ASTROLOGY IN THE SERVICE OF THE EMPIRE:
KNOWLEDGE, PROGNOSTICATION, AND POLITICS AT THE OTTOMAN COURT,
1450s–1550s

A DISSERTATION SUBMITTED TO
THE FACULTY OF THE DIVISION OF THE HUMANITIES
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### Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>BEA</td>
<td>The Biographical Encyclopedia of Astronomers</td>
</tr>
<tr>
<td>BML</td>
<td>Biblioteca Medicea Laurenziana</td>
</tr>
<tr>
<td>BnF</td>
<td>Bibliothèque Nationale de France</td>
</tr>
<tr>
<td>BOA</td>
<td>Başbakanlık Osmanlı Arşivleri</td>
</tr>
<tr>
<td>EI²</td>
<td>Encyclopedia of Islam, second edition</td>
</tr>
<tr>
<td>EI³</td>
<td>Encyclopedia of Islam, third edition</td>
</tr>
<tr>
<td>EI₉</td>
<td>Encyclopediad Iranica</td>
</tr>
<tr>
<td>IRCICA</td>
<td>Research Centre for Islamic History, Art, and Culture in Istanbul</td>
</tr>
<tr>
<td>İA</td>
<td>Milli Eğitim Bakanlığı İslam Ansiklopedisi</td>
</tr>
<tr>
<td>İÜ</td>
<td>İstanbul Üniversitesi</td>
</tr>
<tr>
<td>OALT</td>
<td>Osmanlı Astronomi Literatürü Tarihi</td>
</tr>
<tr>
<td>OASTLT</td>
<td>Osmanlı Astroloji Literatürü Tarihi</td>
</tr>
<tr>
<td>SK</td>
<td>Süleymaniye Kütüphanesi</td>
</tr>
<tr>
<td>TDVİA</td>
<td>Türkiye Diyanet Vakfı İslam Ansiklopedisi</td>
</tr>
<tr>
<td>TOEM</td>
<td>Tarih-i Osmanî Encümeni Mecmuası</td>
</tr>
<tr>
<td>TSMA</td>
<td>Topkapı Sarayı Müzesi Arşivi</td>
</tr>
<tr>
<td>TSMK</td>
<td>Topkapı Sarayı Müzesi Kütüphanesi</td>
</tr>
<tr>
<td>TTK</td>
<td>Türk Tarih Kurumu</td>
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Notes on Transcription and Dates

For the Romanization of texts written in Arabic, Persian, and Ottoman Turkish, I used a slightly modified version of the conventional transliteration system established by the *IJMES* (*International Journal of Middle Eastern Studies*). The modification I applied is as follows: In [خ] for [خ] in Ottoman Turkish I used [h] instead of [h].

For the ease of readers, I have included the transliterations of all passages that I partially or fully translated from primary sources. Some of my readings are necessarily tentative, thus I will appreciate if the wider scholarly community may offer alternative readings to my work.

Turkish words in Arabic and Persian texts, and some of the common appellations still used in modern Turkish are transliterated according to the conventions of modern Turkish. Hence Beg not Bığ; Paşa not Pāshā; or Çelebi, not Çelbî. This holds true for the Anglicized versions of the place names.

I follow the rules of Arabic transliteration whenever I refer in the main text to some terms or concepts common in all three languages. The reader will thus find *taqwîm* and not *takvim*; *munajjim* not *müneccim*; *muwaqqit* not *muvakkit*; ‘ulâmā’ not *ulema*; or *mudarris* not *müderris* when these words are used in the main body in isolation from particular text or context. The use of original words for the terms instead of their equivalence in English is a deliberate choice for the purposes of this dissertation, as words and phrases commonly used in English do not always fully capture their historical and cultural nuances. For the extended quotations from original sources provided in the footnotes, however, I transliterate the words according to the language conventions in which the original passage was written. Therefore the readers should not consider it an inconsistency to find in these quoted passages such multiple uses as *taqwîm* (Arabic).
taqvīm (Persian), and takvīm (Ottoman Turkish), because each one is transliterated according to the transliteration conventions of the language in which the original passage is written.

With regard to the names of individuals transliterated in the Roman alphabet, I also try to follow the transliteration conventions of the language that predominated in the context of the concerning individual’s activity. Thus, the names of those individuals particularly tied to the Ottoman context are transliterated using the Turkish guidelines, and others according to their own contentions. (Hence Meḥmed II not Muḥammad II; Ṭaṣḵoḵrīzāde not Ṭāšḵuḵrīzāda; Yūsuf b. Ömer el-Sā’atī not Yūsuf b. ʿUmar al-Sā’atī; or Shukrullah Shirvānī not Shirwānī). It is not always easy, however, to detect in which linguistic context did the individual flourish. This is especially true for the period (i.e. from the mid-fifteenth to the mid-sixteenth century) and subject matter (i.e. émigré scientists and munajjims) examined in this dissertation. The constant flow of scholars from one particular geographic context to another where the cultural and linguistic boundaries were much more fluid than currently presumed present a major challenge. Could we really assume, for instance, Qāḏīzāda-i Rūmī or ʿAlī Qūshjī as “Ottoman” astral experts, while the whole cultural and political concept of “Ottoman” was still in the making and while these individuals are known to have gained prominence in different politico-cultural contexts? Keeping this challenge always in mind, in such cases where the name and epithet of the individual give an idea about his linguistic background and context, I follow the transliteration conventions of that particular language. (Hence Salmān-i ʿAjam, not Selmān-i ʿAcem; Necmeddīn b. Seyyid Muḥammad from Bursa, not Najm al-Dīn b. Sayyid Muḥammad, or Mevlānā Kūček el-Amāsī, not Mawlānā Kūchak al-Amāsī).

Dates are given according to the Common Era unless otherwise is specifically noted.
Abstract

This dissertation explores the intellectual, cultural, and political history of knowledge in the late-medieval and early modern Ottoman context by examining the fifteenth-and sixteenth-century Ottoman astrological corpus. This corpus consists primarily of taqwīms (almanac-prognostications), occasional horoscopes, textbooks imparting astrological principles, and the examples of the zij literature written in Persian and Ottoman Turkish. This dissertation argues that exploring hitherto neglected astrological sources and visiting the lives of hitherto marginalized astral experts (munajjims) provides important insights into the intersecting dynamics of science, politics, and culture in the late-medieval and early modern Ottoman and Islamicate culture.

This study consists of three major parts, each undertaken with a combination of different historiographical approaches. The first part (Chapter 1) examines the intellectual and cultural history of astrological practice in the late-medieval and early modern Islamicate culture. I argue that contrary to the scholarly convictions in the historiography of Arabic science, astrology retained its prestigious status as a learned discipline with complex astronomical and mathematical underpinnings. The heightened interest during this period in the eastern Islamic lands in conducting observational enterprises and updating the available celestial data in the astronomical tables was inextricably related to the need for undertaking more accurate practice of astrology.

The second part (Chapter 2 and Chapter 3) of the dissertation focuses on the social history of munajjims in the Ottoman realm and tries to understand the complex social and patronage dynamics within which they functioned. By tracking their career trajectories from their
vocational training to professional service, this part addresses several questions about the contents, mechanisms, and institutional structures of learning and practicing astrologically valid knowledge.

The third, and the last, part (Chapter 4 and Chapter 5) examines in a detailed fashion the personal and political implications of the ever-changing textual contents and constituents of almanac-prognostications (*taqwil*) and other occasional horoscopes. By documenting the political significance and public recognition of astrological prognostications, this part demonstrates the ability of often-marginalized astrological texts to provide surprising complementary details about the early modern Ottoman political culture.
Introduction—The Study of “Wretched Subjects” in the Early-Modern Ottoman History

In 1950, George Sarton, who is usually considered the true founder of the modern academic discipline of the history of science, wrote a brief review of a book on Mandaean astrology. Reflecting the general scholarly biases of his time, Sarton dismissed the work as a “wretched collection of omens, debased astrology and miscellaneous nonsense ultimately derived from Arabic, Greek, Persian and of all the superstitious flotsam of the Near East.”¹ For Sarton, modern historical scholarship should not take seriously the astrological and cognate divinatory texts, unless they are instrumentally used to illustrate the progress of human civilization. For instance, in his own three-volume magnum opus, Introduction to the History of Science, Sarton justified the reasons he had to refer in his study to astrology and other “intellectual delusions” by saying that it is not possible to outline “the progress [of humanity] without giving … a brief account of the intellectual delusions, which often delayed our advance or threatened to sidetrack it.”²

No later than a year after Sarton published his book review, another important historian of science Otto Neugebauer, himself the leading authority on ancient mathematics and astronomy, wrote a one-page long reply to Sarton under the title “The Study of Wretched Subjects.” In his short but influential reply Neugebauer condemned his colleague’s stance and

¹ George Sarton and Frances Siegel, “Seventy-Sixth Critical Bibliography of the History and Philosophy of Science and of the History of Civilization,” Isis 41/3-4 (1950), 328-424, these words are found on page 374. The work reviewed by Sarton was Ethel Stefana Drower’s study entitled “The Book of the Zodiac: Sfar Malwa`sia.”
² George Sarton, Introduction to the History of Science, v. 1 From Homer to Omar Khayyam (Baltimore: The Williams and Wilkins Company, 1927).
pointed out the importance of studying these texts, which, he wrote, provide “an insight into the
daily life, religion and superstition, and astronomical methods and cosmogonic ideas” of
individuals living in the past. For Neugebauer, Sarton’s words destroy the very foundations of
historical and philological studies, that is, “the recovery and study of the texts as they are,
regardless of our own tastes and prejudices.”

Although it is difficult to say that Neugebauer’s insightful remarks have decisively won
the battle in modern scholarship, over the last few decades a substantial amount of literature has
accumulated especially in European historiography, acknowledging the significance of
astrological sources for historical purposes. Since astrology, as a focal point of medieval and
early modern worldview, had repercussions in a wide array of contexts ranging from social and
political to intellectual and cultural, different studies have highlighted diverse aspects to which
the study of astrological practice and textual, as well as visual artifacts could be applied. Several
studies have examined, for instance, the courtly interest in astrology from the perspective of the
political and ideological claims of medieval and early-modern dynasties. Historians of science
scrutinized the influence of astrological concerns and activities on the development of new
astronomical theories and instruments. Cultural and intellectual historians have explored the

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4 While the literature on the topic is vast, I find the following monographs useful due to their
relevance with regard to the questions about the courtly patronage of astrology in the early
modern Ottoman context: Hillary M. Carey, *Courting Disaster: Astrology at the English Court
and University in the later Middle Ages* (New York: St. Martin’s Press, 1992); Monica Azzolini,
*The Duke and the Stars: Astrology and Politics in Renaissance Milan* (Cambridge, Mass.:
Harvard University Press, 2013); Darin Hayton, *The Crown and the Cosmos: Astrology and the
5 For the role of astrological preoccupations in Copernicus’ scientific endeavors, see: Robert S.
Westman, *The Copernican Question: Prognostication, Skepticism, and Celestial Order*
(Berkeley: University of California Press, 2011). The same also applies for Kepler, another
complex social and intellectual dynamics underlying the scientific enterprises of past astrologers and their professional careers. Many social and religious historians have delved into the heated debates among the learned individuals of the medieval and early modern times as regards to the epistemological validity and religious permissibility of astrology. The role accorded to the astrological theory and practice within the broader religious and apocalyptic discussions of the late medieval and early modern European world has also received substantial scholarly consideration. Last but not least, the ways through which astrological symbolism was visually expressed have grasped the attention of art historians.

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In the Ottoman, and to a certain extent Islamic studies, however, the old Sartonian reluctance has dominated the field, preventing scholars from recognizing astrology as a legitimate object of historical study, and astrological texts as valuable historical documents. This modern scholarly disdain has several reasons, the foremost of which is the “embarrassment factor” that pushes researchers, especially the historians of science and intellectual historians, to pass over astrological materials in silence, lest these texts and documents reproduce the Orientalist perceptions as regards to the overall incompatibility of exact, rational sciences with Islamic doctrines. Ever since the late nineteenth century when French orientalist Ernest Renan gave his controversial lecture “L’islamisme et la Science” in which he argued that Islam is inherently irrational and essentially incapable of producing real “science”, “Muslim” scholars and modern historians of “Arabic” sciences have gone to great lengths to disprove this line of thinking. Although the scholarship that has pointed out the global importance of the “scientific” achievements attained in the Islamicate past, especially in the so-called post-classical era, is a welcome development that helps unseat the established misperceptions and Orientalist biases about the perennial question of science vs. religion (or read Islam), the excessive emphasize upon the “legitimate sciences” —legitimate in the sense of modern, positivist, progressive scientific standards— has inevitably led to the marginalization of astrological materials in relevant historical studies.


With respect to the trends in modern Ottoman studies, the dearth of scholarly interest in
Ottoman astrological materials is not surprising indeed, given the fact that throughout the almost
century-long history of modern Ottoman historiography, cultural and intellectual history as well
as the history of science have attracted much less attention as opposed to the political, social, and
economic history.\footnote{For the brief history of the trends in modern Ottoman historiography, see: Oktay Özel and Gökhan Çetinsaya, “Türkiye’de Osmanlı Tarihçiliğinin Son Çeyrek Yüzyılı: Bir Bilanço Denemesi,” Toplum ve Bilim 91 (2001-2), 8-38.} \footnote{Adnan Adıvar, La Science chez les Turcs Ottomans (Paris: Maisonneuve, 1939). The work was translated in the early 1940s into Turkish with substantial additions. See: Adnan Adıvar, Osmanlı Türklerinde İlim (İstanbul: Maarif Matbaası, 1943). In October 2015, Miri Shefer-Mossensohn published the second derivative work —with limited use of new primary sources— on the Ottoman scientific enterprises. See: Miri Shefer-Mossensohn, Science among the Ottomans: The Cultural Creation and Exchange of Knowledge (Austin, TX: University of Texas Press, 2015). In between the works of Adıvar and Shefer-Mossensohn, one may also consider consulting Ekmeleddin İhsanoğlu’s collected essays in Science, Technology, and Learning in the Ottoman Empire (Aldershot, UK: Ashgate Variorum, 2004).} Up until October 2015 the only attempt to produce a general survey book on
the history of science in the Ottoman world was that of Adnan Adıvar’s brief survey, La Science
chez les Turcs Ottomans, which he first published in 1939 with a certain teleological bent
characteristic of the time.\footnote{Up until 2011, IRCICA completed the following published catalogues: History of Astronomy Literature during the Ottoman Empire (in 1997) in two volumes, History of Mathematical Literature during the Ottoman Empire (in 1999) in two volumes, History of Geographical Literature during the Ottoman Empire (in 2000) in two volumes, History of Music Literature during the Ottoman Empire (in 2003) in one volume, History of Military Art and Science} It is true that since the publication of Adıvar’s book, many individual
contributions have appeared in the history of astronomy, mathematics, medicine, geography, or
applied sciences; and from the mid-1980s on, thanks to the collaborative research projects
coordinated by the Research Centre for Islamic History, Art, and Culture (IRCICA) in Istanbul, a
series of reliable bio-bibliographical catalogs have been produced to inventorize all the available
scientific manuscripts from the Ottoman period.\footnote{In all these scholarly efforts, however,}
astrology and sister divinatory sciences have received the minimum possible scholarly attention. It is highly telling that in his preface to the latest issue of the IRCICA’s catalog series, which was published in 2011 with the aim of introducing Ottoman astrological lore, Ekmeleddin İhsanoğlu expressed, as the editor of the catalogue series, a late apology for having deliberately dismissed such a rich body of astrological materials for so long:

“While we were preparing the first two volumes on astronomy we had chosen to leave aside the works on astrology on account of the latter generally being considered as an ‘occult science.’ This was due to our understanding of the sciences at the time: our intention was to exclude astrology from the body of sciences that are based on observation and experiment and to consider it a ‘pseudo-science.’ But quite a long time passed since then, and given the maturity presently reached in history of science studies we believe that it was not the right choice and we are compensating for it now as we complete the series.”

The scientific activities among the Ottomans, including the so-called “pseudo-scientific” practices of astrology and divination, did not only escape the attention of the Ottoman historians. The broader and more established field of the history of science, learning, and knowledge in the past Islamic societies has also generally underestimated the Ottoman scientific enterprises at the expense of underlining the “Arabic” scientific production during the so-called “classical” era or the “Golden Age.” Although in the past two decades a number of important works have appeared that are critical of the infamous “decline paradigm,” the narrative that still prevails—maybe less so in the current academic environment than in more popular media—is the one recounting that

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Literature during the Ottoman Empire (in 2004) in two volumes, History of the Literature of Natural and Applied Sciences during the Ottoman Empire (in 2006) in two volumes, History of the Literature of Medical Sciences during the Ottoman Empire (in 2008) in four volumes, and History of Ottoman Astrology Literature (in 2011) in one volume.

