problem of the Sources*

While acknowledging that science is notoriously difficult to define, for the purpose of this paper I have chosen to frame scientific practices as those that, among other things, constituted an alternative form of authority to that professed by legal scholars. Science is considered here as a varied body of specialist knowledge, the nature of which is not primarily defined by the same interpretive practices that are the purview of jurists, which for its part draws on both scriptural sources—Qur'ān, *ḥadīth*, legal precedent—and legal theory (*uṣūl al-fiqh*). I recognize that this is a broad definition, but have chosen to cast as wide a net as possible, as I am primarily interested in how legal scholars evaluated, framed, and controlled an authority defined by criteria qualitatively different from their own—in this case specifically, the authority of scientists and scientific practices. Reflecting the questions posed to *muftīs* (those jurists who hand out *fatāwā*), the two main bodies of scientific knowledge considered in the collections of legal opinions examined here were astronomy/astrology and medicine. In the past decades, a substantial amount of scholarship has been published on the practice of astronomy and medicine in the Muslim world, as well as on the potential of writing social history through an investigation of legal

---

<sup>17</sup> The formative period of Sunni law is generally held to have ended with the formation of the principal schools of law by the fifth/eleventh century. See Melchert, *The Formation of the Sunni Schools of Law*.

opinions (*fatāwā*).<sup>18</sup> However, little to date has been written on science as an alternative discourse of authority within Islamic law, and in large part, this is understandable, for Muslim jurists comparatively seldom addressed the natural sciences.<sup>19</sup> The following discussion is no more than a first step in the investigation of the place of science in the Islamic Law in the early modern period, because of both its preliminary nature and the scope of the material it surveys.<sup>20</sup> It does not answer Huff's question regarding the social status of law in the Muslim world during this period, but it seeks to sketch an outline of how further research might do so.

A final issue should be briefly addressed before we turn to the legal decisions themselves. In the popular press as well as in academic surveys, the tension between science and religion has often been characterized as being either between reason and revelation, or else between empirical evidence and scriptural authority. Such characterizations are insufficient and misleading in the present context. Instead, we find that when Muslim legal scholars challenge scientific authority, they tend—with some notable exceptions—to take oppositional stands regarding the ways in which empirical evidence should be interpreted, and with which particular empirical evidence is relevant to the question at hand, but not with the value of empirical evidence itself. In doing so,

---

<sup>18</sup> Out of the many recent publications I have found the following especially useful: for astronomy, the work of D. King in general, and especially his *In Synchrony with the Heavens: Studies in Astronomical Timekeeping and Instrumentation*; and three articles by A.I. Sabra (“Situating Arabic Science: Locality versus Essence”; “Science and Philosophy in Medieval Islamic Theology: The Evidence of the Fourteenth Century; and “The Appropriation and Subsequence Naturalization of Greek Science in Medieval Islam.”) For medicine, I have been especially influenced by Perho's *The Prophet's Medicine*, and I have found Pormann and Savage-Smith's recent synthesis (*Medieval Islamic Medicine*) quite useful. For notable efforts to write social history through an examination of *fatāwā*, see Masud, Messick and Powers, *Islamic Legal Interpretation*, and Powers, *Law, Society, and Culture in the Maghrib*.

<sup>19</sup> The works of al-Burzulī, al-Wansharisī, and al-Wazzānī comprise altogether more than 8,000 printed pages. In a survey of the indices to these volumes, I found no more than a few dozen references to astronomy, alchemy, and medicine. For passing references in the writings of al-Qarāfi to the “rational sciences” remaining outside the purview of law properly understood, and “scientific observation” playing an important role in establishing proper *taqlīd*, see Jackson, *Islamic Law and the State*, 115, 128.

<sup>20</sup> This is especially true when we consider that not only are solely Mālikī *fatwā* collections remain to be published: see al-Hilah, “Classification of Andalusian and Maghribī Books of *Nawāzil*,” and al-Ḥarbī, *Namādhij min juhūd fuqahā' al-mālikiyya al-maghāriba fī tadwīn al-nawāzil al-fiqhiyya*. I am indebted to Jocelyn Hendrickson for both these references.

the legal scholars are motivated by what we may call an ethical concern for both the spiritual and the physical well-being of the Muslim community.

*Astrolabes and Revealed Law*

In general, while Muslim jurists in the early modern period disapproved of interaction with astrologers and soothsayers, they valued the technical abilities of astronomers, whose calculations facilitated both establishing prayer times and the beginning of the lunar months, especially Ramadan.<sup>21</sup> The work of David King in particular has shown how, with the creation of the office of timekeeper (*muwaqqit*) from—at the latest—the seventh/thirteenth century onwards, individual mosques in Egypt, al-Andalus and North Africa generally had religious officials who possessed sufficient astronomical knowledge to calculate the daily times of prayer, which varied according to time and place and could be notoriously difficult to establish for the noon and afternoon prayer, as well as on cloudy days.<sup>22</sup> Based on King's work, A.I. Sabra has suggested that the study of astronomy in general may have declined in the early modern period even as it was "naturalized" and its study became restricted to an "instrumentalist" view to aid with the correct establishment of ritual activities such as prayer and fasting.<sup>23</sup> I will return to some of the implications of Sabra's—admittedly tentative—suggestion later on, but the first case discussed here seems initially to bear out his argument. Neither King nor Sabra, however, offers an extended consideration of the legal status of scientific inquiry in early modern Islamic society.

---

<sup>21</sup> For an overview of astrology in premodern Islamdom, see Saliba, "Flying Goats." al-Wansharīsi includes an opinion of the respected Syrian scholar al-Nawawī (d. 676/1278) against visiting astrologers (*ityān al-munajjimin*, see *Mī'yār*, 12:366–67). See also Ibn Khaldūn's remarks on astrology, as discussed in King, "On the History of Astronomy in the Medieval Maghrib." I am grateful to Professor King for sending me a copy of this article, which will appear in a forthcoming *Variorum* volume.

<sup>22</sup> See most recently King, "On the Role of the Muezzin and Muwaqqit."

<sup>23</sup> Sabra, "The Appropriation and Subsequent Naturalization of Greek Science in Medieval Islam," 240. Huff cited this article of Sabra's in support of his own argument, and in his critique of Huff, Saliba argued that neither Sabra nor Huff had advanced enough evidence to prove that the "naturalization" of Greek science led to its decline. See Saliba, "Seeking the Origins of Modern Science?" and compare with his *Islamic Science and the Making of the European Renaissance*, 125ff.

Around the turn of the twentieth century, al-Wazzānī, the Moroccan author and compiler of the *fatwā* collection known as *al-Mi'yār al-jadīd*, was party to a serious disagreement regarding the role and authority of astronomical instruments in Islamic ritual.<sup>24</sup> His *fatwā* on this topic, taking up twenty-four pages and constituting the entire chapter on the call to prayer (*nawāzil al-adhān*), with its copious citations of Mālikī authorities, offers the reader a long and somewhat convoluted account of the difficulties of ascertaining the proper time for the call to prayer.<sup>25</sup> As such, it can be profitably read against Ebrahim Moosa's discussion and translation of the treatise by Aḥmad Muḥammad Shākir (1309–1377/1892–1958), written in 1939, on the permissibility of beginning the month on the basis of scientific calculation and not on an actual, visual sighting of the moon.<sup>26</sup> Both al-Wazzānī and Shākir conclude that astronomical calculations are necessary for the establishment of Islamic ritual and cite a long list of, respectively, Mālikī and Shāfi'ī authorities to substantiate their positions. Both authors also confront and refute contrary opinions in previous scholarship. Where they differ is that, while Shākir writes for a decidedly Salafī audience, al-Wazzānī, writing at the other end of the Arab world some decades before Shākir, situates himself within a purely Mālikī environment.<sup>27</sup> While Moosa argues that Shākir was, to some degree, trying to come to terms with the technological challenge of modernity, there is no explicit sign that al-Wazzānī was primarily reacting to anything more than a local disturbance in Morocco, for which he wished to find the appropriate legal response.<sup>28</sup>

<sup>24</sup> I have not been able to find any references to this episode in the historical sources for the period.