15 Osmanlı Astroloji Literatürü Tarihi ve Osmanlı Astronomi Literatürü Tarihi Zeyli/History of Ottoman Astrology Literature (from now on OASTLT), ed. Ekmeleddin İhsanoğlu (İstanbul: IRCICA, 2011), xxvii.
roughly between the ninth and twelfth centuries, the intellectual and scientific activities in the Islamic world peaked and yielded the most important scientific achievements of the Islamic civilization, and that this scientific vitality and productivity was gradually replaced, from Ghazālī (d. 1111) onwards, by religious conservatism and traditionalism.\(^{16}\)

Interesting enough, the available scholarship on the history of astrology in the pre-modern Islamic world does not escape the established Golden Age rhetoric. Over the past few decades, thanks especially to the meticulous efforts of David Pingree, Richard Lemay, Charles Burnett, Michio Yano, and Keiji Yamamoto, some of the major texts of Islamic astrological canon such as the works of Mashā’ullāh (d. 815), Abū Ma’shar (d. 886), al-Qabīṣī (d. 967), and Kūshyār (d. 1029) have been edited, annotated, and translated into English or Latin.\(^{17}\) Moreover, David Pingree has shed much light upon the transmission of astrological theories and concepts from the Indian, Sassanian, and Hellenistic traditions into the early Islamic realm.\(^{18}\) The controversial status of astrologers in medieval Islamic society, their courtly presence and services for their clients have also been treated in a few case studies that I will discuss in greater detail in the third chapter. However, with their implicit focus upon “Arabic” astrological sources produced in the so-called “classical” period of Islamic history, these valuable contributions either


\(^{17}\) See the Bibliography for the compete list of edited-published astrological sources.

intentionally or accidentally reproduce the narrative of the “Golden Age.” Even the encyclopedic works of Manfred Ullmann and Fuat Sezgin on the major astrological sources in the Islamic past easily manifest that the production of astrologically significant materials after the twelfth century in languages other than Arabic is not necessarily deemed worthy of examination.¹⁹

Reproducing the “Golden Age” rhetoric is not the only pitfall of current scholarship. The astrological texts that have been edited and studied so far seem mostly to be textbooks that impart the basic theoretical knowledge about the universal rules and principles of the nature and characteristics of the planets, zodiacal signs, and other celestial phenomena. We should not forget, however, that astrology was an applied science that drew on sophisticated astronomical and mathematical knowledge, and was put in use for concrete purposes. Therefore these textbooks, albeit their immense value in regard to their content, present very little on how astrology was actually practiced for specific occasions. For that purpose one should look at a wide array of texts ranging from the zījes (astronomical handbook of tables) that provided necessary mathematical-astronomical information for making astrological calculations, to other and more context-dependent forms of astrological production like annual almanac-prognostications (taqwīms) and occasional horoscopes.²⁰ These types of sources are crucial, because they illustrate how astrology was put into concrete practice in a particular milieu; as such they are by nature responsive to and representative of their immediate historical, political, and cultural contexts. Moreover, these texts provide invaluable information for inquiries into the

²⁰ Relevant information on modern studies about the zījes is given in the first chapter where I will discuss in greater detail the importance of these texts for astrological calculations.
cross-cultural scientific exchanges and developments, as they document which astronomical sources (zījes) and astrological theories were utilized by different munajjims at different times.

I should note here that in terms of the availability of extant astrological materials from diverse genres, historians from other subfields of the Islamic studies are not as fortunate as their Ottomanist counterparts. The amount of taqwīms (almanac-prognostications), occasional horoscopes, and manuals for astrological practice currently held in major manuscript libraries in Turkey and elsewhere outnumber any set of extant astrological materials from other parts and periods of the Islamic past. For example the best bibliographical sources on surviving Ottoman taqwīms, IRCICA’s Osmanlı Astroloji Literatürü Tarihi and the two volumes of Kandilli Rasathanesi El Yazmaları Kataloğu, list more than 200 almanac-prognostications composed during the period 1421-1850. This list is far from complete, as many taqwīms have been certainly lost altogether and/or some additional ones doubtless survive undiscovered within obscure collections. IRCICA’s same catalogue also locates a handful of nativities produced for members of the Ottoman house. We should add to these manuscript sources related archival documents now kept primarily in the Prime Ministry Ottoman archives (Başbakanlık Osmanlı Arşivleri), and to a lesser extent in the Topkapı Palace Museum Archive (Topkapı Sarayi Müzesi Arşivi). These archival documents include petitions written by the court munajjims, registers of expenses listing their salaries, and brief astrological memos delivered by astrologers at the behest of different parties from the ruling elites.

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21 Günay Kut, Kandilli Rasathanesi el yazmaları : Boğaziçi Üniversitesi Kandilli Rasathanesi ve Deprem Araştırma Enstitüsü astronomi, astroloji, matematik yazmaları kataloğu 1 – Türkçe Yazmalar (İstanbul: Boğaziçi Üniversitesi Yaynevi, 2007); Ibid., Kandilli Rasathanesi el yazmaları : Boğaziçi Üniversitesi Kandilli Rasathanesi ve Deprem Araştırma Enstitüsü astronomi, astroloji, matematik yazmaları kataloğu 2 – Arapça ve Farsça Yazmalar (İstanbul: Boğaziçi Üniversitesi Yaynevi, 2013); OASTLT.
In terms of the distribution of astrological sources across time, the quantity and variety of available materials significantly increases from the late seventeenth century onwards but there is still a considerable amount of surviving texts and documents from the period covered throughout this dissertation. One may question here why I chose this particular period while the source pool is obviously much deeper and wider for later centuries.

It is indeed not arbitrary to select 1450s and 1550s as the two ends of the chronological scope of this project. The period stretching from the Ottoman conquest of Constantinople in 1453 to the eventual “classicization” of the imperial bureaucratic organization and the emergence of a distinctive “Ottoman” culture by the 1550s was the crucial formative stage for the structuring of the empire in the spheres of political, ideological, cultural, and intellectual life. This process, however, was not a linear one. On the contrary, it was marked by a “multiplicity of competing or contradictory cultural and social ideals and assumptions” that were constantly shaped and reshaped by the pressing political and religious dynamics of the time.\(^2\)

\(^2\) Meḥmed the Conqueror’s (r. 1444-46, 1451-1481) attempts to fashion an imperial identity and culture upon the conquest of Constantinople, the fierce succession struggle between his sons Cem (d. 1495) and Bāyezīd II (r. 1481–1512), the alarming — in the eyes of contemporary Ottoman ruling elites — rise of the Safavids as the ultimate political embodiment of the widespread messianic currents, the sudden territorial expansion during the reign of Selīm I (r. 1512-1520) toward the traditionally Islamic territories, and the grand religio-political ambitions of Süleymān to establish

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\(^2\) What Cornell Fleischer has proposed for describing the vibrancy and significance of the first three decades of Süleymān’s reign can in fact be easily extended into this century-long period starting from the Ottoman conquest of Constantinople. See: Cornell H. Fleischer, “The Lawgiver as Messiah: The Making of the Imperial Image in the Reign of Suleyman,” in Soliman le magnifique et son temps, ed. Gilles Veinstein (Paris: La Documentation Française, 1992), 159-177.
universal rule, particularly identifiable during the first half of his reign, all brought novel issues and problems, leaving their traces upon contemporary history writing, epistolographic documents, legal texts, hagiographical accounts, literary works, and an array of astrological and prognostic materials.23

This period also coincided with the growing encroachment, especially in the Eastern Islamic domains, of messianic discourse into the political, intellectual, and religious life that was often validated by the principles of occult sciences, particularly the science of the letters. Concerning the role of this ideological trend in Timurid, Ottoman, Safavid, and Mughal political and cultural contexts, the last decade has witnessed the publication of several important studies.24

In this growing literature, this period is sometimes even defined as the “Messianic Age” that

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23 For the impact upon history writing, see: Kaya Şahin, Empire and Power in the Reign of Süleyman: Narrating the Sixteenth-Century Ottoman World (New York: Cambridge University Press, 2013); for legal writings, see: Snjezana Buzov, “The Lawgiver and His Lawmakers: The Role of Legal Discourse in the Change of the Ottoman Imperial Culture.” (Ph.D. Dissertation, University of Chicago, 2005).

hosts messiahs and mystics, and “comprehends in its various iterations everything from metaphysics, cosmogony to numerology, astrology and magic.”

It is true that Islamic history is replete with periods of millenarian activity and heightened apocalyptic expectations. However, the fifteenth- and early-sixteenth-century chapters of this history are quite unprecedented, because this transitional era that follows the devolution of the Abbasid and Chingizid models of rule and preluding the consolidation of the “territorial” Muslim empires of the Ottomans, Safavids, and Mughals provided a suitable political and cultural environment for the messianic movements to gain a stronger foothold. Moreover, the turn of the tenth century Hijra by 900 (1494/1495 in Common Era) might have also intensified the expectations about the imminence of the end of the first Islamic millennium, and thus the end times.

Despite the current promising status of the studies on the impact of messianic claims couched in occult scientific discourse, modern scholars may rush either to stretch their claims without necessarily drawing upon substantial empirical evidence, or to put everything in the same basket without paying required attention to important epistemological nuances between different (occult) “scientific” practices. Azfar Moin, for instance, says at the beginning of his study that this was a period in which “future was as important as the past, divination as important as genealogy, and astrology as valuable as history.”

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27 For the importance of the fifteenth century in term of polical experimentation and ideological innovation, see: John E. Woods, *The Aqquyunlu: Clan, Confederation, Empire*, revised and expanded edition (Salt Lake City: The University of Utah Press, 1999), 1-10.

points out the urgency of taking astrological sources seriously, the author does not examine in his own study the extant Safavid and Mughal astrological sources, and relies almost exclusively upon contemporary chronicles, literary writings, and visual materials where one can relatively easily find astral/cosmological references.

I do not intend to undermine here the importance of non-astrological texts to appraise the popular dissemination and political adaptation of astrological theories and metaphors. Quite the contrary, these non-technical texts are crucial to measure the extent of the permeation of astrological theories into more popular variants of the writing culture. For instance, in his Risālat al-hudā, Muḥammad Nūrbakhsh (d. 1464) deployed the views of Ptolemy and Naṣīr al-Dīn Ṭūsī (d. 1274) to bolster his claim of the Mahdi status.29 The ceremonies at the court of Mughal emperor Humāyūn (r. 1530-1540; 1555-1556) were organized based on astrological/cosmological principles.30 Many rulers in the post-Timurid era including some of the Ottoman sultans were touted, on the basis of astrological principles, as the šāhīb-qirān (lord of

the auspicious conjunction) and Mahdī of end times. The narratives of the dreams of sovereignty circulating at the time in both oral and written forms were full of astral imagery, such as Fażlullāḥ Astarābādī’s (d. ca 1394) famous dream of the seven stars or the well-known dream of ʿOṣmān Ghāzī, the eponymous founder of the Ottomans, who saw the full moon rising from the bosom of his shaykh and inclining towards his own.

Notwithstanding these valuable non-technical sources into which astrological concepts and discussions easily penetrated, it is my contention that without exerting an equal effort to examine the surviving astrological and other prognostic materials, such claims about the so-called “the science of the millennium,” which, according to Moin, encouraged individuals to speculate “astrological” (and other “rational”) techniques to predict cosmic changes remain hyperbolic. We should therefore endeavor to prove whether the astrological materials produced and/or circulated at the time were really informed by, and did further promote, these broader messianic and millenarian currents.

This was in fact the initial question that had inspired me to explore fifteenth and sixteenth-century Ottoman astrological materials. I began to explore these texts with a view

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toward examining their function vis-à-vis the contemporary millenarian and messianic debates. Having completed extensive research on surviving astrological materials and documents kept in several manuscript libraries and archival sites in Turkey and Europe, I reached the decisive conclusion that the Ottoman astrological sources I examined rarely echo millenarian expectations and messianic claims. There are, of course, occasional remarks from astral experts, eulogizing the reigning Ottoman sultans as the messianic savior (*Mahdī*) of the time and the *šāhib-qirān* of the age, but except for very rare cases, these sycophantic remarks are not accompanied by detailed justifications of the astrological reasoning. What is channeled through these astrological materials, especially through the annual almanac-prognostications (*taqwīm*), is rather an overwhelming sense of order designed by Divine power and orchestrated by the reigning sovereign.

Despite the fact that available Ottoman astrological materials fall short of revealing millenarian and messianic debates, these sources are still invaluable for providing colorful insights into the political, cultural, and intellectual/scientific realities of the time. In fact, the possibility of weaving together such diverse historiographical coordinates is the most inspiring and promising aspect of studying these hitherto neglected astrological materials and visiting the hitherto marginalized lives of these astral experts (*munajjims*).

**Sources and Their Problems**

The sources perused throughout this dissertation can be grouped into two main categories: astrological and non-astrological sources. The astrological corpus includes *taqwīms* (annual almanac-prognostications), extant horoscopes in the form of manuscripts or archival
memos and reports produced for the occasions of the birth of a sultan, construction of an imperial complex, or commencement of a military campaign, and other relevant texts through which astrologically valid information was conveyed. This last group specifically includes astrological textbooks, the zīj literature, and treatises on astronomical instruments utilized by munajjims to equip themselves with the necessary skills and knowledge for practicing astrology.

The overwhelming majority of these astrological texts remain in manuscript form and some of them have not even been properly catalogued. In view of the heavy reliance of this study on unpublished manuscript sources, I should say that there is an immediate need for scholarly editions of several works cited throughout this dissertation. My project is in fact only a modest attempt to provide for future studies a useful inventory of available materials and a number of working assumptions regarding the possibilities these texts present modern historians.

Among these extant materials, taqwīms stand as the genre par excellence for the production and presentation of learned astrological knowledge. To a modern reader, a taqwīm may sound nothing different than a calendar, but one should resist understanding medieval and early modern taqwīms as such. They are rather almanacs produced on a yearly basis to systematically combine astronomical, astrological, and calendric information. The detailed examination and discussion of the textual components of the taqwīms will be provided in the fourth chapter but it should be noted from the outset that these texts were routinely produced by astral experts, around the time of the solar year-transfer, that is, the Spring Equinox and the beginning of the new solar year in early March. The almanac-maker (usually but not necessarily a munajjim) calculates, first, the degree of the ascendant (ṭāliʿ/horoscopus) at the particular
moment Sun completes its yearly rotation and enters the sign Aries.\textsuperscript{34} Counting on this degree, he determines other astrological variables and starts interpreting the fortunes of people from different social categories and of earthly affairs. These detailed predictions were followed by the laborious tabulation of astronomical, astrological, and calendric information for each solar month of the upcoming year. He would then place ephemeris tables to demonstrate the daily celestial positions, to mark the corresponding days in different chronology systems used at the time, and to write down astrological remarks for the overall fortunes of each month.

Although the earliest available textual example of an Ottoman \textit{taqwīm} dates back to the time of Mehmed I (r. 1413-1421), it should be noted that \textit{taqwīm} was an older and universal genre regularly practiced in the Medieval Islamic society. In addition to those texts surviving — albeit limited— from the pre-Ottoman Islamic world, there are numerous references to the phenomenon from at least tenth century onwards. Yet the surviving Ottoman corpus outweighs all other sets of extant \textit{taqwīms} from different Islamic societies, and thus coalesces a substantial body of material that enables us to systematically examine its structural development and functioning from the late fifteenth century on.\textsuperscript{35}

The existence of this rich corpus of source material is not completely unknown to modern scholars. In the 1950s and 60s, Osman Turan and Nihal Atsız published certain sections, particularly the historical chronology tables of some of the mid-fifteenth century Ottoman \textit{taqwīms}. As prominent Turkish scholars of the positivist-nationalist historiography, they were of the opinion that these \textit{taqwīms} were full of astrological credulity, thus had no historical value

\textsuperscript{34} The ascendant (\textit{jāli}) is the point of the ecliptic rising on the eastern horizon at the given moment. See: David King and Toufic Fahd, “al-Ṭāliʿ,” \textit{EI}, Online version.

\textsuperscript{35} See Appendix C for the complete list.
except for the parts devoted to the narration of universal history. That was the justification they used when explaining why they published only the sections on chronology and ignored the remaining portions, which usually constituted more than 95% of these accounts.

The selective publication of the chronology sections of earlier taqwīms had two negative consequences in the scholarship. First, by giving the impression that taqwīms were produced only to provide chronological and calendrical information, these studies allowed for the rich astrological components of these texts to go unnoticed. Secondly and more importantly, they left a false and ahistorical impression that these standard chronology tables were incorporated into all extant taqwīms. However, the systematic investigation of taqwīms from the fifteenth to the seventeenth centuries clearly reveals that these chronological lists, and several other sub-sections once frequently used in earlier taqwīms, ceased to exist identifiably from the 1500s onwards. This change in the structure of the taqwīms, which was also accompanied by other sorts of variation in the language, size, and even mise-en-page, provides a unique opportunity to historicize these documents and discuss the wider cultural and ideological issues of the time that had repercussions upon the changing tastes and dynamics of taqwīm writing.