<sup>25</sup> al-Wazzānī, *al-Mi'yār al-jadīd*, 1:215–39.

<sup>26</sup> Moosa, “Shaykh Aḥmad Shākir and the Adoption of a Scientifically-based Lunar Calendar.” I am grateful to David Powers for this reference.

<sup>27</sup> While the term Salafī is quite complex in that it carries several distinct meanings, in this case it refers generally to those Muslims who in the nineteenth and early twentieth centuries believed that Islam needed to be reformed by rejecting the consensus of the four Sunnī law schools, and by engaging in a critical reexamination of Islam's scriptural sources. On the shifting relationship of the terms Wahhābī and Salafī, see Commins, *The Wahhabi Mission and Saudi Arabia*, 104–29.

<sup>28</sup> See Moosa, “Shaykh Aḥmad Shākir,” 62: “In this instance, the existing social context not only impinges on the self-understanding of Muslims, but also forces jurists to re-read the religious texts in order to derive new meanings that are in harmony with the new context. Surreptitiously, a new juridical logic evolves and transplants itself onto existing practice, without hardly any acknowledgment of the occurrence of such changes—in itself a phenomenon insufficiently documented in the history of

al-Wazzānī's *fatwā* is long and, as is common enough for the genre, interspersed with numerous quotations from the works of jurists of previous generations. I focus here on those sections with implications for the legal status of astronomy. It begins as follows:

There was a debate (*mudhākara*) among a group of legal scholars regarding the Friday Prayer. One of them said: It takes place very late in Fez; it is desirable for its prayer to be at the beginning of the time, even if only in one mosque, so that the preacher begin the sermon following the *adhān* of only one *mu'adhdhin* [presumably as opposed to waiting for all the calls to end]. He stated that this was the way it had been in the Prophet's time. The others in the group did not agree with him.<sup>29</sup>

After defending the custom of the people of Fez, and citing several authorities on the proper manner of sounding the call the prayer, al-Wazzānī relates that this argument became widespread among both scholars (*al-khāṣṣ*) and commoners (*al-'āmm*), and took on broader significance. He describes the party opposed to his own views as having no knowledge of the science of timekeeping (*'ilm al-tawqīt*), and says that the situation was only growing worse when an unnamed scholar rose up, seeking the approbation of the masses and supporting their stance:

He spoke to them with words from Khalīl's *Mukhtaṣar*, deluded into thinking that there was no knowledge, not even a little, that was greater than his own. He said to them: everyone ascertains the passing of dusk (*maghīb al-shafaq*), and only those who are stubborn and in denial could ignore its obvious nature. Time-keeping devices such as the astrolabe and others cannot be depended upon (*lā yu'awwal 'alayhā*), nor should one turn to them for knowledge of when the time [of prayer] begins.<sup>30</sup>

The *Mukhtaṣar* of the Egyptian Mālikī Khalīl b. Iṣḥāq al-Jundī (d. 749/1348 or 767/1365) was the standard legal reference work of the Mālikī

---

Islamic Law. Aḥmad Shākir, in the present instance, and other jurists who wrote on other issues, consciously or unconsciously interpolated Islamic law with the technology of modernity, creating thereby a desire for regularity and consistency in *fatāwā* or juridical responsa, a subject that needs to be addressed elsewhere." While I agree with Moosa's general observation on the challenge modernity has posed to Muslim scholars, I am wary of seeing every reinterpretation of Muslim law in the modern period as only or even primarily the result of their interaction with modernity. Doing so could easily obscure the fact that premodern Islamic jurisprudence contained numerous opinions that, while of use to Muslims today, are not the product of an engagement with developments in the twentieth century.

<sup>29</sup> al-Wazzānī, *al-Mi'yār al-jadīd*, 1:215.

<sup>30</sup> *Ibid.*, 1:217.

school after the eighth/fourteenth century, and while its importance is clearly reflected by the substantial commentaries devoted to it, it was primarily important due to its recording of the accepted consensus.<sup>31</sup> As such, it may well have been the first reference a Mālikī jurist would turn to, but for an experienced jurist faced with a thorny problem, it would rarely be the last. Although Khalīl fails to mention astrolabes or astronomy, in his chapter on prayer his description of how to ascertain the prayer times he refers only to a staff (*al-qāma*) and its shadow, while in his discussion of fasting, he warns against trusting astrologers (*al-munajjim*).<sup>32</sup> al-Wazzānī quickly notes that he tried to find this individual to set him straight, but being unable to locate him, he decided to express his thoughts in writing in the *fatwā* at hand.

Knowledge of the times of prayer, it is clear, is mandatory for all believers, but following the authority of al-Ḥaṭṭāb (d. 954/1547), the author of a commentary on Khalīl's *Mukhtaṣar*, al-Wazzānī makes it clear that, due to the difficulty of the matter, establishing these times is a collective and not an individual obligation.<sup>33</sup> Knowledge of how to calculate the time accurately, he argues, belongs to those who have a command of the astrolabe and who are familiar with the science of timekeeping.<sup>34</sup> al-Wazzānī backs this claim up, appropriately enough, by citing the empirical observations of a renowned *muwaqqit* of Fez, Imām al-Jādārī (d. 818/1415 or 839/1435).<sup>35</sup> Strikingly, al-Wazzānī does not simply rely upon the authority of specialists such as al-Jādārī, but enters himself into the discussion of specifics, explaining to his reader why the views of Abū 'Abdallāh b. al-Ḥabbāk (d. 867/1463) and Muḥammad b. Yūsuf al-Sanūsī (d. 895/1490) on the subject of the changing length of dusk are to be preferred to those of al-Burzulī.<sup>36</sup>

<sup>31</sup> On *mukhtaṣar Khalīl*, see Fadel, "The Social Logic of *Taqīd*," and idem, "Adjudication in the Mālikī Madhhab," 262–65. Lohlker (*Islamisches Völkerrecht*, 124) has recently argued that Khalīl's *Mukhtaṣar* didn't achieve its widely accepted status until the sixteenth century.

<sup>32</sup> See al-Azharī, *Jawāhir al-iklīl 'alā mukhtaṣar al-imām Khalīl*, 1:32 (prayer), 145 (fasting). Since, as King has shown, the institution of *muwaqqit* was widespread in Mamlūk Egypt, it is curious that Khalīl did not, at least in passing, refer to a more exact form of timekeeping.

<sup>33</sup> al-Wazzānī, *al-Mi'yār al-jadīd*, 1:219.

<sup>34</sup> *Ibid.*, 1:221.

<sup>35</sup> Compare Kaḥḥāla, *Mu'jam al-mu'allifin*, 2:106, with 2:113–14. Al-Wazzānī also cites a treatise on the astrolabe by a certain Abū Faḍl Dāniyāl al-Shāfi'i, whom I have not been able to identify.