In addition to tracing the changes in the structural elements of the taqwīms, tracking the deviations in the contents, expressions, and even the tone of detailed astrological predictions also helps us historicize these documents. It is true that as a general rule these predictions are couched in very generic narrative elements with the heavy use of impersonal pronouns, platitudes, and

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repetitive remarks. Therefore it is difficult, and precarious indeed, to haphazardly attribute each and every prediction to an actual historical occasion. What I would like to offer as a sound methodology to deal with the problems caused by repetitive remarks and boilerplate narrative progression is to treat taqwīms as a cluster of texts and read them in juxtaposition with one another. Comparisons made between the taqwīms written by a single author across time, or between the taqwīms written for a single year by different authors can help us identify more accurately the deviating elements in these predictions. Another comparative method that can provide us even more precise answers about the real value and public recognition of the astrological predictions is reading them in parallel with contemporary historical narratives to detect whether the prognostications expressed in almanacs really influenced contemporary discourse or even manipulated certain political and imperial decisions. As will be detailed in Chapter 4, the Ottoman ruling elites took these astrological predictions seriously to the extent that the remarks of the munajjims on taqwīms could call off a campaign or determine the timing of an open battle.

*Taqwīms* are also crucial for illustrating the scientific horizons of astral experts, as they reveal which specific astronomical tables and/or astrological sources were consulted by the munajjims for undertaking astrological calculations. Unfortunately, many of the surviving taqwīms from the period bear no autograph; therefore it is not always possible to determine their authors. Moreover, relatively better-known munajjims during the time in question left too little autobiographical information that would have otherwise made it possible to fully reconstruct their scientific inspirations. Yet, through a systematic examination of references in often-anonymous taqwīms and other horoscopes as well as such circumstantial sources as book
inventories from the period, one can clearly delineate the preferences of Ottoman astral experts and how they changed over time. This kind of knowledge is extremely valuable from the perspective of the history of science and social history of knowledge, which I will specifically visit in chapters 2 and 3 as part of my general discussion on munajjims’ vocational training and the impact of the post-thirteenth century Persian astral tradition on the formation of the Ottoman canon.

Last but not least, taqwīms allow for an investigation of how munajjims thought about their own craft. In the introductory passages preceding the astrological prognostications, munajjims often delved into a brief discussion on the epistemological limits of astrology. These authentic remarks will complement my discussion in the first chapter on the true place and epistemological status of astrological science in the late-medieval and early-modern Islamicate context.

Aside from almanac-prognostications, there are a few horoscopes from the period in question that were produced for such occasions as the birth of the sultan, the construction of an imperial building, or the start of a military campaign. Unfortunately, despite frequent references in contemporary sources to the prevalence of the practice, very few horoscopes have survived. This raises the question of whether the horoscopes produced for such specific occasions were deliberately destroyed upon their presentation in an effort to maintain a certain level of secrecy. The question is not entirely groundless; traces of such concern for secrecy can in fact be found among some extant Ottoman archival documents, which survived contra their authors’ explicit requests for their destruction. For example on one such occasion, Ḥaydar the geomancer reiterates à la Mission Impossible that the geomantic report he is sending to Süleyman to
confidentially inform the sultan of the potential calamitous activities of the Prince Bāyeẓīd (d. 1561) in cooperation with the Safavid ruler Shāh Tahmāsb (r. 1524-1576) should be destroyed or at least concealed immediately after reading.37

Yet it is difficult to argue that these privacy concerns hold true for all types of astrological production, some of which were not immediately confidential and significant. As for the problem of documentation one should also take into consideration the oral nature of astrological counseling. There are numerous examples of court munajjims, who were in close proximity to the rulers and other patrons, conveying their astrological interpretations verbally. Apart from certain implications in the Ottoman historical narratives as regards to the verbal character of astrological communications, the European historiography has unequivocally documented that astrological predictions were often expressed verbally, lest the written explanations fall in the hands of dangerous rival parties.38

Regarding the discussion on the relative scarcity of extant horoscopes and other confidential astrological reports from the period in question, it should also be noted that since early 2010s there has been an ongoing cataloging project at the Topkapı Palace Museum Archive to identify, classify, and digitize all the available loose documents (evrâk). When I was conducting my research in Istanbul in 2014-2015, only a few volumes of catalogs were mare ready that contained information on mostly eighteenth century documents. At the time I was

37 TSMA E. 1698: “saʿādetī sultanumuñ mürüvvetinûn așârînenden soyle ricâ iderîm ki riţâ-yî haḳḳ icîn bu garîb-i bi-kес ve bi-hâminûn aḥkâm rmîllêrim bi rî kimesneye göstermeyüb muṭṭâla a kîldûkda nîhân ve maḥv idesiz ki rî kimesne aḥîvâle muṭṭalle olmay.”

38 Monica Azzolini, The Duke and the Stars. 4. Hillary Carey also points to the fact that most of the horoscopes are written without textual appendix and only as diagrams, hinting that they were probably expressed on the spot. See Hillary M. Carey, “Astrology at the English Court in the Later Middle Ages,” in Astrology, Science, and Society: Historical Essays, ed. Patrick Curry (Woolbridge: Boydell Press, 1987), 41-56.
conducting my research in Istanbul, the Topkapı Palace archive was not even open to researchers, but the directors, who knew my research interests, kindly shared with me a few interesting documents that they had recently chanced upon during their ongoing cataloging work. These documents include a couple of petitions written by anonymous munajjims at the time of Bāyezīd II, which I will occasionally refer to throughout the dissertation. The presence of these hitherto unknown documents is highly encouraging; it is an indication that the current scarcity of evidence about secret astrological and/or other prognosticative correspondences can be slightly rehabilitated in the near future when the information on all the available documents in the Palace archives is finally established with full precision.

In addition to taqwīms and extant horoscopes, I will also occasionally refer to the major examples of the post-thirteenth century Persian zīj literature, several treatises on astronomical instruments, and manuals imparting fundamental astrological teachings, all of which provide important details about both the real epistemological status of astrology in the period in question and the social history of the Ottoman munajjims’ training. The zīj literature is particularly useful and its candidness in revealing the astrological implications of celestial knowledge produced through the systematic study of the heavens will greatly help to understand the necessary scientific context in which taqwīms functioned. The zījes that will be particularly mentioned throughout the dissertation include: i) the Ilkhanid tables (Zīj-i Īkhānī) produced in the mid-thirteenth century by Naṣīr al-Dīn Ṭūsī and his collaborators as part of the brief observational enterprise at the Maragha observatory; ii) several commentaries and later editions of the Ilkhanid tables including the works of ʿAlī-Shāh Būkhārī (d. later than 1291), Shams al-Dīn Wābkanawī (d. 1320), Niẓām al-Dīn Nīšābūrī (d. 1328/9), or Jamshīd al-Kāshī (d. 1429); iii) Ulugh Beg
tables (Zīj-i Ulugh Beg or Zīj-i Jadīd-i Sulṭānī) compiled in the mid-fifteenth century as the result of the systematic observation program at the Samarqand observatory, and iv) relatively minor attempts in both the Iranian and Ottoman world such as the zīj of Rukn al-Dīn Āmulī (d. later than 1455) or that of Mevlānā Kūçek (d. later than 1478).

While taqwīms, horoscopes, and other technical texts funneling astrologically valid knowledge constitute the first group of sources that I define as “astrological materials”, the second group consists of non-astrological materials, including: i) archival registers of palace expenses where useful information about the salaries and professional status of court munajjims can be found; ii) contemporary chronicles, historical narratives, and biographical dictionaries that provide anecdotal evidence about the social and personal dynamics of astrological practice; and iii) books on the classification of sciences and select examples of the kalām literature in which a thorough discussion on the epistemological status of astrological knowledge can be found.

The Ottoman experience of astrological practice is unique in the sense that unlike other parts and periods of Islamic history where the existence of munajjims could only be reconstructed through unreliable anecdotal evidence the courtly presence and service of munajjims is documented in the Ottoman case on the basis of hard, archival evidence. This evidence is gleaned primarily from the registers of palace payments and budgets, some of which were already published thanks to the scholarly efforts of Ömer Lütfi Barkan and Halil Sahillioğlu. The earliest of such registers of payment that furnished information about a munajjim dates back to 1478, listing only one munajjim under the rubric of the loosely defined
müteferrika status.\(^{39}\) From the crucial period of Bâyêzîd II’s reign — crucial in the sense of cultivating astrological knowledge and institutionalizing the patronage of the munajjims — we have a large register of gifts and payments recording the names of all individuals who received cash and/or other kinds of gift on various occasions. This register is generous enough for our purposes as it clearly documents the names of court munajjims and other astral experts presenting the court with the taqwîms. The same register also alludes to the status of their professional careers — whether listed under the müşâherehorân [monthly salaried officials] status or not — and makes evident the amount they received.\(^{40}\)

The use of these archival records is twofold. First, it is possible to create a prosopographical list of those munajjims tied to the Ottoman court during the period in question. Unfortunately, these archival records do not allow modern researchers to delve into the personal lives of the astral experts as they only provide information, if we are lucky, on their names, status, and salaries and/or gifts received. This information is still invaluable though; because one can combine this archival evidence with the information gleaned from manuscript sources to closely track the careers of, at least, certain munajjims. The second and more important use of


\(^{40}\) For the müşâherehorân see, Linda Darling, “Ottoman Salary Registers as a Source for Economic and Social History,” *Turkish Studies Association Bulletin* 14/1 (1990), 13-33. The accounts for the years 909 and 910 are already published. Ömer Lütfi Barkan, “İstanbul Saraylarına Ait Muhasebe Defterleri,” *Belgeler* IX/13 (1979), 1-380; Mustafa Açıkgöz, “II. Bayezid Devri İnamat Defteri (Muharrem-Zilhicce 910/Haziran-Mayis 1504-1505)” (MA Thesis, Marmara University, 1995). Based upon this register İsmail Erünsal brought together all the poets and authors that received gifts upon presenting to the palace their most recent literary works. See: İsmail E. Erünsal, “Türk Edebiyatının Arşiv Kaynakları I: II. Bayezid Devrine Ait bir İnamat Defteri,” *İÜEF Tarih Enstitüsü Dergisi* 10-11 (1981), 303-347.
the archival evidence is that these documents scattered across different periods lucidly portray how the “office” of the court munajjims constantly underwent changes from the late-fifteenth through the mid-sixteenth century in terms of the number of personnel and the amount of their salaries. This provides substantial insights into the dynamics of patronage at the courts of different Ottoman sultans, a question I will particularly tackle in the third chapter.

Aside from the archival documents, I will occasionally have recourse to contemporary chronicles, biographical dictionaries, and other narrative sources to reconstruct the personal dynamics of astrological practice. Quite surprisingly, Ottoman narrative sources from the period in question provide very little anecdotal information concerning the lives of munajjims. First of all, there is no such source in the early-modern Ottoman literary culture that one may compare to the Faraj al-mahmūm of Ibn Ṭawūs (d. 1266), a thirteenth-century biographical dictionary written specifically on the lives of munajjims, or the Chahār maqāla of Niẓāmī-i Arūḏī (d. later than 1156), who dedicates one of his four chapters to anecdotes solely about practicing munajjims.⁴¹ Although one can find frequent references, in the late-fifteenth and sixteenth-century Ottoman chronicles and historical narratives, to the munajjims’ calculation of astrologically auspicious moments, these brief remarks do not reveal the identity of these astral experts or imply any court intrigue they partook. Famous examples of the sixteenth-century

Ottoman biographical dictionaries of scholars or poets such as Ṭaşköprîzade’s (d. 1561) al-Shaqa’iql al-nu‘mâniyya fî ‘ulamâ’ al-dawla al-‘uthmâniyya, ’Āşîk Çelebi’s (d. 1572) Meşâ’irû’s-şu’arâ’, or Laṭîfî’s (d. 1582) Tezkiretü’s-şu’arâ also furnish scant information on the lives of munajjims or other names involved in astral activity. While the tezkires of poets often provide more personal details, these collections by nature contain information only about those individuals that have composed poetry. Thus, except one or two cases, it is difficult to find in these sources useful information to reconstruct the lives and careers of the court munajjims.

Finally, for the discussion on the epistemological status of astrology in the eyes of contemporary learned individuals, which I will undertake especially in the first chapter, I will delve into numerous examples of the taşnîf al-‘ulûm (classification of the sciences) genre and a few select kalâm texts produced in the late-medieval Turko-Persian intellectual context. The dominant narrative in the current scholarship resorts to a rather thick definition of astrology and tends to describe it as an unsophisticated occult craft and/or a folk practice of magic without necessarily taking into consideration the complex cosmological, astronomical, and mathematical underpinnings of learned astrological pursuits. There is in fact a rich literature on how astrologers were attacked and condemned —mostly by theologians and jurists— in medieval Islamic society. Despite the fact that these studies focusing upon the views of Ibn Sînâ (d. 1037), Ghazâlî, Ibn Taymiyya (d. 1328), Ibn Qayyim al-Jawziyya (d. 1350), or Ibn Khaldûn (d. 1406) have contributed to our understanding of the arguments directed against the practice of astrology in the Islamicate world, they nevertheless fail to differentiate the vehement attacks toward astrologers, who were often charged with the alleged belief in astral determinism, from the more neutral, if not always tolerant, assessment of astrological/cosmological principles. The
perspective brought by some of the Ottoman sources including Ṭaškoprızâde’s encyclopedic work, Miftâh as-sa‘āda wa miṣbâh as-siyâda, or Mû’eyyedzâde’s (d. 1516) kalâm text, al-Ḥawâshi ʿalâ Sharḥ al-Mawāqif challenges this dominant narrative, which facilely assumes that traditional scholars categorically dismissed astrology as a valid and religiously licit branch of knowledge.

**Theses Proposed in the Dissertation**

I should underline at the very outset that this dissertation strives not for writing the history of astrology in the Ottoman realm, but rather for exploring the astrological knowledge produced and circulated in the Ottoman realm to scrutinize its broader cultural, intellectual, political, and social implications. Therefore, although I will have to refer, every now and then, to the complex methods and techniques appealed by the munajjims for practicing their own craft, I have no intention of testing the veracity of their planetary calculations and/or astrological interpretations on the basis of modern astral knowledge. This kind of endeavor would have certainly been useful from a mere history of science perspective, yet my own academic formation does not allow me to undertake such a demanding business.

In the light of my preoccupation in the past few years with the Ottoman astrological lore, I will advance a number of theses, instead of a single grand claim, that touch upon different historiographical coordinates in Ottoman as well as Islamic studies.

I. The Ottoman astrological materials, which have long been neglected by both conventional Ottoman historians and historians of scientific enterprises in past Islamic societies, provide important insights into the intersecting layers of science, politics, and
culture in the late-medieval and early-modern Islamicate and/or Ottoman context. This is the richest astrological corpus surviving from any part or period of Islamic history. Unlike astrological textbooks of earlier periods in Islamic history that were produced primarily to instruct the universally applicable rules of the astrological craft, the extant Ottoman astrological texts such as the complete set of almanac-prognostications and a few scattered occasional horoscopes are the applied forms of astrological knowledge into concrete occasions. Hence they are inherently sensitive to their immediate historical, political, and cultural realities. The systematic examination of their contents enables one to closely track the scientific inspirations, cultural orientations, and socio-political contentions, which were subject to change over time.

II. The epistemological status of astrology in the pre-modern Islamicate context was much more complex than assumed by modern historians of science. The widely accepted model in the current historiography of science that asserts a strict separation between ‘ilm al-hay’a (lit. science of the configuration of the entire universe), ‘ilm al-nujūm (lit. science of the stars), and ‘ilm aḥkām al-nujūm (lit. science of the judgments of the stars) on the basis of earlier Arabic sources fails to notice the complex dynamics of the astral production in the post-thirteenth century Turko-Iranian context. While many astral experts from the period were definitely aware of the nuances between the astronomical investigation of the heavens (i.e. hay’a and nujūm) and astrological interpretations of the celestial knowledge (i.e. aḥkām), they still recognized the strong dependence of astrology on the detailed knowledge of mathematical and astronomical state of the heavens.
III. The heightened interest in the post-thirteenth century Persianate East in establishing observatories, conducting systematic observational enterprises, and updating the available data on the motions of planets was intimately related to the need for more precise astronomical information to undertake more accurate astrological practice. While the current state of the field is not mature enough to make bigger claims, it seems plausible to argue, on the basis of promising evidence in the zij literature, that not unlike in the early modern Europe, the urge to practice a mathematically precise and scientifically valid astrology was closely linked to the contemporary renaissance of mathematics and astronomical instrumentation in the eastern Islamic lands.

IV. The late-fifteenth and early-sixteenth century Ottoman context is a perfect laboratory to trace the impact of the Persian astral tradition upon the formation of the Ottoman astral corpus and professional cadres under the aegis of the court. The curious stories of astral experts as well as the scientific manuscripts and instruments, moving from the diyar-ı ʿAcem into the diyar-ı Rûm, stand as one of the most illuminating chapters of the history of scholarly mobility and circulation of knowledge in the late-medieval and early modern Islamicate world.