<sup>36</sup> For Ibn al-Ḥabbāk, see Kaḥḥāla, *Mu'jam*, 3:114. The reference here is to his poem on the use of the astrolabe, *Bughyat al-ṭullāb fī 'ilm al-aṣṭūrlāb*, on which al-Sanūsī wrote the commentary to which al-Wazzānī refers.

al-Wazzānī's sources reflect the complexity of the relationship between law, science, and theology (*kalām*) in the early modern Muslim world. al-Sanūsī's summation of Ash'ārī theology, *al-Muqaddimāt*, was widely read in the Maghrib until the modern period, yet he also wrote on the legitimacy not only of the astrolabe, but also of medicine. Although al-Sanūsī adamantly denied the existence of secondary causality in his theological writings—while affirming God's habit (*'āda*) of acting in a regular fashion—in his writings on medicine and astronomy, he supported the legitimacy and authority of non-religious sciences.<sup>37</sup> The compatibility of these various scientific pursuits, or perhaps more accurately the ability of early modern Muslim scholars to engage simultaneously in multiple intellectual discourses, should be emphasized, for it is precisely their incompatibility that scholars such as Huff have previously implied.<sup>38</sup>

al-Wazzānī interrupts his list of quoted authorities to note that one of his opponents wrote to a scholar living in Rabat, Aḥmad b. 'Abdallāh al-Ghurfi, distorting the issue (*lam yufsiḥ 'an sharḥ ḥaqīqatihā wa-kunhihā bal awḥama fī su'ālihi*) in order to receive an answer that would condemn the use of the astrolabe.<sup>39</sup> al-Wazzānī wrote to this scholar and clarified the nature of the argument to him, after which he received an answer which contained the following passage:

From the time that these instruments, the sine quadrant, the astrolabe and others, appeared in Islam and among its people, they were investigated, and it was found that the one knowledgeable in them, when proficient in their use (*idhā utqīnat fī naḥsihā*) benefited from the certainty [they brought]. It is necessary for someone who has no knowledge of them to follow someone who does have such knowledge (*taqlīd al-'ārif bihā*). One should act according to what he says, though it is necessary for him to exercise some caution when the sky and the horizon are cloudy. In this fashion is the action of the people of both east and west, as al-Ḥaṭṭāb has related from al-Qarāfi (d. 684 /1285) and others. No one

<sup>37</sup> On al-Sanūsī, see Stearns, "Infectious Ideas," 141–49. Historians have struggled with evaluating the influence that the general Ash'ārī denial of secondary causation may have had on evaluations of empirical evidence. For an example, see Stearns, "Infectious Ideas," *passim*.

<sup>38</sup> See Huff, *Rise*, 69–72, but also the cogent question of A. I. Sabra ("Situating Arabic Science, 664): "But there is no end to the questions that have yet to be answered.... And—the question of special importance for the historian of science—what was the effect of the *kalām* point of view on the dissemination and development of scientific disciplines such as cosmology and astronomy, about which the *mutakallimūn* had a lot to say as an integral part of their own worldview?"

<sup>39</sup> I have not been able to identify this scholar.

condemns reliance on instruments, save the ignoramus (*al-jāhil*) whose word has no weight (*lā 'ibra bi-qawlihi*).<sup>40</sup>

al-Wazzānī notes that this is similar to what the Imām Sīdī al-Tāwudī b. Sūda (d. 1208/1793) had said on the use of the astrolabe having a basis in the revealed law, and in the next few pages he presents an array of authorities who similarly support the use of the astrolabe.<sup>41</sup> It is clear, then, that there is no scholar of note of the Mālikī or any other school, who does not support the use of astronomy and the astrolabe for the purpose of bringing certainty to ritual practice.<sup>42</sup>

Before finishing with his opponents, al-Wazzānī has one final objection to deal with: the blanket assertion that the use of the astrolabe has no basis in law, and that it is suspect due to its association with philosophy. To deal conclusively with this accusation, he turns to the work of the prominent Moroccan scholar al-Ḥasan al-Yūsī (d. 1102/1691), from whose *al-Qānūn* he quotes at length:<sup>43</sup>

The answer to this is that there are philosophical sciences that are practiced in Islam, and it is correct that they be counted among the religious sciences due to the Law's benefit from them (*li-l-intifā' bihi fī-l-sharī'a*). The Shaykh Sīdī al-Ḥasan al-Yūsī, may God have mercy on him, has mentioned in his book *al-Qānūn* the science of timekeeping (*'ilm al-tawqīt*) as one of the Islamic sciences. Concerning it he said: It is one of the sciences of the ancients (*min 'ulūm al-awā'il*) such as the science of logic and the like. As for its being an Islamic science (*fī ma'nā kawnihā islāmiyyatan*): it is practiced in the Islamic community, which benefits from it in its religious practice (*fī dīn al-islām*), either directly or in a mediated fashion. It is also legally valid (*shar'iyya*), and what is established (*al-mashhūr*) is to grant the title of legal validity to a matter in both its essence and associated subjects.

<sup>40</sup> al-Wazzānī, *al-Mi'yār al-jadīd*, 1:223.

<sup>41</sup> A scholar of Fez, Ibn Sūda wrote a marginal commentary on al-Zurqānī's (d. 1122/1710) commentary on Khalīl's *Mukhtaṣar*. See Kaḥḥāla, *Mu'jam*, 3:363. The authorities cited by al-Wazzānī, besides those already mentioned, include 'Izz al-Dīn b. 'Abd al-Salām (d. 660/1262), al-Ghazzālī (d. 505/1111) and al-Māzarī (d. 536/1141). The *fatwā* later cites the support of the following scholars: Ibn 'Arafa (d. 803/1401), Muḥammad al-Raṣṣā' (d. 886/1481), and al-Maqqarī (d. 1041/1631). All of these except Ibn 'Abd al-Salām and al-Ghazzālī were of the Mālikī *madhhab*.

<sup>42</sup> While I do not doubt that the majority of Mālikī authorities shared al-Wazzānī's view, he may well have omitted inconvenient exceptions. By contrast, Moosa ("Shaykh Aḥmad Shākir," 62, 76) notes that while the famed Shāfi'ī scholar Taqī al-Dīn al-Subkī (d. 756/1355) accepted the use of calculations, the possibly even more famous Ibn Ḥajar al-Asqalānī (d. 852/1448) and Ibn Taymiyya (d. 728/1328) rejected them.

<sup>43</sup> I have not been able to locate all of the passages quoted here, but see al-Yūsī, *al-Qānūn fī aḥkām al-'ilm*, 274.

He says in another place...I count those [sciences] as belonging to Islam whose benefit has spread and the utility of which has grown great: along with the aforementioned [sciences] such as logic and accounting, [I count] and what is needed of astronomy (*'ilm al-hay'a*) and geometry...

The speech of this shaykh, may God be content with him, has indicated that what benefits Islam is not lessened by having a source other than Islam (*lā yaqdaḥ fīhi kaww aṣl waḍi'hi bi-ghayr al-islām*). It has been said: the inventor of the astrolabe was the prophet of God, our Lord Idrīs, may the prayer and peace [of God] be upon him and our Prophet. So let him who has no knowledge of this take care not to place his tongue in a place where it should not be, as we have related regarding one of the ignorant deniers, that he said concerning the rejection (*tanfīr*) of these time-keeping instruments as being of the science of the Christians, may God destroy them, and that mechanical clocks (*al-majānāt*) and their like are similar. None of this is to be trusted. Such a one as he is ignorant of the fact that reliance upon something is [to be evaluated] according to its benefit, not according to its location or its creator.<sup>44</sup>

al-Wazzānī's final paragraph shows that he is well aware that, by adopting technology in late nineteenth and early twentieth-century Morocco, one opens oneself to the accusation of mimicking the colonialist Europeans.<sup>45</sup> Nonetheless, he clearly rejects such a shallow, not to mention ironic, accusation, and in the last pages of his *fatwā* he emphasizes that for testimony concerning the correct prayer time to be accepted, the observer must be experienced.<sup>46</sup>

### *The Limits of Beneficiary Science*

In the *Mi'yār* of al-Wansharīsī, we find a *fatwā* of the renowned scholar Qāḍī 'Iyāḍ (d. 544/1149) that can productively be read against

<sup>44</sup> Wazzānī, *al-Mi'yār al-jadīd*, 1:227–28. It is striking that after marshalling the above arguments, al-Wazzānī still finds it necessary to posit a Muslim origin for the astrolabe. For a comprehensive discussion of other origins ascribed for the astrolabe in medieval Islamic sources, see King, "The Origin of the Astrolabe," esp. 45 (on the popular attribution of the invention of the astrolabe to Idrīs/Enoch). Finally, for a discussion of the term *al-majāna*, see García Gómez, *Foco de antigua luz sobre la Alhambra*, 82–85. I am grateful to Mercè Comes and David King for this reference.