V. The practice of learned astrology required the courtly patronage. For the cultivation of astral sciences in the Ottoman context, credits should go to Bâyezîd II, whose significance in the cultural and political transformation of the Ottoman polity has largely
escaped the attention of modern historians. Bāyezīd II’s genuine learned interests in personally studying the astral sciences and patronizing an unprecedented number of astral experts facilitated the formation of the Ottoman astral canon and institutionalization of the office of the court munajjims, which would function as the prime mechanism of would-be munajjims’ vocational training and professional service.

VI. Modern scholarship presumes a vague definition of astrology and regards such diverse practices of celestial magic, talisman making, or mystical/numerological interpretation of celestial phenomena as its inextricable constituents. While these practices of “magic” essentially require the knowledge about the qualities and characteristics of the celestial objects, to equate the learned practice of astrology—which was rather an applied science for predictive purposes— with magic would not always do justice to the actual contents and discussions in the Ottoman astrological materials explored in this dissertation.

VII. The details from the lives of Ottoman astral experts (munajjims) clearly portray the learned character of the astrological craft. Although majority of the modern scholarship imagines munajjims as back-street charlatans or magicians promoting the idea of astral determinism, the real agents were well trained in the diverse branches of mathematical, natural, and traditional sciences. Moreover, the great majority of the trained munajjims was aware of the epistemological problems inherent in the art of astrology and often expressed in their writings the limits of this science. Some of these experts even relinquished their craft due to spiritual anxieties, wishing to steer clear of challenging
God’s omniscience and omnipotence.

VIII. Besides the fact that overwhelming majority of the munajjims serving the Ottoman court was self-critical about the epistemological limits of their craft, several madrasa-educated scholars and ʿālims had a somewhat lenient attitude towards the practice of astrology as long as certain fundamental principles of Islamic belief were preserved. Some of these scholars, like Mū‘eyyedzāde (d. 1516), were even keenly interested in studying and practicing the science itself. The strict objections raised against the practice of astrology by the earlier Hanbali jurists such as Ibn Taymiyya or Ibn Qayyim al-Jawziyya did not take hold among the Ottoman scholars. Quite the contrary, these names were sometimes explicitly criticized for their redundant counter arguments.

IX. Intriguingly, the most severe objections against the practice of astrology came from eminent Sufis who vilified astrologers on account of their claims and methods, though they did not necessarily reject the fundamental cosmological principles underlying the practice of astrology. This brings the immediate need to appreciate the nuances inherent in the polemical literature, which often heavily criticizes astrologers without necessarily denouncing some of the scientific principles upon which astrological practice relied.
Chapter One—The Most Mathematical of all Occult, the Most Occult of all Mathematical Sciences: The Epistemological Status of Astrology in the Medieval Islamicate Intellectual Context

I. 1. Introduction

It is a truism that astrology is no longer considered legitimate scientific knowledge. When we think about astrology today, negative images flood the mind, from the clichéd daily horoscopes published in newspapers or accessed through mobile apps to backstreet charlatans and psychic shops scattered around metropolitan neighborhoods. With the exception of a few private academies and certificate courses for the teaching of astrological techniques, the discipline has long fallen from its esteemed position in medieval and early modern academic circles.¹

We should not overstate, however, the epistemological prestige once attained by astrology in the ancient, medieval, and early-modern world. Notwithstanding the fact that there were many scholars and learned individuals who regarded it as a serious and valid science, astrology never entirely escaped the critique of staunch opponents. A wide array of literate people in different times and places espoused the invalidity or the limits of the efficacy of this

science, coalescing into a rich polemical literature that functioned as a vibrant arena of debate.² The medieval and early-modern Islamic intellectual landscape certainly did not want for these sorts of disputations.³

Despite the fact that the anti-astrology camp seems to have dominated the classical and post-classical Islamic intellectual realm, featuring a constellation of stellar names from diverse fields of knowledge, including al-Fārābī (d. 950), Ibn Sīnā (d. 1037), Ibn Taymiyya (d. 1328), and Ibn Khaldūn (d. 1406), the firmament of proponents was studded with luminaries like Fakhr al-Dīn Rāzī (d. 1209) and the Ikhwān al-Ṣafāʾ (ca. tenth century). From a historian’s point of view, it is of utmost importance, as Richard Lemay has aptly remarked, to take each case separately and treat the particular historical and personal contexts for that specific individual’s acceptance or rejection of astrology.⁴ Yet it is also useful to assemble together the standard arguments deployed by different parties in order to establish certain patterns in the argumentation and easily trace the diverging elements for a more accurate historical analysis.

What is more important, and particularly lacking in the literature on the epistemological status of astrology in medieval Islamic thought is to explore how the practitioners themselves

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³ While this question will be examined in detail below, useful summaries of the relevant debate in the medieval Islamicate intellectual context can be found in Manfred Ullmann, Die Natur- und Geheimwissenschaften im Islam (Leiden: Brill, 1972), esp. 271-277; George Saliba, “Astronomy and Astrology in Medieval Arabic Thought,” Les Doctrines de la Science de l’Antiquité à l’Âge Classique, ed. Roshdi Rashed et Joël Biard (Leuven: Éditions Peeters, 1999), 131-164.
defined and approached their own craft. The relevant discussions in current historiography have been dominated by an externalist perspective that gives precedence to the views of non-astrologers instead of authentic practitioners. 5 Needless to say, the ways in which munajjims discussed and practiced their craft are crucial: they provide strong insights into how astrology was actually defined and perceived as a science at the time by its own executors.

This chapter primarily aims at discussing the contentious character of astrology in the medieval Islamic intellectual landscape, which resonates well with the relevant discussion in the fifteenth- and sixteenth-century Ottoman milieu. The debate on the real value and true place of astrology was indeed complicated, and it would not do justice to the wide array of sources at hand that often conflict with one another if we strictly insist on a single narrative out of many potential explanations.

The complicated nature of astrology in the medieval Islamic intellectual context stemmed mainly from its epistemological status, as it was:

i) Considered among the sciences of the ancients (ʿulūm al-awāʾil), which traditional scholars (ʿulamāʾ) often took with a grain of salt6,

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ii) Dependent upon the unwavering mathematical knowledge of the heavens but applied to understand the ever-changing physical nature of the sub-lunar world,

iii) Susceptible to interpretation as an activity that would undermine the belief in God’s omnipotence.

Besides these restraints caused by the entangled epistemological structure of astrology (which I will explain in further detail below), there were other complications derived from the checkered and at times conflicting approaches toward the practice. It is true that numerous ʿālims and devout Muslims denounced astrology on religious grounds but it is also true that there were many traditional scholars who saw no problem with practicing astrology as long as certain boundaries with respect to the Islamic dogma of tawḥīd were preserved. Moreover, there were certain munajjims who were highly skeptical about the premises of astrological science, whereas several other experts considered astrology the noblest of all disciplines. In view of all these complications, the discussion on the real epistemological status and validity of astrology is replete with conflicts and contradictions even within the oeuvre of a single author.

In order to grapple with such complications, my analysis will proceed in the light of three different, yet interrelated, sets of questions: i) What did the practice of astrology really correspond to as a science in the eyes of its practitioners and external interpreters? ii) Where was it situated in the “taxonomy of science” (taṣnīf al-ʿulūm) tradition and to what extent were Ottoman interpretations different from established conventions? iii) Which particular groups were more skeptical about the practice and what were their major lines of argument?
I. 2. Astrology and its Branches

The modern semantic and epistemic distinction between astronomy and astrology does not fully capture the disciplinary boundaries existed in the pre-modern world. This is no surprise for a student of the history of science in the ancient or medieval world, because the available literature generally assumes that in both Greek and Latin literature, the strict semantic distinction between *astronomia* and *astrologia* was not fully established until the fourteenth century.\(^7\) Rather, these two concepts were often used interchangeably to denote an all-encompassing category of the “science of the stars.” Even Ptolemy, the leading authority in astral sciences in the late antique and medieval eras, did not employ a strict terminological distinction, though he definitely implied a division on the grounds of the subject matter and objectives of two distinct types of activities: one that investigates the movements of celestial bodies and the planetary aspects, and the other exploring the changes that emerged in the terrestrial realm as a result of the vicissitudes in the configuration of heavenly objects.\(^8\)

This division in terms of the subject matter is best manifested through Ptolemy’s two separate books, each covering one of the two divisions. His *Almagest* treats the subjects that we can simply define as “astronomical”, his *Tetrabiblos* matters “astrological.” It is also worth noting that the term Ptolemy used to define the science we now categorize as astrology was

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“prognostication through *astronomy*” (ἀστρονομίας προγνωστικόν). For Ptolemy, the premises of the second category of the science of the stars are by nature weak and unpredictable, whereas the one examining the physical qualities and movements of celestial objects is an unvarying, self-sufficient science.

In the medieval Islamic intellectual framework, where the adoption and adaptation of pre-Islamic scientific traditions of the Hellenistic, Sassanian, Indian, and Mesopotamian world were accompanied by the consolidation of the realities inherent to Islamic society, this semantic distinction in approaches to celestial knowledge became further obscured. According to George Saliba, as early as the second century of the Hijra, the weak semantic distinction in the Greek and Latin tradition was replaced in Arabic scientific lore by a new category, “*ilm al-hay’a*” (the science of the configurations [of the stars]) that would gradually transform into the science of the structure of the entire Universe. For Saliba, this term was coined by the experts of celestial knowledge in early Islamic society, who tried to detach themselves, and their own intellectual spheres, from the pursuits of astrologers. Saliba argues that this new semantic category had no exact equivalent in pre-Islamic civilizations and that it grew out of cultural-religious dynamics intrinsic to the Islamic civilization, to wit, the tensions between the religiously-minded elites and the advocates of “foreign sciences” (*ʿulūm al-awāʿil*). For Saliba, the introduction and subsequent appropriation of *ʿilm al-hay’a* ushered in an increasing use of the term “*ʿilm [or

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9 Ibid., xi.
ṣināʿat] ahkām al-nujūm” (“the science [or the art] of the decrees of the stars”), which was to label strictly astrological activities. Hence, ‘ilm al-nujūm, the once-overarching category of the science of the stars that corresponds to the astronomia or astrologia of the earlier Greek and Latin traditions, gradually disappeared.

Notwithstanding the significance of Saliba’s emphasis upon the emergence of a novel semantic category, his explanatory model has several pitfalls. First of all, the distinction between ‘ilm al-hay’a and ‘ilm/ṣināʿat ahkām al-nujūm that Saliba clearly detects in the classical Arabic sources was not strictly drawn in the post-classical Persian astral tradition. As will be demonstrated below, especially texts on applied celestial knowledge produced in the post-thirteenth-century Persianate world often promoted the deployment of the category of “the science of the stars” (‘ilm al-nujūm) as an umbrella term betokening practical celestial pursuits, including astrology. Furthermore, Saliba’s rigid distinction on the mere grounds of semantic categories inevitably leads one to fail to notice the fluidity of activities the astral experts actually undertook. As already evident from Ptolemy’s obvious implication in his introduction to the Tetrabiblos, practitioners were already aware of the inherent nuances between “astronomical” (read scientific or computational) and “astrological” (read prognosticative or interpretive) facets of studying the heavens, even though they did not always use separate terms to refer to these activities. One thing that is for sure, however, was that the experts were also cognizant of the heavy interdependence of mathematical/astronomical and astrological knowledge. What Saliba sees as a crystal-clear distinction between “hay’ā”, “nujūm”, and “ahkām” was indeed considered by many astral experts as inextricable and complementary spheres of the unified body of celestial knowledge. The concept that ahkām is a natural sequel to nujūm and hay’ā was, as
Nallino rightfully asserts, “common to all the Muslim munajjims and is accepted also by some philosophers.”\textsuperscript{12} In that regard, munajjims acknowledged and often made explicit that, without the working knowledge on the forms and physical structures/qualities (i.e. hay’a) of the celestial objects, it is impossible to make the necessary calculations as to the motions and positions of the heavenly bodies, and that without the knowledge gleaned from mathematical operations about the motions and positions of the stars (\textit{a’māl-i nujūm}), it is not possible to interpret the indications of celestial configurations.

We should, however, note that not all astral experts were eager to practice, or at least write about, different variants and genres of celestial knowledge including astrology. For example even a cursory look at the oeuvre of the luminaries of the Samarqand mathematical-astronomical school such as Qāḍīzāda-i Rūmī (d. later than 1440) or ʿAlī Qūshjī (d. 1474) clearly demonstrates that these names did not produce a single text on \textit{ahkām}, although the \textit{Zīj-i Ulugh Beg}, like many other \textit{zījes}, has specific sections exclusively upon horoscopic astrology.\textsuperscript{13} As we will see further below, some of the Ottoman court munajjims were also distressed for being compelled to practice \textit{ahkām}.

The heavy dependence of \textit{ahkām} upon detailed technical and computational knowledge of hay’a and nujūm is best exemplified in some of the technical treatises produced in the post-thirteenth-century Persianate realm. The significance of this particular milieu can hardly be exaggerated in regards to the cultivation of astral sciences and the production of the authoritative


texts that would decisively shape the scholarly horizons of the *munajjims* active in the early-modern Ottoman world. The period that witnessed the Mongol expansion toward Western Iran and the integration of the eastern and western ends of the Eurasian landscape also saw an increased level of scientific celestial activities. Although the reasons are not entirely clear why there was such an enthusiasm at that time for constructing state-of-the-art observatories and for assembling therein the leading experts of celestial knowledge from diverse regions, increased contacts with Chinese civilization had a definite positive impact upon the cultivation of observational celestial knowledge. Aydın Sayılı also argues that Turko-Mongol domination over Eastern Islamic dominions might have facilitated celestial enterprises, as many of the patron dynasts and scholars in the region were not thoroughly indoctrinated with more austere Islamic traditions and customs that usually frowned upon the practice of astrology.¹⁴

No matter what the exact factors were that facilitated systematic celestial pursuits in the post-thirteenth-century Persianate sphere, the two most important observatories in all of Islamic history were established in the region, namely the Maragha observatory constructed in today’s Azerbaijan in the mid-thirteenth century with the support of the Ilkhanid rulers (particularly that of Hülegü and his son Abaqa Khan), and the Samarqand observatory built on the initiative of Ulugh Beg in the first half of the fifteenth century. Between the construction dates of these two observatories minor observations were also conducted in the region by numerous individual experts including ʿAlī-Shāh Būkhārī, Wābkanawī, or Rukn al-Dīn Āmulī, whose scientific activities will be mentioned further below.

In the post-thirteenth-century Persianate East, heightened interest in systematic

observational programs (raṣad), many of which had to be interrupted due to political turmoil and/or lack of consistent financial support, primarily stemmed from a desire to correct the celestial data (taṣḥīḥ-i jadval) conveyed through astronomical tables (zīj). At the end of each systematic observation program was produced a new zīj with revised figures. The original Zīj-i Ilkhānī, for instance, was composed by Naṣīr al-Dīn Ṭūsī at the Maragha observatory with the aim of rectifying the data of previous zījes, but even after Ṭūsī’s death in 1274, experts, including his son Aṣīl al-Dīn, retained the observations until the turn of the fourteenth century and prepared newer editions of the text with more accurate data.\textsuperscript{15} The program of systematic observation at the Samarqand observatory also aimed to revise the available tables and ultimately yielded the Zīj-i Ulugh Beg, which, as we will see in more detail in the next chapter, eventually became the main reference work of Ottoman munajjims from the early sixteenth century onwards.