<sup>45</sup> An interesting parallel to al-Wazzānī's dilemma can be found in the treatise on the plague by the Algerian Ḥamdān b. 'Uthmān Khoja (d. ca. 1258/1842), *Ithāf al-munṣifin wa-l-udabā' fī al-ihtirāz 'an al-wabā'*, arguing for the necessity of the quarantine, despite its alleged European provenance. See Stearns, "Infectious Ideas," 232–33.

<sup>46</sup> al-Wazzānī, *al-Mi'yār al-jadīd*, 1:231–32.

that of al-Wazzānī. It differs from the discussion of astronomy that we have just mentioned, in that instead of addressing a situation in which science is used directly in the service of Islamic Law, it instead examines a case where the authority of astronomers problematizes ritual practice.

In Khalīl's *Mukhtaṣar*, compiled some two centuries after Qāḍī 'Iyād's death, the author described the necessity of praying during an eclipse, a practice that had a firm basis in the Mālīkī school as well as in Prophetic tradition.<sup>47</sup> With this subject in mind, 'Iyād's questioner expressed a certain amount of anxiety regarding the claims made by astronomers that they could foretell both eclipses and their length:

He [Qāḍī 'Iyād] was asked about the eclipses of the sun, regarding the fact that the Prophet, may God bless him and grant him peace, had ordered at their occurrence prayer, invocations, the freeing of slaves, giving of alms, fear, and supplication. He [had] said: "[Pray] until what is in you [of fear] is removed (*ḥattā yukshaf mā bikum*)". There is no doubt that what he ordered is the truth, and that it [the eclipse] is one of the signs of God. This is what the people of the Sunna follow. Yet we see astronomers (*ahl al-ḥisāb wa-l-nujūm*) stating that they perceive the eclipse before it occurs, saying: "It occurs by itself, at such and such a time." It is well known that this is knowledge acquired through calculation, and that it happens due to an association (*iqtirān*), which they claim is between the stars in their respective spheres (*fī aflākihā ba'duhā bi-ba'd*). How can this be reconciled for the astronomers with the ordained fear and supplication [at the time of the eclipse], with its being an affliction that has descended upon people, and with their being ordered to engage in supplication until they are free of reprehensible types of things? There is no fright in them at such a time, no fear, for they say: We know when it will occur. Is there a way to reconcile the two matters? If we declared their statement void in its entirety, something would remain in the soul due to their accuracy (*iṣābatihim*)... and if what they say is not declared entirely false, and we support them in this matter being reachable through calculation, then where is our fear for our safety? Where is the fear that was ordered for us?... Indeed, what is sought after from this is how can we pray for the occurrence of the end of the eclipse (*fī injilā' al-kashf*), with their telling us the time when it will occur and when it will end, and with them possibly being correct

<sup>47</sup> al-Azharī, *Jawāhir al-iklīl*, 104–5. There are numerous traditions in Bukhārī and Muslim which link eclipses to visions of the Day of Judgment, while denying that they are related to the death of individuals.

in this. How can this be reconciled? Clarify for us what knowledge you have regarding this, may you be rewarded, God willing.<sup>48</sup>

The query puts 'Iyāḍ in a difficult position, for not only does there seem to be tension between the Prophetic tradition and the astronomers, with the former arguing that eclipses evoke fear, and the latter claiming to be able to predict their occurrence, but there is also the potential that the astronomers' claims could adversely affect the piety of the Muslim community.<sup>49</sup> At the beginning of his response, 'Iyāḍ seems to dispute the validity of astronomical predictions of eclipses in an absolute fashion, denying that the astronomers' proofs can reflect what God alone knows (*'ilm al-ghayb*). Yet this is a discursive move, one that functions to set his questioner at ease regarding the authority of astronomers: it is at best conditional, and not absolute.<sup>50</sup> 'Iyāḍ then goes on to admit cautiously that astronomers can rely upon the habitual experience of a competent observer (*'āda jarrahahā mutamakkin*) in their observations, even though their proofs do constrict the common good of the Muslim community (*al-maṣāliḥ*). In this context, the latter presumably refers to the effects of prayer and the act of relying upon God. While 'Iyāḍ notes that leading scholars generally dispute the knowledge of astronomers regarding eclipses, he also cites the exception of the prominent jurist Abū al-Walīd Ibn Rushd (d. 520/1126), whose *al-Bayān wa-l-taḥṣīl* was possibly the single most comprehensive reformulation of Mālikī *fiqh* in the post-formative period of Islamic jurisprudence.<sup>51</sup> Ibn Rushd had no objection to the views of the astronomers, argues 'Iyāḍ, because he saw no contradiction between them and the Prophetic tradition. After all, notes 'Iyāḍ, we certainly don't believe that the appointed prayers cause the eclipse to end, even though though the goal of the prayer is to put an end to the eclipse. No, the true benefit of the prayer is the acknowledgment of

<sup>48</sup> al-Wansharīsī, *Mi'yār*, 11:259.

<sup>49</sup> It is worth noting that this case is distinctly different from the eighth/fourteenth-century instance when Ibn al-Khaṭīb (d. 776/1374) famously challenged the validity of any Prophetic tradition that would place the Muslim community in peril. See Stearns, "Contagion in Theology and Law," *passim*.

<sup>50</sup> The parallels with the case of contagion are again striking, for while few if any Muslim jurists admitted the existence of contagion, many affirmed the transmission of disease. See Stearns, "Infectious Ideas," Chapter 5, and Conrad, "A Ninth-Century Muslim Scholar's Discussion of Contagion."

<sup>51</sup> On the status of *al-Bayān wa-l-taḥṣīl*, see Fernández Félix, *Cuestiones legales del Islam temprano*.

the eclipse as one of the signs of God, the intensity of fear felt during the prayer, and the recognition of God's omnipotence.<sup>52</sup> In the end, 'Iyād finds a balance between assuring his questioner that astronomical knowledge doesn't threaten religious practice, and acknowledging the ability of astronomers to accurately perceive God's habit, the existence of such a habit being a central concept in Ash'ārī theology. To be sure, the *fatwā* is not a ringing endorsement of the need for scientific research; yet, strikingly considering the way in which the question was framed, it does support the compatibility of religious law and astronomical knowledge.