Before detailing the significance of the zījes for astrological purposes, it is in order now to briefly summarize what the learned practice of astrology really involved. Despite modern prejudices assuming that astrology is and was always an unsystematic and vulgar practice bereft of mathematical sophistication, scholars and astral experts in the medieval Islamicate world rarely hesitated to speak of the dependence of astrology upon complex mathematical knowledge of the heavenly spheres. For example al-Bīrūnī, who was not sympathetic toward the practice of astrology, still reminds his readers “no one is worthy of the style and title of astrologer (munajjim) who is not thoroughly conversant with geometry (handasa), arithmetic (ʿadad),

\textsuperscript{15} Sayılı, 211-218.
The exact scope of learned astrology can best be illustrated by comparing it to more vulgar and lay versions of astrological practice. While the former essentially requires the tedious task of calculating celestial positions and variables according to the exact time and location of the astrological matter in question, the latter does not involve such mathematical sophistication and astronomical rigor. Instead, lay practitioners of astrology often replaced minute scientific calculations with either folk knowledge on the cyclical patterns of celestial and meteorological occurrences or with esoteric and often simple lettrist/numerological explanations ascribed to heavenly objects. For example one of the most common forms of lay astrology, the malhama literature, intends to divine the fortunes of the year in the way the taqwīms of the erudite munajjims do. In these malhama texts, general prognostications are expressed in the format of protases and apodoses: “If X [a certain type of easily observable celestial phenomenon or a meteorological incident such as a solar eclipse, lunar eclipse, thunder, rainbow, lightning, etc.] occurs on the first day of the month Y, then it signifies...” But unlike taqwīms in which munajjims had to carefully calculate in mathematical terms the exact celestial configuration at the time of the solar revolution, malhama texts do not exert any such effort.\(^{17}\)


\(^{17}\) I should make a distinction here between the texts that belong rather to the genre of apocalyptic malāḥim and those malhama texts used for interpreting the signs of celestial and meteorological phenomenon for divinatory purposes. The first kind of literature dates as far back as the time of the Prophet Muhammad and is oriented toward debating, on lettrist grounds, the imminence of the End Times and predicting the fate of dynasties as well as individuals. It is the second group of texts with which we are concerned here. On the importance of the first group of texts, see Muhammad Ahmad Masad, “The Medieval Islamic Apocalyptic Tradition: Divination, Prophecy and the End of Time in the Thirteenth Century.” (Ph.D. Dissertation, Washington University in St. Louis, 2008).
In a similar fashion, a set of texts that I classify as “lay textbooks” intends to give instructions about casting birth horoscopes on the basis of a newborn’s ascendant/horoscopus (ṭāliʿ). As we will see in more detail below, the mathematical computation of the degree of the ascendant is central to any serious astrological endeavor. Once the munajjim establishes its degree, which corresponds to the first astrological house, he or she can easily calculate the remaining astrological houses (which is called “equalization of the houses”) and establish other necessary astrological variables. In the taqwīms—which were in fact nothing but horoscopes cast on the basis of the celestial map at the exact moment of the revolution of the year—and other horoscopes, munajjims always start with computing the degree of the ascendant. In the set of these folk nativity texts, however, the authors suggest simple lettrist and numerological explanations to designate the degree of the ascendant, without any mathematical or astronomical basis. In one particular example attributed to a certain Ḥayreddīn Konevī, produced likely in the late sixteenth or early seventeenth century, the author says the following as regards to the procedures underlying his astrological practice:

“If you would like to know the ascendant/fortune of a person, to predict his/her path and length of life, and to learn about his/her well-being or sickness, add the numerical value of his/her name to the value of the name of his/her mother. Then subtract the sum by twelve. If the remainder is one, then his/her ascendant is in Aries; if it is two, then it is in

In its simplest and broadest sense, the science of astrology, be it the learned version of the erudite munajjims or the lay one devoid of mathematical refinement, relied upon the basic Hermetic concept and fundamental Aristotelian principle, “as above, so below.” That is to say, what happens in the terrestrial world (i.e., ʾālam al-kawn wa-l-fasād, the world of generation and corruption) is necessarily linked to the celestial world. What I define here as “learned astrology”, however, was the scientific practice sensitive to the idea that every individual celestial configuration in a given time at a specific location had a particular influence on the sublunary world and that that influence could be explained and further predicted through the careful mathematical and astronomical study of celestial bodies, movements, and positions. For learned astrology, the examination of the celestial world and the ability to map individual celestial configurations required a solid training in the mathematical sciences (i.e. al-ʿulūm al-riyādiyya or quadrivium, composed of geometry [handasa], arithmetic [aʿdād], hayʿa, and music [mūsqīl]), because in the Aristotelian concept of knowledge, which was widely adopted in the medieval Islamicate intellectual setting, mathematics is the language of the celestial realm.

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18 British Library Add. 5983, 17b: “dilerseñ kīm bir kisīnuñ tāliʿūn bilesūn ve ānuñ sereģūzestūn bilesūn ve ʾömrūn ve ḥastalığun bilesūn ve kaç yaşından berüsi var bilmek dilesen kendi adun ve anasu adun hisāb idesūn. On ikişer on ikişer ṭarḥ idesūn, göresün kaç kalursa, eger bir kalursa Ḥamelˈdīr ... iki kalursa Şevr...”

19 The Aristotelian division of knowledge corresponds to the tripartite division of the entire universe into the divine, celestial, and terrestrial realms. Accordingly, there is a threefold division of the speculative sciences (al-ʿulūm al-ḥikamiyya al-nazariyya) into Metaphysics (al-ʿulūm al-ilāhiyya), Mathematical Sciences (al-ʿulūm al-riyādiyya), and Natural Sciences (al-ʿulūm al-ṭabīʿiyya). The mathematical sciences deal with the celestial objects, their physical structures, motions, sizes, etc.; whereas the natural sciences study the “matter” and changes in the terrestrial realm. For a brief discussion of how the threefold division of the episteme parallels
In other, and mathematically less informed forms of astrology, however, a minimally sufficient knowledge of the qualities of celestial phenomena is wedded to a crude mystical and numerological interpretation of the cosmos. One can refer here to Ibn ʿArabī’s teachings as the prime example of what Titus Burckhardt calls “mystical astrology.” The basic idea behind it is to establish an interpretive framework of correspondences between the seven planets, 12 signs, 28 lunar mansions, and numerous other heavenly bodies, designed by God and operated through the mediation of spirits, angels, and hidden saints (rijāl al-ghayb). Each zodiacal sign is attributed to a particular angel, whereas each one of seven planets, all of which were considered cosmic intermediaries between the immutable world of the archetypes and the earthly center, was associated with a particular prophet residing there and a particular prophetic epoch/cycle occurring in the human history.

This should not leave an impression, however, that mystical astrology and learned astrology were mutually exclusive, and that munajjims trained in the mathematical and astronomical foundations of astrological practice were entirely aloof to the mystical interpretations of celestial configurations. Quite to the contrary, munajjims might have often resorted to discussions on the influence of hidden spirits (rijāl al-ghayb) by associating each day of the year with one particular spirit. In his introduction to the taqwīm (almanac-prognostication) of the year 967/1560, for instance, Yūsuf b. ʿÖmer el-Sāʿatī (d. later than 1560), one of the court munajjims at the time, says by explicitly referring to the shaykh al-muḥaqiqīn and qūṭ al-ʿārifīn Muḥīʿ al-dīn al-ʿArabī that each day of the month, the hidden spirits, which are grouped


20 Titus Burckhardt, Mystical Astrology according to Ibn ʿArabi, translated from French by Bulent Rauf (Louisville, KY: Fonsvitae, 2001).
into seven categories, move from one direction to another. As Yūsuf munajjim lays out, these hidden spirits include one qūb, two imāms, four awtād, seven budalā, twelve ruqabā, forty nujabā, and three hundred nuqabā, all of which makes three hundred and sixty-six, to wit, a full solar year. If one wishes to supplicate their help wherever she or he tends towards, then one should say the necessary prayer after performing ablutions and offering a two-rakat prayer.²¹

The more mathematical and technical forms of astrology that try to calculate and interpret celestial influences of particular moments upon terrestrial events are composed of different branches and genres of writing. Mawālīd (genethialogy, or natal astrology), for instance, specifically deals with interpreting the celestial configuration at the moment of an individual’s birth to predict the course of his or her life. Closely related to the mawālīd genre, the anniversary horoscopes of the birth of individuals (taḥāwil sinī l-mawālīd) or the revolutions of solar years (taḥvīl-i sāl-i ālem) were routinely prepared in order to interpret the fortunes of the upcoming


Interestingly enough, in none of the other eight extant taqwîms that Yūsuf munajjim composed does such a section on ricalu’l-gayb take place.
year for a single individual or society in general. It is this particular branch that formed the essence of the *taqwīm* genre, which I will explore in more detail in the fourth chapter. Another common astrological practice is *ikhtiyārāt* (“Elections”), which is concerned with the choice of the auspicious moment for doing a particular activity or avoiding a specific action. The repertoire of activities ranges from quotidian matters such as when to go to the public bath or cast a talisman to issues concerning imperial policies like when to embark upon a military campaign or lay out the construction of a civic building. Furthermore, *Masāʾil* (“Interrogations” or horary astrology) is applied to interpret the exact timing and subject matter of a question the client asks the *munajjim*. In this particular genre, the celestial configuration of the exact moment when the client poses the question is crucial for the astrological interpretation. The questions asked by the querent touch on many quotidian aspects of life including marriage, travel, and household affairs. Last but not least, historical astrology, which was especially popular under the early Abbasids, focuses upon planetary conjunctions, particularly of Saturn and Jupiter, to explain the cycles of change in terrestrial events such as the rise of the prophets, turns of dynasties, or succession of rulers.  

Although each of these branches and genres of astrological practice might have had recourse to different techniques, what is central to all of them is the need to determine the exact celestial configuration at a particular moment in a given locality, be it a moment of birth, [22]

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revolution of the year, or an auspicious moment to embark upon a specific activity. In order to make an astrological judgment for the relevant time and latitude of the particular location, the munajjim had to establish the degree of the ascendant/horoscopus (ṭālīʾ), which then was followed by equalizing the cusps of other astrological houses and locating relevant astrological variables (dalāil). The determination of the ṭālīʾ was so crucial in astrological predictions that in vernacular Turkish the word gradually transformed into ṭāliḥ, signifying fortune and luck.

For these sorts of mathematical and astronomical operations (aʾmāl-i nujūmī), munajjims may have utilized instruments like astrolabes, but given the unaffordable costs of personally possessing sizeable and accurate astronomical instruments, for the most part they determined planetary positions by appealing to the astronomical tables (zīj) already in circulation. Despite the reluctance of modern scholarship to emphasize the role of astrological purposes in zīj production, these texts were munajjims’ indispensable tool for making the necessary calculations before conveying astrological interpretation. It would not be far-fetched to liken medieval zijes

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23 In birth horoscopy, for instance, prorogators like haylāj and kadkhudāh as well as tasyīr were to be determined; whereas in ikhtiyārāt the relative motions of the moon were given precedence. Meniński clearly points out in his Thesaurus Linguarum Orientalium that, as early as the seventeenth century, ṭāliḥ, as the transformed version of ṭālīʾ, was documentedly in use in vernacular Turkish. See his Thesaurus linguarum orientalium Turcicae-Arabicae-Persicae = Lexicon Turcico-Arabico-Persico (İstanbul: Simurg, 2000): “ṭaliʾ”, vulg. taliḥ. 1) part. Oriens, prodiens; 2) pl. ṭawālīʾ. Primum diluculum; 3) Horoscopus. 4) Sors, fortuna.

24 For the use of astronomical tools, specifically of astrolabes, in astrological problems see: Josep Casulleras, “The Instruments and the Exercise of Astrology in the Medieval Arabic Tradition,” Archives Internationales d’Histoire des Sciences 63, no. 170-171 (2013), 517-540. It is one of the standard themes in the writings of astral experts that conducting a celestial observation with reliable instruments is a costly business that required the financial support of a patron ruler. See, e.g., fn. 33 or 37 below.

to modern computer programs with which one could have manually designated planetary positions. Since the practice of any kind of learned astrology rested upon the careful designation of the celestial configuration at a particular time for a given location, zijes provided the munajjims with the necessary data and/or methods to make their own computations.

The most important set of data zijes presented was the tables listing the motions of planets in sexagesimal numbers. These tables particularly helped munajjims to compute the true longitude of each planet (taqwīm al-kawākib) in a given moment, necessary for making subsequent astrological calculations.\textsuperscript{27} The data covered in the zijes show significant variances due to the quality and length of the conducted observations. Almost all munajjims genuinely knew that in order to obtain more accurate results from the observations, at least thirty years of systematic observation should be undertaken, because Saturn, the outermost planet in traditional cosmology, takes around thirty years to complete its rotation through the ecliptic.\textsuperscript{28} Another factor that determined the accuracy of observations was the soundness of astronomical instruments available in the site of observation. The contention of the experts was such that the


\textsuperscript{27} Benno Van Dalen, “An Introduction to the Mathematics of Islamic Astronomy and Astrology” (Unpublished paper). I am grateful to Benno Van Dalen for sharing his unpublished work with me. Edward Kennedy also details, on the basis of Jamshīd al-Kāshi’s Zīj-i Khāqānī, the mathematical procedures involved in astrological operations. See Edward Kennedy, “On the Contents and Significance of the Khāqānī Zīj by Jamshīd Ghiyāth al-Dīn al-Kāshī,” in \textit{Islamic Mathematics and Astronomy} v. 84, ed. Fuat Sezgin (Frankfurt am Main: Institute for the History of Arabic-Islamic Science at the Johann Wolfgang Goethe University, 1998).

\textsuperscript{28} Aydın Sayılı, \textit{The Observatory in Islam, passim}. It is mentioned in Ḥasan Beg Rumlu’s \textit{Aḥsan al-tawārikh} that Shāh Ismā‘īl decided to build a new observatory upon seeing the remnants of the Maragha observatory; but as his munajjim told him that it required at least thirty years of operation to have better observational results, he abandoned his plans to construct the observatory. See \textit{Ibid.}, 166.
bigger the instruments, the more accurate the observations could be.

These rather theoretical remarks are best exemplified in the introductory prose sections of zijes where the authors explain the reasons and occasions for conducting a systematic observation and thus composing a new zij. In the Zīj-i Īlkhānī, for instance, Naṣīr al-Dīn Ṭūsī explicitly writes that it is crucial to observe and calculate the positions of celestial objects if one wants to have foreknowledge about earthly matters such as the security of the country, warfare and peace among rulers, the health and disease of individuals, the circumstances of agricultural production and market prices, weather conditions, and the fortunes of newborns. According to Ṭūsī, astrological judgments about these matters could only be arrived at with a precise knowledge of celestial positions, and the knowledge of celestial positions could only be calculated by systematic observation.29 Once the positions of celestial objects in each and every day were established through laborious observation, this information was recorded in tables. By utilizing the data and methods covered in these tables are taqwīms produced on a yearly basis, designating the positions of celestial bodies across the year and deriving related astrological predictions. Ṭūsī shares his wish that his new zij would become the main reference work for

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29 BML Or. 24, 3b: “Sukhan dar raṣad-i sitāragān va anki raṣad va zīj va taqwīm cha bāshad: ... bi-dānistan-i raṣad-i mavzī-ʾi sitāragān bar āsumān va payvastan-i ʾishān ba-yakdigar va judā shodan va miqār-i davrī-yi ʾishān az yakdigar va az zamīn va miqār-i raviš-i ʾishān maʿlūm shavad va az dānistan-i ān ḥukm tuvān kard ki baʾd az ʾin dar ʾālam cha khāhad būd az amīnī va parīshānī va sulḥ-i pādishāhān bā-yakdigar va ḥarb va gardish-i rūzdār va tandorostī va bīmārī-ī khālq va vābā va fārāhī va tangī-ī narkhāh va bārandaqī va khushgī va digar ḥalḥāh va hamchunin hāl-ī har farzandi ki dar vujūd āyad va dirāzī-ī ʿomr va kūthāhī va nik-bakhtī va bad-bakhtī va tandorostī va ranjūrī va tuvāngarī va ...ranj u rāhat ki badū rāsād. Īn hama az mavzī-ʾi sitāragān tuvān dānīst va mavzī-ʾi sitāragān ki har vaqt har yakī kojā bāshand natuvān dānīst tā raviš-i ʾishān nadānand.”
munajjims in preparing their almanac-prognostications (taqwīm) and casting horoscopes.\textsuperscript{30}

Despite Ţūsī’s expectations about the prospect of his work, contemporary munajjims and subsequent generations of astral experts did not much favor the original Zīj-i Ilkhānī, due mostly to the limited timespan of actual observations in its preparation. Many practicing munajjims at the time complained about the extreme inconsistencies (tafāvut-i fāhish) frequently emerging between observed celestial phenomena and ones calculated on the basis of Ţūsī’s tables. 'Alī-Shāh Bukhārī, a noted astral expert from the late thirteenth century Iran, whose astrological summa, Asmār va ashkār, later became one of the favorite texts of Ottoman munajjims, narrates in his Zīj-i 'umda-i Ilkhāniyya that one day a group of people approached him and asked his sincere opinions about the Zīj-i Ilkhānī. In ‘Alī-Shāh Bukhārī’s narrative, the people are apparently highly critical of Ţūsī’s zīj, saying that when they tried to calculate the true longitude of the Sun (taqwīm-i Shams) to determine the degree of the ascendant, there emerged extreme discrepancies, to their chagrin, between the calculations made on the basis of Ťūsī’s zīj and those on earlier available tables.\textsuperscript{31}

‘Alī-Shāh Bukhārī, however, seems to have been sympathetic toward Ţūsī’s Zīj. He maintains that the reason Ťūsī intended to undertake a systematic observational enterprise in the

\textsuperscript{30} Ibid., 3a: “umidvāram km muvāfiq-i riżā-yi ā bāshad tā ba-davlat-i ā munajjimān ba’ād az ān zīj taqvīmāhā va tāli’ā hā birān mī āvorand va nām-i īshān tā hazārān sāl dar jihān bāqī bāshad…”

first place was his realization that there were many inconsistencies between the calculated celestial positions on the basis of zījes in circulation and those observed in person, particularly lunar and solar eclipses as well as conjunctions. Ṭūsī then assembled in Maragha an impressive number of astral experts from adjacent regions and collected a rich body of the state-of-the-art astronomical instruments, but he did not live long enough to personally complete the observation program. As Alī-Shāh Būkhārī underlines, preparing a zīj is a hefty business that requires the systematic observation of the stars (rašad). Rašad, however, is contingent upon many factors including the existence of sufficient financial means, physical space, human resources, precise instrumentation, and plentiful amounts of time to conduct different sets of observation with patience. He concludes his exposition here by saying that every new rašad is more accurate than the previous one, due likely to better instrumentation and longer observation. In view of the deficiencies of Ṭūsī’s tables, another and more accurate rašad should be implemented so that the future course of worldly affairs could be predicted after the ascendant of each year is designated and the celestial positions are determined. As Alī-Shāh Būkhārī’s anecdote implies, there were many experts at the time who were critical of Ṭūsī’s elaboration in the Zīj-i Īlkhānī. Wābkanawī, for instance, details in his Zīj-i

32 Ibid.: “Chūn bi-sālhā tafāvut-i fāhish dīda būd dar mavażi’-i kavākib, rašad farmūd kardan va agharcha ālat va ’adat-i biyār dāsht ki az atrāf-i mamālik jam’ karda būdand chandīn nav’-i digar basākht va yaqīn ast ki ān cha khāja ra muyassar shoda būd. Hīch šāhib-i raṣadi rā nashoda bāshad. Ammā ruzzgār vafā nakard ki ba-ītmām rasānīde.”