*Law and Medicine: of Alchemists, Lepers and Tobacco*

The practice of medicine appears in the *fatwā* collections in a decidedly different fashion from astronomy, relating in part to a concern for the legitimacy of doctors as qualified witnesses. Not only is the authority of medical knowledge addressed, but also the question of whether the pursuit of medicine affects the status of the practitioner as a witness, i.e., does an interest in a specific art in and of itself constitute a moral flaw which invalidates anything the practitioner might say? It should be emphasized here that jurists saw themselves as the guardians of Muslim society, and that they were well aware of the activities of charlatans, astrologers, and tricksters, who would falsely present themselves to society as legitimate authorities.<sup>53</sup> Still, we should not imagine jurists as invariant killjoys, for while being wary of the practice of magic, on occasion they tolerated illusionists as well as the writing of amulets.<sup>54</sup> As the boundaries between astrology and astronomy, between magic and medicine, were not always clear, jurists had to be

---

<sup>52</sup> al-Wansharīsī, *Mi'yār*, 11:260–61. Included in this fear is the awareness that the eclipse may be a sign of the end of time. In structuring his argument, 'Iyād cites both Abū Bakr ibn al-'Arabī (d. 543/1148) and Abū al-Qāsim al-Muhallab (d. 436/1044); see 'Iyād, *Tartīb al-madārik*, 2:751–52).

<sup>53</sup> See Saliba, "The Role of the Astrologer in Medieval Islamic Society," and Porrmann, "The Physician and the Other: Images of the Charlatan in Medieval Islam."

<sup>54</sup> See al-Burzulī *Fatāwā*, 1:380–82, for an example of juridical tolerance of entertainment: in this case, a group of players would pretend to cut off an actor's head, and then make the head speak to them.

careful not only to protect believers' health and wealth, but also to shield them from all forms of polytheism.<sup>55</sup>

In this context, the character of the practitioner and the way in which he uses his knowledge were understood to be as important as the status of the art itself. In al-Wansharīsī's chapter on giving testimony (*al-shahādāt*) the following question addressed to Qāḍī 'Iyāḍ, illustrates this:

He ['Iyāḍ] was asked about the practice of alchemy (*ṣinā'at al-kīmyā*), whether it is permitted (*hal hiya min bāb al-jā'iz aw min bāb al-mustahīl*), and whether or not the one practicing it (*tālibuhā*) was to be forbidden [from doing so], and whether or not its practice invalidated (*yaqdaḥu*) the testimony of its practitioner.<sup>56</sup>

'Iyāḍ immediately affirms that alchemy is indeed a legitimate science, dealing with the making of glass and the analysis of pearls. His authorities here are unnamed doctors, and he notes that he has dealt with this subject at greater length in a separate work.<sup>57</sup> Turning to what he perceives to be the root of the question, 'Iyāḍ denies that alchemy can be linked in its essence to the practice of forging money. Such examples of fraud do not invalidate the efforts of expert practitioners of the science, who in general test the abilities of possible charlatans or hucksters in their profession. al-Wansharīsī, the editor, juxtaposes this clear endorsement of alchemy's legitimacy with the opinions of two prominent scholars, Ibn 'Arafa (d. 803/1401) and Abū al-Ḥasan 'Alī b. al-Muntaṣir (d. 742/1341), the first of whom had stated that the testimony of practitioners of alchemy was similar to that of those who sell sets of backgammon, drums, and pipes, and that it was therefore not valid; al-Muntaṣir, for his part, had stated that such a person wasn't permitted to lead the prayer.<sup>58</sup> The reader is left in the not unusual position of having to choose between conflicting opinions of

---

<sup>55</sup> The central issue here is causality, and the importance of not believing that anything other than God could cause anything to occur. How difficult this could be is seen in the example of prayers or spells: if these were written in Arabic they were considered safe, and al-Burzulī mentions (*Fatāwā*, 1:380–82) that his own teacher (possibly Ibn 'Arafa) would write certain names on paper, mix the paper with chicken eggs, cook the mixture and eat it. If, however, the words were written in a foreign language, then the object of invocation was unclear, and the act was disapproved, if not forbidden.

<sup>56</sup> al-Wansharīsī, *al-Mi'yār al-jadīd*, 10:155.

<sup>57</sup> I have not been able to identify this source.

<sup>58</sup> al-Wansharīsī, *al-Mi'yār al-jadīd*, 10:155.

prominent jurists, two of whom had cast doubt on the character of the practitioner of alchemy, and thus implicitly on the art itself.

In the case of medicine, the situation was clearer. In general, jurists acknowledged, though often only in passing, the expert testimony of a doctor regarding the nature of a disease or the state of a person's health. I have shown elsewhere how jurists generally acknowledged the transmission of disease in the case of leprosy, while often denying it in the case of the plague.<sup>59</sup> In the latter case, instead of rejecting the value of empirical evidence or the authority of doctors, jurists argued for alternative explanations of empirical observations that reflected the complexity of contemporary medical plague etiologies.<sup>60</sup> This was the case with the two *fatwās*, also collected by al-Wansharīsī, of the eighth/fourteenth-century Granadan jurist Ibn Lubb (d. 782/1381) who argued that Muslims should not abandon the sick in times of plague, as there was no conclusive evidence that it was transmitted by contact.<sup>61</sup> To be sure, there were jurists such as Tāj al-Dīn al-Subkī (d. 771/1369), who argued that if two doctors testified that a specific plague victim was a potential cause of harm to others, he should be avoided. In giving doctors such authority in the case of plague, al-Subkī was, however, in the minority.<sup>62</sup> With leprosy, on the other hand, a disease that was widely held to be a legitimate cause for divorce, the opinion of doctors was seldom disputed.

A particularly striking example of the acknowledgement of medical authority is found in al-Burzulī's collection of legal opinions, where he includes a *fatwā* from Ibn al-Ḥājj (d. 737/1336) on the value of a doctor's opinion on the presence or absence of leprosy:

Of the questions [treated by] Ibn al-Ḥājj is also the following case: Doctors testify regarding leprosy that is present before the date of the marriage contract, as [other witnesses] testify concerning a sale. There is no

---

<sup>59</sup> See Stearns, "Infectious Ideas," Chapters 1 and 3, *passim*. As always, there were notable exceptions, such as Ibn Rushd (d. 520/1126) denying the contagious nature of leprosy: see "Infectious Ideas," 114–16.

<sup>60</sup> There were notable exceptions, including the renowned and influential Egyptian jurist Ibn Ḥajar al-ʿAsqalānī, who wrote a long treatise on the virtues of the plague—death from which could lead to martyrdom—and how it was caused by *jinn*. See Stearns, "Infectious Ideas," Chapter 5.

<sup>61</sup> I have discussed these *fatwās* at length in "Contagion," *passim*.

<sup>62</sup> See Stearns, "Infectious Ideas," 215ff. al-Subkī was also decisively refuted by Ibn Ḥajar in the latter's treatise less than a century later. This refutation may—I speculate—have resulted in al-Subkī's treatise on the plague remaining extant only in citations in other works.

oath needed from the spouse to confirm this, nor is the matter open to dispute, as [is the case] when dispute occurs with his oath at the giving of testimony. (This is) because the judgment provided by the testifying of doctors has long been a definitive judgment (*ḥukm bi-l-qaṭ' bihi 'alā-l-qidam*).<sup>63</sup>

Yet, even while acknowledging the legal authority and value of medical testimony, jurists were concerned with controlling this testimony, either by investigating the qualifications of individual practitioners, or by presenting themselves as medical authorities in their own right. To be sure, many jurists had also studied medicine—though few of them may have had any actual clinical experience—but here I am interested in the ability of jurists to present medical knowledge as transmissible within legal circles without the presence of an actual doctor.

In al-Burzulī's *Fatāwā* we find an interesting example of how, while acknowledging the authority of medicine, a jurist could challenge that of the doctor. The scholar involved was al-Māzarī (d. 536/1141), a respected Mālikī.<sup>64</sup> The query reads as follows:

al-Māzarī was asked about someone who had married his virgin daughter [to a man]. The husband asked if he could have intercourse with her (*al-dukhūl bihā*) and the father claimed that on his [the husband's] body there was leprosy (*baraṣ*). They took the case to a judge, and he sent two doctors, one of them a *dhimmī* [a Christian or a Jew living under Muslim rule] who testified that there was on his body leprosy regarding which there could be no doubt (*lā yashukkūna fihi*). Does the wife have a choice [of sleeping with her husband] or not? And is the word of a non-Muslim to be accepted?<sup>65</sup>

In his answer, al-Māzarī stresses the necessity of the examining doctor being competent, and carrying out his investigation of the alleged leper's body in a thorough fashion. If he is incompetent (*qaṣīr al-bā'*),

<sup>63</sup> See al-Burzulī, *Fatāwā*, 2: 287. Compare with the view of Ibn Rushd: "The word of the doctor is valid in what is asked of him by the judge, concerning what is specific to the knowledge of the doctors even if he is not of moral probity (*ghayr 'adl*), or is Christian, if there is no one else to be found. The preference is for two persons of moral probity" (al-Wansharīsī, *Mi'yār*, 10:17). A similar (anonymous) opinion acknowledging the authority of doctors to ascertain leprosy can be found at *Mi'yār*, 7:341–42. Wansharīsī also records the opinion of Ibn Lubāba (d. 330/942), who cites the ability of doctors to ascertain whether a sickness is life-threatening or not (*Mi'yār*, 10:294). On the position of lepers in Medieval Islamic society in general, see Dols, "The Leper in Medieval Islamic Society."

<sup>64</sup> al-Māzarī also wrote an influential work on prayer, in which he had defended the use of the astrolabe. See his *Sharḥ al-talqīn*, 1:386–88.

<sup>65</sup> al-Burzulī, *Fatāwā*, 2:338.

then this will obviously not do. al-Māzarī is clear about how one can diagnose leprosy:

Is this or is this not a case in which there is a smell, which in connection with sitting or lying together has a clearly harmful effect? If they say: there is no smell, then test his place (of affliction) with the head of a needle. If it changes and its color becomes red, blood appearing in the area, then it is not leprosy, and the woman has no say in it. This is the word of the authorities among the doctors (*qudamā' al-aṭibbā'*), and I don't know of a stronger (*awthaq*) position than this.<sup>66</sup>

Immediately after affirming the authority of doctors of previous generations, al-Māzarī attacks the practitioners of his own day, claiming that there are no longer any doctors of any note. In part, this is certainly representative of a broader anxiety regarding the possibility of charlatans exploiting believers by posing as doctors. Yet, al-Māzarī's concerns are more specific. For him, it is not so much a question of charlatans, or a doctor's religion, as whether a given doctor acknowledges the medical position presented by al-Māzarī.<sup>67</sup> If a doctor follows the criteria laid out by al-Māzarī, then it is simply a matter of sensory perception and deduction (*amr ḥissī ḍarūri*). If a doctor gives different criteria, backing it up with citations, then he is permitted to do so, but his trustworthiness must be investigated by a judge. al-Māzarī then proceeds to deny the phenomenon of contagion, while affirming that proximity to lepers is harmful, a differentiation made at least as early as Ibn Qutayba (d. 276/889).<sup>68</sup> While affirming the veracity and authority of medical opinion, al-Māzarī has managed to appropriate medicine's authority as a discipline to an extent not seen in al-Wazzānī's discussion of astronomy above.<sup>69</sup>

<sup>66</sup> Ibid.

<sup>67</sup> Not all jurists were as generous with regard to religious identity. Ibn al-Ḥājj, whose support of the authority of doctors was cited above, was particularly vicious on the subject of Jewish doctors (Ibn al-Ḥājj, *Madkhal*, 4:107–15, 140–50).

<sup>68</sup> Ibid. On Ibn Qutayba, see Conrad, "A Ninth-Century Muslim Scholar's Discussion of Contagion." For a discussion of why the concept of contagion (as opposed to disease transmission) was rejected by many jurists, see Stearns, "Infectious Ideas," Chapter 1.

<sup>69</sup> Another example of a legal scholar appropriating the authority of medical knowledge can be found in al-Wansharīsī's denial of the permissibility of abortion (*isqāṭ al-janīn*), in which, while giving a detailed discussion of the process of gestation, he cites only legal authorities (*Mi'yār*, 3:370). This example should be compared with the opinion of al-Mawwāq (d. 897/1492) on both *coitus interruptus* and abortion (*Mi'yār*, 4:235–36). In both cases, Wansharīsī appends the views of Ibn al-'Arabī (d. 543/1148) to the initial opinion, and refrains from citing the views of doctors. On abortion in

A final intriguing example of the invocation of the authority of medical science is found in an unfortunately anonymous legal opinion on the permissibility of smoking.<sup>70</sup> While the unnamed scholar grants the opinion of medical experts full authority, the opinion is of additional interest due to its explicit admission of the case of tobacco being without precedent. The question itself is curious: in the case of a sick man who, with the help of God, has managed to stop smoking, is he unconditionally permitted to smoke for medical purposes (*hal yajūz lahu ta'āṭihu muṭlaqan*) or only when he doesn't feel a need to smoke? The questioner has addressed two issues here: the medical value of smoking tobacco and the problem of addiction. Before addressing these, the *muftī* reflects on the desirability of smoking:

Smoking [tobacco] did not exist in the time of the Prophet, nor in the time of the Rightly-Guided Caliphs after him, nor in the time of the Companions or the Followers, nor for the four Mujtahid *imams* or their companions. Instead it occurred in the tenth century [of the hijra], the scholars of which differed then and afterwards. Of them there was he who gave a *fatwā* for it to be forbidden, there was he who gave a *fatwā* on its being reprehensible, and he who gave a *fatwā* on its being permitted. Each one of these sought in his *fatwā* indications [to support his argument]. This is one of the issues in which there is doubt (*al-mushabbahāt*), regarding which the Prophet said: 'Whoever is on his guard against them, preserves his religion and honor (*istabra'a li-dīnihi wa-'irdīhi*).'<sup>71</sup> So it is piety to refrain from it, and it is recommended to refrain from it, and one should trust in what is recommended (*nadhr al-mandūb yajib al-wafā' bi-hi*). So know that this person should not ingest it, due to the Prophet's warning that avoiding it is recommended, and considering that (*mu'allaqan*) the cure had already taken place. It is necessary for him to have faith in the Prophet's warning.<sup>71</sup>

Our jurist is clearly skeptical of the claim that tobacco has medical properties, for he warns of the recovering addict's desire for smoking, and then notes that the foremost physicians (*ḥudhdhāq al-aṭibbā'*) have decried the possibility of any good coming from smoking, stating

---

Islamic thought, see Katz, "The Problem of Abortion in Classical Sunni *Fiqh*" (with a brief discussion of al-Mawwāq's *fatwā*), and Musallam, *Sex and Society in Islam*.

<sup>70</sup> Surprisingly little has been written on the status of smoking in Islamic law. For a discussion of two treatises from the sixteenth and seventeenth centuries on tobacco, neither of which invokes the authority of medical knowledge, see Klein-Franke, "No Smoking in Paradise." For an overview of the status of drugs in *shari'a*, in which the author unfortunately does not discuss tobacco, see Opwis, "Scharierechtliche Stellungnahmen zum Drogenverbot."

<sup>71</sup> al-Wazzānī, *al-Mi'yār al-jadīd*, 2:554.

that it instead causes sicknesses that could not be acquired otherwise. Smoking, he argues, “is the sickness for which there is no medicine except giving it up and renouncing it, like the whispering of the accursed Satan”.<sup>72</sup> Unfortunately, without more knowledge about the author, it is difficult to know which medical experts he had in mind when writing his opinion.