33 Ibid: “hīch shakk nīst ki sākhtan-i zīj kārī-yi ’azīm ast va ta’alluq ba-rašad-i kavākib dārad va rašad-i kavākib mavlūf bā-māl va jāh va yāran va ālāt-i šāhib va ruzzgār-i dirāz va farragat va asl-i albāb-i shakhsī ki dhinn-i sāfī va ṭab’-i salīm darad.”

34 Ibid: “Pūshda nīst ki har raṣadī ki kardā-and kāmīltar az rašad-i pīshtar ast...Pas vājib konad ki rašad-ī ākhir akmāl bāshad va ba-kusūfāt va miqdār-i sā āt va rū yat-i ahīla sīhāt-ī in rašad ma lūm mī shavad va dar umūr-i ‘alam har ḥālī ki az ālī-ī sāl va avżā’-ī kavākib mutavaqqa’ ast məvjaḏ mī gardad.”

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muḥaqqaq-i Īlkhānī the extent of inconsistencies between the observed celestial phenomena and their respective values calculated with reference to the Ilkhanid tables. In one of his examples, Wābkanawī says that in the year 684 A.H. (1285 in Common Era) a conjunction between Jupiter and Saturn occurred in the ninth degree of Aquarius. However, the difference between the actual observed time of this conjunction and the time previously calculated on the basis of the Zīj-i Īlkhānī was around fifteen days. As Wābkanawī himself clearly underlines, the conjunction of the two superior planets is of extreme astrological significance, for it rules worldly phenomena. Hence the implication is that the inaccuracies led by impaired celestial data would inevitably cause unfavorable consequences.

The observation program at the Samarqand observatory in the mid-fifteenth century had the similar intention of rectifying the celestial data tabulated in the available zījes. As it will be detailed in the second chapter, the munajjims serving the Ottoman court were aware of the Ulugh Beg tables as early as the late 1460s, although they seem to have favored, at least until the 1510s, different editions and commentaries of the Zīj-i Īlkhānī corpus. From especially the second decade of the sixteenth century on, Ottoman munajjims utilized the Zīj-i Ulugh Beg almost exclusively for their calculations. However, the Ulugh Beg tables were also not exempt from the criticism of some astral experts, due to the same reason: discrepancies emerging between observed and calculated celestial phenomena. In the mid-1480s, for instance, Khitābī munajjim, a

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Persian émigré at the court of Bāyezīd II (r. 1481-1512), about whom more information will be provided in the third chapter, made solar observations in Istanbul to test the data provided by three popular zījes of the time: the Zīj-i Īlkhānī, the Zīj-i Ulugh Beg, and the Zīj-i Jāmi’ of his master Rukn al-dīn Āmulī. Based upon his calculations, and of course thanks to his intellectual proximity to his own teacher, he found Rukn al-Āmulī’s work more accurate than the others and did indeed use it when preparing his own annual almanac-prognostications. In another case, in an undated short report on the uses of talismans and celestial magic, intriguingly attributed to Ibn Kemāl (d. 1534), the famous sheikhulislam of the early years of Suleymān’s reign (r. 1520-1566), the author asks for royal support for undertaking a systematic observational program in Istanbul, because the available zījes in circulation, including the Ulugh Beg tables, fail to produce consistent and accurate results. There are doubts about the attribution of this treatise to Ibn Kemāl and the earliest surviving copy of the text with an identifiable colophon dates only to 1596. Nonetheless, the treatise was almost certainly written before the 1570s, because at that

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38 There are six known copies of this short treatise, the earliest of which is located as SK Esad Efendi Ms. 3782. Other copies include SK Hacı Mahmud Efendi Ms. 5584, SK Reisülküttab Ms. 1199 (two different copies in the same volume), SK Şehid Ali Paşa Ms. 2795, and Cidde Camiat Abdülabiz Ms. 1378.
time an observatory was built in Istanbul on the initiative of the famous munajjim Taqī al-dīn (d. later than 1585) and with the support of Sultan Murād III (r. 1574-1595) and his chief advisor Sa’deddīn (d. 1599). It would be intriguing for a number of reasons to have a prominent “religious” scholar at the caliber of Ibn Kemāl penning such a text on celestial magic, but regardless of the question of its authorship, the treatise is still an important source showing unequivocally that the zījes were definitely used for astrological and divinatory purposes, and that the accuracy of astronomical data covered in these tables was the primary concern of the munajjims.

Aside from the zījes, several other works written on astronomical instruments or astrological techniques also clearly demonstrate that learned astrological practice certainly demanded astronomical and mathematical know-how. Rūkn al-dīn Āmulī, a relatively significant astral expert from Shīrāz from the first half of the fifteenth century, provides us with the most

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Given that the autograph copy is not available and none of the extant copies survives from his lifetime, we have every reason to question the attribution of the authorship of this short treatise to Ibn Kemāl. However, all the relevant modern studies that try to establish the complete oeuvre of this prolific ʿālim, who composed more than two hundred works in almost every branch of knowledge, include this text as an authentic work of Ibn Kemāl. See: Nihāl Atsız, “Kemalpaşaoğlu’nun Eserleri I,” Şarkiyat Mecmuası 6 (1966), 71-112; “Kemalpaşaoğlu’nun Eserleri II”, Şarkiyat Mecmuası 7 (1972), 83-135; Yekta Saraç, Şeyhülislam Kemal Paşazade. Hayatı, Şahsiyeti, Eserleri ve Bazi Şiirleri (İstanbul: Risale, 1995); Şamil Öçal, Kişladağ Medreseye: Osmanlı Bilgini Kemalpaşazade’nin Düşünce Dünyası (İstanbul: İz, 2013).
There is also circumstantial evidence that Ibn Kemāl was interested in sister divinatory practices like bibliomancy and lettrism. For instance, he presented Selīm I a short report in which he interpreted the numerological significance of a Quranic verse (21: 105) as a good omen and clear victory of the Ottoman sultan against the Mamluks that would happen after 1514. See: Mustafa Kılıç, “İbn Kemal’in Misr fetihine dair bir risale-i acibesi,” Diyanet 26/1 (1990), 111-120.

Taqī al-Dīn also emphasized the need for revising tables (zīj) when he approached the sultan and expressed his demand to establish an observatory for conducting a systematic observational enterprise. See Aydın Sayılı, “Alâuddin Mansur’u’nun İstanbul Rasathanesi Hakkndaki Şiirleri,” Belleten v. 20, n. 79 (1956), 411-484; Remzi Demir, Takıyuddin’de matematik ve astronomi: Cerridevi’de döğer ve haridetü’l-fiker üzerine bir inceleme (Ankara: Atatürk Kültür Merkezi Başkanlığı, 2000).
succinct expression of the reliance of astrology upon mathematical and astronomical knowledge. In his treatise on the uses of the astrolabe (Risāla panjāb bāb), Rukn al-Dīn says that he has spent most of his life studying philosophical sciences ('ulūm-ī ḥikmī), especially the mathematical sciences ('ulūm-ī riyażī) including hay′a, handasa, and hisāb. There is no doubt for Rukn al-Dīn that the “fruit” and reward of studying these sciences, aside from acknowledging God’s omnipotence and his cosmic design, is to be able to make (astrological) judgments ('ilm-ī aḥkām) and accurately measure the time. This, however, relies upon the ability to observe the stars, calculate the mean motions of planets, and designate the ascendants of the hour. The astrolabe is, for Rukn al-Dīn, the best instrument to perform these sorts of astronomical operations, which are necessary for casting horoscopes and practicing electional astrology.  

As Rukn al-Dīn makes it explicit in his text, munajjims had to undertake these complex astronomical operations before articulating astrological interpretations. The entire taqwīm genre, which I will delineate in the fourth chapter, provides an example par excellence of how munajjims pronounced their astrological predictions only after they laid out the necessary astronomical indicators by making demanding calculations on the basis of the zājes. Aside from the taqwīms, extant birth horoscopes also serve as a strong example. In the surviving horoscope of Mīrzā Rustam b. ‘Umar Shaykh prepared in 1419, the munajjim Yaḥyā b. ‘Imād—who was

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40 SK Ayasofya Ms. 2667, 2a-2b: “ki chūn dar akṣar-i avqāt ishtigāl-i in faqīr bi-‘ulūm-ī hikmi būda bi-takhṣīs ‘ilm-i Hay′a va handasa va hisāb ki az usūl-i ‘ilm-i riyażī and ... Muqarrar ast ki samara-i in ‘ulūm ba’de az vasīla bi-ma’rifatillāh ‘ilm-i aḥkām va ma’rifat-i avqāt ast. Valān navqāf ast bi-ma’rifat-i rasād-i sitāragān ve istihkhrāj-i taqwīm-i kavākib ve tavāli’i sā’at. Va bihtarīn alātī ki ḥukamā′ az jihat-i in ‘amāl važ′ karda-and uṣṭurlāb ast ki istihkhrāj-i taqwīm-i kavākib va tavāli′ va ma’rifat-i avqāt va masāḥat az u ma’lūm mi shavad. Vala rasā’il ki dar ma’rifat-i an navashta and dar a’māl-i masā′ il′i ān ri’āyat-i tarifb nakarda and va istihkhrāj-i taqwīm-i kavākib va bāqī a’māl-i nujūmī ki dar šūrat-tāli’i vilādat ve ikhtiyyārāt badān muḥtāj mi shavad nayāvorda.”
likely the son of the munajjim who prepared the famous Mīrzā Iskandar horoscope—first lays out in a very detailed fashion the necessary mathematical and astronomical information about the celestial configuration at the time of Rustam’s recorded birth date. This part constitutes the first sixty-three folios of the eighty-four-folio manuscript. As his wordings clearly suggest in the section where he shifts to the astrological interpretation of these celestial indications, a munajjim can only start the aḥkām after he or she carefully determines the zodiacal degree of the ascendant, equalizes all the remaining astrological houses, tabulates the true longitudes of seven planets as well as the fixed stars and astrological lots, establishes the prorogators (e.g., haylāj, kadkhudā, tasyīrat, intihāʾ āṭ), designates the ascendants of the revolutions, and undertakes all other sorts of operations upon which relied the science of the judgments of the stars.41 In the eyes of Yahyā munajjim, and in fact many other astral experts from the period, to interpret the decrees of the stars was in fact the desired end of calculating planetary positions.42

One can easily find among the writings of those munajjims serving the Ottoman court a similar attitude toward nujūm and aḥkām. In the few extant annotated Ottoman birth horoscopes descending from the late-fifteenth and the first half of the sixteenth century, which I will mention in more detail in the fifth chapter, the munajjims first sketch in a detailed fashion the celestial map at the time of the reported birth. Once all the relevant signs are established, he or she starts deriving the astrological decrees. For example, the birth horoscope of Meḥmed II produced by

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41 Huntington Library Ms. HM71897, 64b: “Chūn fārīgh koshīm az aʾmāl-i ḥisābī va ḵavābīt-i nujūmī va qavāānīn-i ʿilm-i riyāẓī ki ān istikhrāj-i tavārīkh ast va taṣḥīḥ-i daraja-i ṭāḥī-i humāyūn va tasvīyat al-buyūt va taqāvām-i kawkīb-i sābʿa va ṣābīta va sīhām va ṭurūḍ va abʾād-i ʾishān az dāʾ īra-i muʿaddal al-nahīr va maṭāliʿ-ī mamarr va maṭāliʿ va mughayyab va ṭurūḍ-ī āfāq-ī ḥādisa va maṭāliʿ-ī muṣahhaḥa va maṭrāh-ī shīʿ āṭ va maṭrāh-ī anvār va taʿyīn-ī haylāfīt va ṭāṭāyāʿ-ī kadhkhudāḥāt va tasyīrāt va intihāʾ āṭ va ṭavāliʿ-ī taḥvīlāt va firdārāt va sāʿ ir aʾmāl ki madār-ī aḥkām-i nujūmī bar ān ast.”

42 Ibid: “[A]ḥkām ki ʾsamara va natāvīṣ-ī īn dālāʾ il ast.”
Khiṭābī in the late 1470s clearly employs this structure. Khiṭābī elaborates in the first two hundred folios of the horoscope the demanding celestial data at the time of Meḥmed II’s reported birth.\textsuperscript{43} In a similar vein, in the horoscope Lütfullāh munajjim, one of the court munajjims in the early 1530s prepared for a certain Maḥmūd b. Muḥamed, he explicates and tabulates in sixty-five full folios the astronomical indications and values of the celestial configuration at the time of his nativity, which apparently occurred on 12 Muḥarram 895/December 6, 1489.\textsuperscript{44} The copy seems to be incomplete, as it does not include the ensuing aḥkām part. It is also probable that Lütfullāh provided the astrological interpretation verbally. No matter what the actual content of the aḥkām, this surviving horoscope clearly shows us that detailed astronomical calculations made on the basis of available zījes constitute the fundamentals of learned astrological practice.\textsuperscript{45}

Despite the fundamental agreement of astral experts upon the premise that valid aḥkām depended strongly upon accurate knowledge of nujūm, many of them also acknowledged the epistemological nuances between the two. As briefly noted before, not all experts were eager to draw astrological decrees from the celestial positions they could successfully calculate. Moreover, the great majority of munajjims were genuinely aware of the limits of the aḥkām as a practice. In the next section, in addition to presenting the personal opinions of certain munajjims vis-à-vis the scientific restraints of the ‘ilm-i aḥkām (al-nujūm), I will discuss how the nuances

\textsuperscript{43} TSMK Yeni Yazmalar Ms. 830, 200a: “Faṣl fi al-aḥkām: chūn az taṣḥīh-i daraja-i ṭāli‘ va ta‘yīn-i haylāj va kadkhudhāhāt va urūd-i āfāq-i kavākib va tasyīr-i avtād fārīgh shodim khāstīm ki aḥkām-i duvāzdah khāna ra mujmalan bayān konīm. Ba’d az ān aḥkām-i har sāl ra ‘alā t-tafsīl irād konīm.’”

\textsuperscript{44} Kandilli Observatory Library Ms. 325.

\textsuperscript{45} One specific chapter of Lütfullāh’s horoscope is called “calculating the true longitudes of seven planets at the time of birth by using the information in the Ulugh Beg tables prepared according to the observational enterprise in Samarqand.” (dhikr-i istikhraj-i taqvīm-i kavākib-i haftgāna az zīj-i sulṭānī bi-raṣad-i Samarqand bar vaqt-i vilādat.”) Ibid., 9a-10b.
between *ahkan* and *nujum/hay'a* were interpreted and reinterpreted in the highly complex taxonomy-of-science tradition in medieval Islamic writing.

I. 3. **Astrology in the Medieval Islamicate Classification of the Sciences**

Reluctance toward the practice of *ahkan* finds poignant expression in a pardon letter written by an anonymous *munajjim* who seems to have served the Ottoman court around the turn of the sixteenth century. In this undated letter located in the folder of written communications from the time of Bāyezīd II (r. 1481-1512), the anonymous *munajjim* asks in Persian for the sultan’s sympathy and forgiveness, because, as he admits, he has recently failed to present him with annual almanac-prognostications (*taqwīm*). The *munajjim* mentions two reasons for his recent inattentiveness. Firstly, he says, his attention has recently geared more toward medicine (*ṭibb*) than *nujūm*. Secondly and more strikingly, he maintains that since becoming older and closer to death, dealing with *nujūm*, especially the *ahkan* has been giving him more grief and uneasiness. In the last part of his letter, the *munajjim* again proffers his apology and desperately pleads with the sultan to reemploy him in his service.\(^46\)

As a vivid testimony to the personal reflections of a practicing *munajjim* about his own craft, the letter unequivocally documents that in the eyes of the practitioners, the boundaries between *ahkan* and *nujūm* were in fact quite evident, and that the controversial nature of astrological practice on religious grounds was fraught to the extent that practitioners might even think of abandoning their major source of income. This letter, however, is not the only instance

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\(^{46}\) TSMA E. 10159/145: “[dar īn ayyām muyassar nashod ki bi-istikhrāj-i taqwīm mashgūl shavad ... az chand jihat yakī az ishtigāl bi-muţāla’ā-i ṭibbiyya ammā māni’-i kullī ān ast ki īn kamīna rā vaqt-i īrthāl nazdik ast va ishtigāl bi-nujūmīyyāt siyammā bi-ahkanash mustalzim-i qasāvat-i qalb ast ... īn kamīna rā ’afv faramāyand va az rujū’-i khidmāt ki inshirāh-i ṣadr va tanavvur-i qalb bi-ān ast īn kamīna rā mahrūm nagodhārand.”
where a practicing munajjim implies his disdain, or at least skepticism, toward astrology. In many examples of the taqwīm genre one can find similar remarks where munajjims carefully draw attention to the epistemological limits of āhkām as a science.