*Conclusion: Towards a Definition of a Public Discourse on Science*

Here I will simply assert, but later will argue, that much of our sense of the world’s contents and inductive regularities is built up and protected by the constitutively moral processes by which we credit others’ relations and take their accounts into our stock of knowledge about the world.

To trust people is to perform a moral act, proceeding on the basis of what we know about people, their makeup and probable actions with respect to our decisions. Insofar as knowledge comes to us via other people’s relations, taking in that knowledge, rejecting it, or holding judgment in abeyance involves knowledge of *who these people are*... What of relevance to credibility assessment do we know about them as individuals and as members of the same collectivity?

Stephen Shapin, *A Social History of Truth*<sup>73</sup>

In the past decades, the work of Stephen Shapin has been influential in rethinking the nature of the scientific revolution in Western Europe, and in offering a productive sociological perspective on how and when seventeenth-century scientists chose to believe their colleagues. To be sure, Shapin benefited from being able to build on the tremendous amount of scholarly attention previous generations of scholars had devoted to this period in European intellectual history. Scholars of the early modern Muslim world find themselves in a decidedly less advantageous position, especially regarding the ways in which the natural sciences were discussed by Muslim intellectuals active in law, mysticism, theology, and philosophy during the period from the fifteenth to the nineteenth centuries, a period that includes what European historians often call “early modern.” To reiterate an oft-heard lament, many of our sources, insofar as they exist or have been identified, continue

<sup>72</sup> Ibid.

<sup>73</sup> Shapin, *A Social History of Truth: Civility and Science in Seventeenth-Century England*, 8, 38.

to languish in manuscript or have been published too recently to have attracted substantive comment.

In this brief essay, I have argued that, as part of a larger project of investigating the status and place of science in the Muslim world, it is both productive and valuable to investigate the legal status of science during the period in question. Though the legal opinions of the scholars here are far from univocal, their discussions of astronomy, alchemy, and medicine repeatedly show an ability and desire to support science's legitimate authority, while ensuring that it not be understood in a fashion that would challenge proper piety. No conclusive generalizations can be drawn from these few opinions, however intriguing they may be. Above all, the substantial chronological range of material drawn upon here, comparing *fatwās* from over almost a thousand years, suggests that a much larger number of legal opinions would need to be included in future studies in order to ascertain general attitudes which may have characterized given generations of scholars. In addition, the *fatwās* discussed here and others like them should be discussed in connection with works traditionally assigned to other scholarly genres, such as Sufism, theology and philosophy. The example given above of al-Yūsī is especially instructive. Here, an author of works on law, mysticism, theology, and *belles lettres* argues in broad terms that the pursuit of all knowledge that benefits the Muslim community is legitimate and should be pursued.<sup>74</sup> Such an example suggests that Sabra's tentative suggestion that science in the Muslim world may have in part declined as it became "naturalized" needs revision and emendation.

As mentioned in the introduction, the scholarship of the past few decades has demonstrated that Islamic law remained dynamic and flexible after the formation of law schools in the fifth/eleventh century. This flexibility is well illustrated in the *fatwās* examined here, with individual jurists drawing creatively on both legal and scientific precedents in order to craft authoritative opinions that reflect both the jurists' interpretation of the intention of the scriptural sources, and the exigencies of the Muslim community. Yet, while the old stereotypes of Islamic law's static or arbitrary nature can now be safely discarded, all too often scholars continue to treat developments in legal discourses

---

<sup>74</sup> For al-Yūsī's exceptional views on *kalām* and the problem of contagion, see Stearns, "Infectious Ideas," 149–50.

in isolation, not considering possible relationships of mutual influence with developments in, for example, *kalām* or Sufism. An accurate understanding of science during the early modern period will only be attained when our understanding of all the facets of the period's intellectual history are considerably deepened. Only in this manner can we begin to move towards what Stephen Shapin has referred to as "a moral history of scientific credibility" with regard to science in the early modern Muslim world, and hope to come to a better understanding of how authoritative knowledge was constructed, not solely in the written records of the legal or scientific realms, but also in the public spheres where both were discussed and debated.<sup>75</sup>

### Bibliography

- al-Azharī, Šāliḥ 'Abd al-Samī' al-Ābī. *Jawāhir al-iklīl 'alā mukhtaṣar al-imām Khalīl*. Beirut: al-Maktaba al-ʿAṣriyya, 2000.
- al-Burzulī, Abū al-Qāsim. *Fatāwā*. Beirut: Dār al-Gharb al-Islāmī, 2002.
- Commins, David. *The Wahhabi Mission and Saudi Arabia*. London: I.B. Tauris, 2006.
- Conrad, Lawrence. "A Ninth-century Muslim Scholar's Discussion of Contagion." In *Contagion: Perspectives from Pre-Modern Societies*, edited by Lawrence Conrad and Dominik Wujastyk, 163–77. Aldershot: Ashgate, 2000.
- Crombie, A.C. "Review of *The Rise of Early Modern Science*." *The Journal of Asian Studies* 53 (1994): 1213–15.
- Dols, Michael. "The Leper in Medieval Islamic Society." *Speculum* 58 (1983): 891–916.
- Elman, Benjamin. "Review of *The Rise of Early Modern Science*." *The American Journal of Sociology* 100 (1994): 817–19.
- El-Rouayheb, Khaled. "Sunni Muslim Scholars on the Status of Logic, 1500–1800." *Islamic Law and Society* 11 (2004): 213–32.
- Fadel, Mohammad. "The Social Logic of *Taqlīd* and the Rise of the *Mukhtaṣar*." *Islamic Law and Society* 3 (1996): 193–233.
- . "Adjudication in the Mālikī *Madhhab*: a Study of Legal Process in Medieval Islamic Law." Dissertation, University of Chicago, 1996.
- Fernández Félix, Ana. *Cuestiones legales del Islam temprano: La 'utbiyya y el proceso de formación de la sociedad islámica andalusí*. Madrid: CSIC, 2003.
- García Gómez, Emilio. *Foco de antigua luz sobre la Alhambra*. Madrid: Publicaciones del Instituto Egipcio de Estudios Islámicos en Madrid, 1988.
- Hallaq, Wael B. "*Iftā'* and *Ijtihād* in Sunni Legal Theory: A Developmental Account." In *Islamic Legal Interpretation: Muftis and their Fatwas*, edited by Muhammad Khalid Masud, Brinkley Messick and David S. Powers, 31–43. Cambridge: Harvard University Press, 1996.
- al-Harbī, Mubārak Jazā'. "Namādhij min juhūd fuqahā' al-mālikiyya al-maghārība fī tadwīn al-nawāzil al-fiqhiyya." *Majallat al-Sharī'a wa-l-Dirāsāt al-Islāmiyya* 21 (2006): 281–364.

<sup>75</sup> Shapin, *A Social History of Truth*, xxix.

- Henry, John. "Review of *The Rise of Early Modern Science*." *The British Journal for the History of Science* 28 (1995): 101–2.
- al-Hilal, Muḥammad al-Habib. "Classification of Andalusian and Maghribi books of *Nawāzil* from the Middle of the Fifth to the End of the Ninth Century AH." In *The Significance of Islamic Manuscripts*, edited by John Cooper, 71–78. London: Islamic Heritage Foundation, 1992.
- Huff, Toby. *The Rise of Early Modern Science: Islam, China, and the West*. Cambridge: Cambridge University Press, 2003.
- . "The Rise of Early Modern Science: A Reply to George Saliba." *Bulletin of the Royal Institute for Inter-Faith Studies* 4 (2002), [http://www.riifs.org/review\\_articles/review\\_v1no2\\_sliba.htm](http://www.riifs.org/review_articles/review_v1no2_sliba.htm) (accessed 5/15/08).
- Ibn al-Hājj. *al-Madkhal al-sharī al-sharīf 'alā-l-madhāhib*. Cairo: Dār al-Fikr, 1981.
- ʿIyāḍ b. Mūsā al-Qāḍī. *Tartīb al-Madārik*. Tripoli: Maktabat al-Ḥayāt, 1968.
- Jackson, Sherman A. *Islamic Law and the State: The Constitutional Jurisprudence of Shihāb al-Dīn al-Qarāfī*. Leiden: Brill, 1996.
- Kaḥḥāla, ʿUmar Riḍā. *Muʿjam al-muʿallifin*. Beirut: Muʿassasat al-Risāla, 1993.
- Katz, Marion Holmes. "The Problem of Abortion in Classical Sunni *fiqh*." In *Islamic Ethics of Life: Abortion, War, and Euthanasia*, edited by Jonathan E. Brockopp, 25–50. Columbia: South Carolina Press, 2003.
- King, David. *In Synchrony with the Heavens: Studies in Astronomical Timekeeping and Instrumentation in Medieval Islamic Civilization*. Leiden: Brill, 2004.
- . "On the Role of the Muezzin and Muwaqqit in Medieval Islamic Societies." In *In Synchrony with the Heavens* (see previous entry), 628–77.
- . "On the History of Astronomy in the Medieval Maghrib," in *Etudes philosophiques et sociologiques dédiées à Jamal ed-Dine Alaoui*, 27–61. Fez: Université Sidi Mohamed Ben Abdallah, Publications de la Faculté des Lettres et des Sciences Humaines Dhar El Mahraz (Numéro Spécial 14), 1999.
- . "The Origin of the Astrolabe According to the Medieval Islamic Sources." In *Islamic Astronomical Instruments*, 44–83 (III). London: Variorum, 1987.
- Klein-Franke, F. "No Smoking in Paradise: The Habit of Tobacco Smoking Judged by Muslim Law." *Le Muséon* 106 (1993): 155–83.
- Lindberg, David. "Review of *The Rise of Early Modern Science*." *Speculum* 70 (1995): 390–92.
- Lohlker, Rüdiger. *Islamisches Völkerrecht: Studien am Beispiel Granada*. Bremen: Kleio Humanitas, 2006.
- Major, John. "Review of *The Rise of Early Modern Science*." *Isis* 85 (1994): 675–76.
- Masud, Muhammad Khalid, Brinkley Messick and David S. Powers, eds. *Islamic Legal Interpretation: Muftis and their Fatwas*. Cambridge: Harvard University Press, 1996.
- al-Māzarī, Muḥammad. *Sharḥ al-Talqīn*. Edited by Muḥammad al-Mukhtār al-Salāmī. Beirut: Dār al-Gharb al-Islāmī, 1997.
- Melchert, Christopher. *The Formation of the Sunni Schools of Law, 9th-10th Centuries C.E.* Leiden: Brill, 1997.
- Moosa, Ebrahim. "Shaykh Ahmad Shākir and the Adoption of a Scientifically-based Lunar Calendar." *Islamic Law and Society* 5 (1998): 57–89.
- Musallam, Basim. *Sex and Society in Islam: Birth Control before the Nineteenth Century*. Cambridge: Cambridge University Press, 1983.
- Opwis, Felicitas. "Schariatrechtliche Stellungnahmen zum Drogenverbot." *Die Welt des Islams* 39 (1999): 159–82.
- Perho, Imerli. *The Prophet's Medicine: A Creation of the Muslim Traditionalist Scholars*. Helsinki: The Finnish Oriental Society, 1995.
- Pormann, Peter and Emilie Savage-Smith. *Medieval Islamic Medicine*. Georgetown: Georgetown University Press, 2007.

- Pormann, Peter. "The Physician and the Other: Images of the Charlatan in Medieval Islam." *Bulletin of the History of Medicine* 79 (2005): 189–227.
- Powers, David. *Law, Society, and Culture in the Maghrib, 1300–1500*. Cambridge: Cambridge University Press, 2002.
- Restivo, Sal. "Review of *The Rise of Early Modern Science*." *Social Forces* 75 (1996): 364–65.
- Sabra, A.I. "Situating Arabic Science: Locality versus Essence." *Isis* 87 (1996): 654–70.
- . "Science and Philosophy in Medieval Islamic Theology: The Evidence of the Fourteenth Century." *Zeitschrift für Geschichte der arabisch-islamischen Wissenschaften* 9 (1994): 1–42.
- . "The Appropriation and Subsequent Naturalization of Greek Science in Medieval Islam: A Preliminary Statement." *History of Science* 25 (1987): 223–43.
- Saliba, George. *Islamic Science and the Making of the European Renaissance*. Cambridge: The MIT Press, 2007.
- . "Flying Goats and Other Obsessions: A Response to Toby Huff's 'Reply.'" *Bulletin of the Royal Institute for Inter-Faith Studies* 4 (2002), [http://www.riifs.org/review\\_articles/review\\_v1no2\\_sliba.htm](http://www.riifs.org/review_articles/review_v1no2_sliba.htm) (accessed 5/15/08).
- . "Seeking the Origins of Modern Science?" *Bulletin of the Royal Institute for Inter-Faith Studies*, v. 1 (1999), [http://www.riifs.org/review\\_articles/review\\_v1no2\\_sliba.htm](http://www.riifs.org/review_articles/review_v1no2_sliba.htm) (accessed 5/15/08).
- . "The Role of the Astrologer in Medieval Islamic Society." *Bulletin d'Etudes Orientales* 44 (1992): 45–67.
- Shapin, Stephen. *A Social History of Truth: Civility and Science in Seventeenth-Century England*. Chicago: University of Chicago Press, 1994.
- Stearns, Justin. "Infectious Ideas: Contagion in Medieval Islamic and Christian Thought." Dissertation, Princeton University, 2007.
- . "Contagion in Theology and Law: Ethical Considerations in the Writings of Two 14th-Century Scholars of Naṣrid Granada." *Islamic Law and Society* 14 (2007): 109–29.
- Vikor, Kunt S. *Between God and the Sultan: A History of Islamic Law*. Oxford: Oxford University Press, 2005.
- al-Wansharīsī, Aḥmad b. Yahyā. *al-Mi'yār*. Rabat: Dār al-Gharb al-Islāmī, 1981.
- al-Wazzānī, Abū 'Īsā. *al-Mi'yār al-jadīd al-jāmi' al-mu'rib 'an fatāwā al-muta'akhhirīn min 'ulamā' al-maghrib*. Rabat: Dār al-Ḥadīth al-Ḥasaniyya, 1996–97, 4 vols.
- Wiederhold, Lutz. "Legal Doctrines in Conflict: the Relevance of Madhhab Boundaries to Legal Reasoning in the Light of an Unpublished Treatise on Taqlīd and Ijtihād." *Islamic Law and Society* 3 (1996): 234–304.
- Wisnovsky, Robert. "The Nature and Scope of Arabic Philosophical Commentary in Post-Classical (ca. 1100–1900 AD) Islamic Intellectual History: Some Preliminary Observations." In *Philosophy, Science and Exegesis in Greek, Arabic and Latin Commentaries*, edited by Peter Adamson, H. Baltussen and M.W.F. Stone, 149–191. London: Institute of Classical Studies, 2004.
- al-Yūsī, Ḥasan. *al-Qānūn fī aḥkām al-'ilm*. Rabat: Maṭba'at Shālat Rabāṭ, 1998.