One of the standard arguments frequently repeated, often almost verbatim, in different taqwīms by various munajjims is the inability of human perception and experience to understand the infinite amount and kinds of celestial influence upon the sublunary world. For many astral experts, knowledge of celestial configurations derived through experience (tajriba) and observation does not suffice to meet the virtually limitless occasions where astrological predictions may be applied.47 For example, in the taqwīm produced for the year 900/1495, the anonymous munajjim rhetorically asks which created being in the world is capable to fully comprehend the numerous celestial influences constantly descending upon the terrestrial realm. Hence, says the anonymous munajjim, experts in astrology (arbāb-i āhkām) cannot escape from making mistakes. Yet, past authorities of this science exposed several points by means of analogical reasoning (qiyās) and experience (tajriba), and reached the conclusion that the terrestrial objects are indeed obedient to the forms of the world of the spirits. As Ptolemy already demonstrated and Abu Ma’shar later commented upon, according to this anonymous munajjim, the forms in the world of composition are administered by the celestial forms.48

47 Tzvi Langermann has also demonstrated in one of his recent studies that the category of experience (tajriba) had a significant place in late medieval and early modern epistemological discussions, particularly in the fields of applied arts and sciences including astrology. See: Tzvi Langermann, “From My Notebooks. On Tajriba/Nissayon (“Experience”): Texts in Hebrew,, Judeo-Arabic, and Arabic,” Aleph 14/2 (2014), 147-176.

48 TSMK R. 1711/1, 3a: “har laḥza va lamḥa ḥaṣarḥ-ī nāma’dūd va nazahrā-ī nāmahdūd az ālām-ī ṭulī ba-qarargāh-ī suftī nāzil mī shavad ki kodām mahlūq rā quvat-i idrāk va irāda-i an jumla tavānād bovd? Pas bar in muqaddima ma lūm mī shavad ki arbāb-i āhkām rā sahvhā-ī bisyār oftad. Ammā ba-in ma nā hama bar sabīl-i qiyāsāt va tajriba ustādān-ī in ‘ilm hama
کاریابانگی وافا و باز نامیده و کی عوارض و بار عوارض 'الام-ی ار váh rā کنی باطلمیوس دار کتاب-ی اسماء غورد و کی یارح-ی ان را استاد آبی'-ل-مشر بالکه ... کنی کاردا اس 'ال-عوارض عالی fā 'الام-التارکب معت[اف]ون لی š-عوارض ال-فalıkیا."

49 See TSMK B. 313, 1b-2a (taqwīm of 901/1496); TSMK B. 320, 2a (taqwīm of 907/1502); TSMK B. 321, 1b (taqwīm of 907/1502); TSMK EH. 1712, 1b (taqwīm of 909/1504); TSMK R. 1711, 172a (taqwīm of 915/1510); TSMK EH. 1710, 9b-10a (taqwīm of 919/1513); TSMK R. 1711, 249b-250a (taqwīm of 920/1514); TSMK R. 1711 (taqwīm of 923/1517); TSMK EH. 1695, 1b (taqwīm of 925/1519); TSMK R. 1711, 366b (taqwīm of 937/1531).

Just to exemplify these slight differences in the expressions, here are two passages, one from the taqwīm of the year 901/1496, and the latter from the taqwīm of the year 919/1513:


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(tasyīrāt), astrological lots (sihām), or the weakness and strength of the stars (żaʿaf va quvva-yī kavākib) are so numerous that it is a tedious task to successfully locate each and every one of them. Therefore, this science can explain very little about the future course of worldly affairs. Besides, such an intellectual endeavor is rested purely upon experiential (tajrubī) and speculative (zannī) grounds. He concludes this section by referring to a hadīth, a favorite one indeed among taqwīm composers: “Whatever Allah willed to be, shall be, and whatever Allah did not will to be, shall not be.”

It is clear from these remarks repeated almost verbatim by different munajjims that in the eyes of many practitioners astrology (ahkām) was a science based rather upon conjecture and experience than unwavering mathematical proofs and geometrical demonstrations (burhān-i handasī). The underlying empiricism, however, is impossible to fully attain, because the effects in the terrestrial realm of celestial configurations are countless, whereas the empirical data demonstrating these causalities is by nature episodic and fragmented. Moreover, the limited mental faculty of human beings is insufficient for understanding the infinite quantities and varieties of celestial influence upon the inhabited world. Moreover, no individual can assemble all the necessary experiential knowledge of celestial influences during his short lifespan. Yet, owing to the earlier observations and accumulated empirical results of previous generations of learned experts, and further applying analogical reasoning, one can still interpret how the future course of affairs in the sublunary world will run, though these interpretations are contingent. Due

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50 TSMK B. 320, 2a: “bā sā`īr dalā`il va shavāhid va ma`ārīh-i asha`i va anvar va intihā`at va tasyīrāt va sīhāmāt va mudabbirāt va gavāsīm va žaʿaf va quvva-yī kavākib va dalā`il ki ihšā-yī ān kamā yانbaghī muta`adhdhir va intīzāj kamā ḥaqqāhī muta`assīr. Binā bi-haşb-i ghālib-i žann va taʃārīb in fann shamma va dharra az umūr-i aḥvāl-i `ālam bāz namūd mī shavad. Mā shā`allāh kāna wa mā lam yashā` lam yakun.”
mostly to these internal restraints caused by the epistemological ambit of astrology, munajjims often adopt discreet language in their predictions and emphasize the highly probabilistic character of their craft by frequently employing such qualifications as “mumkin ast ki”, “yumkin…”, “yaḥtamilu”, “iḥtimāl-i…”, or “umūd ast ki.”

The epistemological controversies inherent in the practice of aḥkām are also present in the rich taxonomy-of-science tradition that flourished in the Islamicate culture especially after the tenth century as a response to the need of defining and classifying the increased amount of knowledge in circulation.51 By epistemological controversies I do not refer here to the religious sensitivities of pious Muslims. What is rather at stake here are the tensions deeply rooted in the science of aḥkām due to the discrepancies related to its subject matter, methods, and objectives. A great majority of heavenly experts acknowledged that the knowledge necessary for aḥkām was dependent upon the unchanging and prestigious mathematical knowledge of the celestial spheres. In fact, as evident from the works of Ptolemy, the authoritative pre-Islamic sources adopted in the Islamicate realm barely distinguished between mathematical/astronomical and astrological celestial activities. On the other hand, the same experts were already aware of the limits of the practice of aḥkām, as it fundamentally dealt with understanding and predicting the affairs that occur in the ever-changing terrestrial realm. Due to these dual characteristics of the science of aḥkām, encyclopedists and classifiers of knowledge in medieval Islamicate world struggled to situate it in a consistent manner.

As it was mostly the case in Greek and Latin tradition in the ancient world and the early Middle Ages, fuzzy borders between astronomy and astrology and the use of the overarching semantic category of “the science of the stars” are also found in pre-tenth century Arabic sources. Notwithstanding the nuances between them, Abū Bakr al-Khwārizmī (d. 847) in his *Mafātīḥ al-ʿulūm* 52, the Ikhwān al-Ṣafā’ in their epistles (ca. tenth century) 53, and al-Fārābī (d. ca. 950) in his *Iḥṣāʾ al-ʿulūm* all treat ‘ilm al-nuẓūm as a single category. 54 Yet al-Fārābī, despite his approaching it as a single science, grouped it into two main categories in a way that resonates well with Ptolemy’s discussion in his *Almagest* and *Tetrabiblos*: the first part (*ahlām al-nuẓūm*) investigates and interprets the indications of celestial objects for predicting future events as well as for interpreting past and present occurrences, whereas the second part (*ʿilm al-nuẓūm al-taʿlīmī*) studies the measurable features of the heavenly objects including their sizes, motions, or distances from one another. Al-Fārābī’s implications are quite clear that from a philosophical point of view only the second category of the science of the stars is valid. However, he never rejects the fundamental cosmological axiom of celestial causation on the sublunar world. Quite the contrary, he agrees with the idea that men of knowledge can rely upon experience (*taǰriba*) and observation to study the physical influence of celestial objects on the terrestrial world. However, echoing the arguments that would later be proffered by Ottoman *munajjims* in their

taqwīms, al-Fārābī finds the empirical foundation of astrology ineluctably inadequate. Al-Fārābī’s elaboration in his Iḥsā’ al-ʿulūm, in which he distinguishes the mathematical investigation of heavenly objects from the astrological study of celestial influences, prefigures the subsequent semantic and categorical distinction between ‘ilm al-hay’a and ‘ilm aḥkām al-nujūm. The real sea change came, however, with Ibn Sīnā, who brought a relative clarity to the astronomy-astrology debate after he systematically classified them into different epistemological units within the Aristotelian concept of knowledge. According to Ibn Sīnā, ‘ilm al-hay’a was an independent science whose subject matter and objectives were primarily defined by the use of mathematical demonstrations. For that reason, in his Risāla fī aqsām al-ʿulūm al-ʿaqliyya he groups this science under the rubric of the mathematical sciences (al-ḥikmat al-riyāḍiyya), which primarily concerned with studying the empirical aspects of celestial phenomena. Astrology (aḥkām al-nujūm), however, was classified as one of the branches of the natural sciences (al-ḥikmat al-ṭabīʿiyya) next to medicine and divinatory arts such as oneiromancy (‘ilm al-taʿbīr) or

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55 Al-Fārābī also treats the question of the efficacy and epistemology of astrology in a separate treatise called “Risāla fī mā yaṣīḥu wa-mā lā yaṣīḥu min aḥkām al-nujūm.” Here he states that the celestial objects influence the sublunary world not by their motions but by their light. Their effect, however, does not concern coincidental events such as the death of an individual at a particular moment of a celestial object’s movement. If such events could have been determined by such celestial configurations, then this would have upended social affairs, because in a world where everything is inevitable and determinable, then there is no need for individual effort. See “Bemerkungen des Abū Naṣr über die Richtig und Falschen astronomischen entscheid,” in Al-Fārābī’s Philosophische Abhandlungen, ed. Fr. Dieterici (Leiden: Brill, 1892), Arabic original 104-112; German translation 170-186. See also Therese-Anne Druart “Al-Farabi’s Causation of the Heavenly Bodies,” in Islamic philosophy and mysticism, ed. Morewedge, Delmar: 1981, 35-45; Joel Kraemer, Humanism in the Renaissance of Islam: The Cultural Revival during the Buyid Age, Second Revised Edition (Leiden: Brill, 1992), 160; Damien Jones, Method, Structure, and Development in al-Fārābī’s Cosmology (Leiden: Brill, 2012), esp. 44-57. 56 Ibn Sīnā, “Risāla fī aqsām al-ʿulūm al-ʿaqliyya,” in Tis’ rasāʾīl fī l-ḥikma wa-l-ṭabīʿiyyāt (Cairo: Maṭbaʿat Hindīyah, 1908), 105-6, 111.
physiognomy (ʿilm al-fīrāsā). In that regard, Ibn Sīnā takes the earlier discussion of al-Fārābī one step further and essentially decouples the two sciences by deconstructing the sweeping epistemological unit of the “science of the stars.”

The Avicennan epistemological model deeply influenced the later development of the taṣnīf al-ʿulūm genre, including the Ottoman examples. Even some leading experts of astral sciences in the post-classical Islamicate world such as Naṣīr al-Dīn Ṭūsī and Quṭb al-Dīn Shīrāzī (d. 1311) alluded to the same hierarchical classification in their own discussions with regard to the boundaries between hay’a and aḥkām. Ṭūsī for instance reiterated in his Nasirean Ethics that ‘ilm-i hay’a is part of the mathematical sciences (ʿulūm-i riyāzī), as it seeks knowledge of the motions and relative positions of celestial bodies. The science that aims at interpreting this knowledge in order to predict what will happen in the sublunary world, however, falls, according to Ṭūsī, into the category of the natural sciences, as these sciences are concerned with “matter” which is subject to change and corruption.

One can also find in Quṭb al-Dīn Shirāzī’s (d. 1311) encyclopedic work Durrat al-tāj the exact same categorization. Interestingly, Shirāzī uses ʿilm al-hay’a and ʿilm al-nujūm interchangeably in his exposition on the mathematical sciences (ʿulūm-i riyāzī). For Shirāzī, the third branch of the mathematical sciences, which he calls ‘ilm-i hay’a and sometimes ‘ilm-i nujūm, is the knowledge of the relative positions of the celestial objects, their motions, sizes, and physical features. As Shirāzī clearly underlines, the aḥkām-i nujūm is not within the purview of this branch. He later briefly mentions it as part of the natural sciences along with medicine,

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57 Ibid., 108-111.
Aside from the Maragha circle, the Avicennan epistemological hierarchy was also adopted in the Mamluk intellectual realm. In his *Irshād al-qāṣid ilā asnā al-maqaṣid*, the leading thirteenth-century Mamluk encyclopedist and noted physician al-Akfānī (d. 1348) closely follows the Avicennan/Aristotelian classification system by grouping the *ʿilm al-hayʿa* into the mathematical sciences and the *ahkām al-nujūm* into the natural sciences. According to al-Akfānī, the major aim in *ahkām* is to interpret the influences of celestial configurations upon terrestrial occurrences (*al-istiḍlāl bi-t-tashakkulat al-falakiyya ʿalā al-ḥawādith al-suflīyya*). The importance of this science stems from its utility to interpret the fortunes of countries, rulers, and other individuals. By having recourse to this type of knowledge, one can also determine the most auspicious moment to embark upon an activity. *ʿIlm al-hayʿa*, on the contrary, is the science of the celestial and terrestrial objects that studies their physical structures as well as the movements of celestial orbs and stars, their numbers and positions. Al-Akfānī also acknowledges that *ʿilm al-hayʿa* is a noble science with respect to its subject matter and soundness of its proofs. Moreover, this science helps the experts to measure time, which is important not only for observing religious rituals and facilitating social transactions but also for practicing medicine, astrology, magic, and husbandry. At the end of his discussion on the benefits of the *ʿilm al-hayʿa*, al-Akfānī discusses the extent to which one’s occupying oneself with the “science of the stars” (*ʿilm al-nujūm*) could be considered licit. His use of the term “science of the stars” here

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61 Ibid., 143: “wa bi-n-nisba ilā ḍabṭ al-ahwāl al-azmina fīhā yataʿalliq bi-l-ʿibādāt wa-l-muʿāmalāt wa aḥwāl al-ṭibb wa aḥkām al-nujūm wa aʿmāl al-siḥr wa-l-filāḥa.”
seems to comprise both *hay'a* and *aḥkām*, for he groups astral activities into five major categories:

i) Obligatory (*wājib*): when astral knowledge is put into practice to measure time for the observation of religious rituals.

ii) Recommended (*mandūb*): when astral knowledge is sought to study heavenly objects as the proofs of the existence of the omnipotent God.

iii) Permissible (*mubāḥ*): when practitioners use astral knowledge for astrological purposes while acknowledging that celestial bodies are influential only by divine providence not through their independent power.

iv) Disapproved (*makrūh*): when astrology is practiced with the belief in the unmediated power of heavenly bodies that act as independent agents.

v) Forbidden (*maḥṣūr*): when astrology is practiced with strict belief in astral determinism maintaining that celestial objects rule terrestrial events through their independent nature, and they thus qualify for being worshipped. As al-Akfānī makes it clear, the last category corresponds to blasphemy.⁶²

As is evident from al-Akfānī’s classification, in addition to the epistemological nuances

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⁶² Ibid., 143-144.
between *ahkām* and *hay’a*, the practice of astrology is further classified on the grounds of religious belief. While the attacks toward astrology on religious grounds will be discussed in more detail in the next section of this chapter, I should say that al-Akfānī’s position, leaving a legitimate place for the practice of astrology as long as the belief in the omnipotent God is not infringed upon, was quite widespread among both the authentic practitioners of astrology and the external supporters of the practice.

Ṭašköprüzāde, the most famous Ottoman encyclopedist of the sixteenth century, was a prime example of such a supporter. Like al-Akfānī and the earlier Avicennan tradition, Ṭašköprüzāde also acknowledges the differences between *ahkām* and *hay’a* by putting the former into the derivative natural sciences while classifying the latter among the mathematical sciences. In his introduction to the discussion on the *ahkām al-nujūm*, he repeats al-Akfānī verbatim and says that *ahkām* is a science deployed to interpret the influence of celestial objects upon terrestrial events through studying the positions and relative aspects of the celestial bodies. For Ṭašköprüzāde, ‘*ilm ahkām al-nujūm* is different from ‘*ilm al-nujūm*, which he uses interchangeably with ‘*ilm al-hay’a*. Accordingly, the former is applicable to the occurrences in the world of generation and corruption, which are subject to change; whereas the latter rests upon mathematical demonstrations. By just studying the ‘*ilm al-hay’a* can one acknowledge the unquestionable reality of God’s omnipotence and the validity of the following Quran verse: “Who remembers Allah while standing or sitting or [lying] on their sides and gives thought to the creation of the heavens and the earth, [saying], ‘Our Lord, You did not create this aimlessly’” (Q

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Interestingly however, among the sub-branches of the 'ilm al-hay'a/ilm al-rujūm, Taşköprüzade mentions several practices that have strong astrological implications. One sub-branch of the 'ilm al-hay'a, according to Taşköprüzade's classification, is the science of the conjunctions ('ilm al-qirānāt) that aims to understand the astrological influences of planetary conjunctions. He even refers here to several historical events such as the Noah's flood, Alexander’s rule, Chinggis Khan’s rise, or Timur’s emergence, all of which transpired at the time of the occurrence of a specific conjunction. In a similar vein, he says that the science of the zijes and the taqwīms ('ilm al-zījāt wa-taqwīm), which studies the movements of the stars to calculate the true longitudes of the stars, the ascendants, and particular celestial positions, has two specific aims. The first, central aim is to measure time and direction of the qibla. The other aim, however, is purely astrological, as this science also studies how to interpret the influences of these celestial positions upon the world of generation and corruption. He nevertheless comments upon the weakness of the scientific premises and assumptions underlying the second variant of

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64 Ibid., 347.
65 Ibid., 359: “yabḥathu fī hadhā-l-ʿilm ʿan al-ahkām al-jāriya fī hadhā-l-ʿālam bi-sabab qirān al-sabʿa kullīhā aw baʿdihā fī daraja wāḥida min burj Muʿāyyan.”

One can find a similar ambiguity in Nevʿī Efendi’s (d. 1599) overall attitude towards aḥkām. Although Nevʿī Efendi seems to denounce the astrological practice of celestial knowledge, which he defines as phantasmagorical, some of the anecdotes he recounts in the relevant passage implies that Nevʿī Efendi, who did indeed pen an astrological text, used to associate major politico-historical events as the rise of Chinggis Khan with astral configurations. See: Nevʿī Efendi, Netāʾiṣīʿ l-funūn ve mehasinīʿ l-mīṭūn, ed. Gisela Procházka-Eisl and Hülya Çelik (in collaboration with Adnan Kadić) (Harvard University, The Sources of Oriental Languages and Literatures Series, 2015), 141-147.
the science of the zijes.\(^67\)

Taşköprüzade’s skepticism did not only bear upon the invalidity and deficiencies of the scientific premises of ahkâm. He was equally critical of the strong anti-astrological camp, though he puts his criticism in a subtle way. In the specific section where he addresses the ʿilm ahkâm al-nujūm, Taşköprüzade says that many ʿālims have vehemently declared this science unlawful, whereas some others were more permissive and only denounced the belief in the idea that the stars have influence via their own independent nature. Taşköprüzade seems to have sided with the latter position, for he immediately refers here to al-Shāfiʿī, who adopted a more tolerant attitude towards astrology. As al-Shāfiʿī allegedly said, if the munajjim firmly believes that there is no effective agent in the universe except God the omnipotent, then there is no harm in dealing with astrology.\(^68\) As a counter example to al-Shāfiʿī, Taşköprüzade specifically mentions the author of the Miftāḥ dār as-saʿāda, who was none other than the famous Mamluk jurist Ibn Qayyim al-Jawziyya (d. 1350). According to Taşköprüzade, Ibn Qayyim al-Jawziyya has blown his attack on


\(^{68}\) Ibid., 312-3: “wa aʿlamu anna kathīrān min al-ʿulamāʾ ʿalā tahrīm ʿilm al-nujūm muṭlaqan, wa baʿdhum ʿalā tahṣīl mī tīqād anna al-kawākbīb muʿatthila bi-dh-dhāt, wa qad dhukiraʾ an al-Shāfiʿī rahimahallāh annahu qāla: in kāna al-munajjim yaʿtaqid anna lā muʿatthir illāllāh lakin ajrā Allāh taʿālā ʿadattahu bi-annihī yaqaʿa kadhāʾ ʿinda kadhāʾ wa-l-muʿatthir huwa Allāh fa-hadhā ʿindī lā baʿs bihi.”
astrology out of proportion.\(^{69}\)

I will further detail below the austere stance of Ibn Qayyim al-Jawziyya and his master Ibn Taymiyya (d. 1328), who seem not to have found much recognition in the fifteenth- and sixteenth-century Ottoman scholarly context. Before moving to the next section, I should note that the Avicennan model that categorizes the ‘ilm aḥkām al-nujūm as a derived natural science and the ‘ilm al-hay’a as a mathematical science was not the only paradigm adopted for classifying sciences in the post-classical period. Fakhr al-dīn Rāzī’s juxtaposition of aḥkām as an inextricable part of the mathematical sciences and his emphasis upon the utility of astrological practice were also influential upon some of the ‘ālims and classifiers of knowledge active in the Ottoman world.

In his encyclopedic work Jāmi al-‘ulūm, which is also known as Kitāb-i sittīnī as a reference to the number of sciences covered in the text, Rāzī addresses sixty different sciences from among all the available rational (‘aqūlī) and traditional (naqūlī) knowledge. In this inventory of sciences Rāzī elaborates major principles (uṣūl) of each science as well as their applications (furū').\(^{70}\) Although his collection lacks a thorough discussion of the logic of his own classification, the order and organization of the sciences listed in the work implies that in the mind of Rāzī aḥkām was intimately related to hay’a and other mathematical sciences. Unlike the Avicennan tradition where the ‘ilm aḥkām al-nujūm is categorized as one of the subdivisions of the derived natural sciences (‘ilm al-ṭabī‘iyyāt) together with dream interpretation, medicine, or

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\(^{69}\) Ibid., 313: “wa fi hadhā-l-bāb ʿaṭnaba saḥib Miftāḥ dār as-saʿāda li-annahu afrāta fī-t-ṭaʿn.”

alchemy, Rāzī categorically detaches *aḥkām* from the group of occult practices and puts it immediately after the mathematical sciences that include, in his exact order, geometry (‘*ilm al-handasa*), geodesy (‘*ilm al-masāḥa*), mechanics (‘*ilm jarr al-athqāl*), war machines (‘*ilm ālāt al-ḥurūb*), Indian arithmetic (ḥisāb al-Hind), mental calculation (‘*ilm aḥsāb al-hawāʾ), algebra (al-jabr wa l-muqābala), arithmetic (‘*ilm al-arithmāṭīqī*), magic squares (‘*ilm aʿdād al-wafq*), optics (‘*ilm al-manāẓir*), music (‘*ilm al-mūsiqī*), and ‘*ilm al-hayʾa*. In his elaboration on the ‘*ilm-i aḥkām-i nujūm*, Rāzī does not explain in detail why there is a need for mathematical knowledge in the practice of *aḥkām*, and rather goes on to explain the natures of the stars, astrological signs and houses, and the corresponding points of exaltation (sharaf) and descent (hubūt). Yet his deliberate decision to juxtapose it with the mathematical sciences, as opposed to following the Avicennan convention, is a strong indication of his acknowledgement of the *aḥkām*’s mathematical underpinnings.

The impact of Rāzī’s classification upon the scholarly preferences in the Ottoman world can be detected from the early fifteenth century onwards. For instance Muḥammad Şāh Fenārī (d. 1436), the son of the influential scholar Mollā Fenārī, wrote a detailed encyclopedic work

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71 Rāzī, 184-6. Matthew Melvin-Koushki also points out the distinguishing characteristic of Rāzī’s classification and discusses this particular text as one of the milestones of what he calls the “mathematicalization of the occult sciences in the High Persianate Tradition.” See Matthew Melvin-Koushki, “Powers of One: The Mathematicalization of the Occult Sciences in the High Persianate Tradition.” (Forthcoming in Intellectual History of the Islamicate World). I would like to thank Dr. Melvin-Koushki for allowing me to use his unpublished paper.

72 Rāzī, 184-6.

73 For the general influence of Rāzīan thought upon the scholarly life in the Ottoman lands in the fourteenth and fifteenth centuries, see Ömer Türker and Osman Demir, *İslam Düşüncesinin Dönüşüm Çağında Fahreddin er-Rāzī* (İstanbul: Klasik, 2011).
modelled upon Rāzi’s *Jāmiʿ al-alulūm*. In contrast to his predecessor and exemplar, however, in his *Anmūzaj al-alulūm* Muḥammad Ṣāh Fenārī addresses a total of hundred sciences by adding several new branches especially in the natural and mathematical sciences. One of his additions was his chapter on the ‘ilm al-ikhtiyārāt that he put immediately after the section on ‘ilm al-nujūm and right before the chapter on ‘ilm al-usṭurlāb. Intriguingly, Muḥammed Ṣāh Fenārī does not refer separately to ‘ilm aḥkām al-nujūm but discusses it within his treatment of ‘ilm al-nujūm. When one looks at the contents of the chapter on nujūm, it is clear that he gives pride of place to astrological issues such as the indications of the zodiacal signs, planets, and their exaltations as well as descents and other positions. It is also worth noting that like Rāzi, Muḥammed Ṣāh Fenārī separates astrology from other occult practices by situating it into other mathematical sciences.

The curious use of ‘ilm al-nujūm as a broader category to denote practical celestial activities including astrology also surfaces in a number of texts and treatises written in Persian in the late-fifteenth- and early-sixteenth-century Ottoman milieu. One of them is a compendium of sciences completed and presented to the reigning sultan Bāyezīd II in September 1489 by Shukrullāh Shirvānī, who was among the Persian émigré scholars/natural philosophers serving the Ottoman court at the time. In this text, entitled *Riyāḍ al-qulūb*, Shirvānī discusses eight disciplines ranging from Sufism and physiognomy to ‘ilm al-hay’a and ‘ilm al-nujūm. In his

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74 The work has yet to be prepared as a critical edition. For a brief discussion on its importance and contents, see Kemal Faruk Molla, “Mehmed Şah Fenārī’nin Enmûzecu’l-Ulûm Adlı Eserine Göre Fetih Öncesi Dönemde Osmanlı’da İlim Anlayışi ve İlim Tasnifi,” *Divan: İlim Araştırmaları* v. 10, no. 18 (2005), 245-273.

75 SK Hüsev Paşa Ms. 482, 181a-182b.

76 SK Ayasofya Ms. 4024. Other sciences include Logic (*mantiq*), Arithmetic (*ḥisāb*), Poetry (*shiʿir*), and Riddles (*muʿammā*).
presentation, ʿilm al-hayʿa is a science that studies the elements and structures of celestial as well as terrestrial bodies. The primary aim of this science is pietistic indeed, as it helps one to reflect upon and realize the wisdom of God underlying the creation of the universe. He then goes over fundamental geometrical and astronomical principles, starting from what a point, a line, or matter is. Immediately after this chapter on ʿilm al-hayʿa, Shirvānī starts explaining ʿilm al-nujūm, which, for him, is the noblest of all knowledge after the religious sciences. What Shirvānī refers to as ʿilm-i nujūm, however, is none other than astrology in the modern sense, as he clearly says that this is a science appealed to especially by rulers and sultans out of a desire for foreknowledge of celestial influences upon worldly affairs. He then explicates how to denote the degrees of zodiacal signs and planets in sexagesimal numbers. This is followed by the description of the movements of the planets and the influences of planetary aspects. He then delves into a discussion on how to calculate the horoscope of the solar revolution each year and draw astrological decrees out of the celestial positions at the designated time. Finally he elaborates the astrological significance of the lunar motions across the Zodiac and provides detailed suggestions for electional purposes. All in all, Shirvānī’s discussion in his encyclopedic work perfectly exemplifies how the practice of aḥkām al-nujūm relied upon the technical and mathematical knowledge of nujūm.

One can easily extend examples demonstrating that in the eyes of many contemporary

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77 Ibid., 39b-62a.
78 Ibid., 62b: “ba’d az ʿulūm-i dīnī hīch ʿilm a lā az ʿilm-i nujūm nīst...va muḥtāj ilayhi mulūk va salāṭīn-ast chūn bi-vāsiṭa-i taʿṣīr-i qirānāt va kusūfāt va sāʾir ḥālāt-i kavākib dar ʿālam-i kavn va fasād vaqāyī’ va zalāzl va ṭūfānāt va muḥārabāt va qaḥt va vaḥā va amṣāl-i ʿān vāqī’ mī-shavad. Agar kasāʾ īn ʿilm rā dānād va ān ḥālāt ra dar yābād va rī āyat namāyad umīd ki az āfāt sālim mānād.”
79 Ibid., 62b-80b.
astral experts and natural philosophers *ahkām* of the stars essentially entailed the scientific knowledge of *nujūm* and that the broader category of ‘ilm al-nujūm naturally paved the way to astrological preoccupations.\(^80\) For example, one of Rūkn al-Dīn ʿĀmulī’s students, Khiṭābī *munajjim*, who arrived at the Ottoman lands in the late 1470s wrote—as his first piece to present an Ottoman prince—a philosophical treatise entitled *Jāmiʿ al-qismayn*.\(^81\) As the title implies, Khiṭābī reviewed in this work the two specific branches of speculative philosophy: *ḥikmat-i*

\(^80\) In his *al-Zij al-mujmal*, for instance, Mevlânâ Küçük introduces ‘ilm al-nujūm as one of the three most exalted sciences next to the ‘ilm al-hay’a and the revealed sciences (‘ilm al-sharāyi’). For him, astrological tasks are among the constituent bodies of this ‘ilm. See TSMK R. 1713, 2b-11a. In a similar vein, Mirīm Çelebi, about whom more information will be provided in the third chapter, says in his commentary on the Ulugh Beg tables that the noblest of all mathematical sciences is ‘ilm-i nujūm. By attaining the honor of this knowledge can one understand the nature of the movements of the stars, their positions, and their stations on each and every one of the astrological signs, and calculate five daily prayers, azimuth of the qibla, and other directions. See SK Ayasofya Ms. 2697, 2a: “*shariftarīn nav’i az anvā’-i riyyāzī ‘ilm-i nujūm-ast ki nafs-i insānī rā az iqtińāh-i ān sharaf itṭilā’ bar māhiyat-i ḥarakāt-i kavākhīb dar ṭāl va ‘arz va kayfiyat-i avzā’ ve maqāmāt-i har yak dar burūj va nītaqāt va ma rifāt-ī avqāt-i ʿalavāt va samit-i qibla va sāʿ-ī jihat hāsil mī shavad.” Another contemporary astral expert, Efezade, says in his commentary of Ṭūsī’s treatise on the uses of astrolabe (*Risāla bīst bāb fi ma rifāt-ī usṭurlāb*) that the importance of ‘ilm-i nujūm derives from its pietistic, astronomical, and astrological purposes. For him, the primary operations one can carry out with the astrolabe include calculations of important parameters such as the true longitudes of the planets (taqvīm-i kavākhīb) and the ascendants of the hours (*javālī*). See SK Ayasofya Ms. 2641, 2b-3a: “*hikmat-ī āfarīnash-ī aflāk va anjum ve ārāstān-i yāqī-ī haft va hashtom ān-ast ki ... sabab-ī nizām-ī ʿalam ve intizām-ūmūr-i bānī ādam bāshad va ū rā vājīb-ast ki baʾd az ma rifāt-ī vājib l-vujūd nazar konad baʾīn kunbad-i kubūd ki ... vaqt-ī vujūd va nūhūs va suʿūd dar ikhṭiyār-ī amr-i mardūd ve maḥmūd va dar šalāh-ī aʿmāl va fašāh-ī ahvāl-ī khod avqāt-ī sharīa va sāʾt-ī laṭṭaʿa guzin konad tā hama kārhar-ī yi dunyāvī va ukhrāvī bar mūjāb-ī hikmat-ī ʿamalī bāshad va az ṣāliha-ī khod bahramand va savadmand bovad va ān jumla bi-ʿulūm-ī riyyāzī hāsil-ast ki usūl-i īʿilm-ī hayʾat va handasa va ḥisāb-ast va muqarrar-ast ki ʿamara-i īn ʿulūm baʾd az ṣāliha bi-maʿrifatīlāh ʿilm bi-samit-i qibla va avyām va ma rifāt-ī avqāt va shuḥūr va aʾvām-ast va inhā navqūf-ast bi-maʿ rifāt-ī raṣad-ī sitārāgān va sāʾt va maṭāl-ī va istikhrāj-ī taqvīm-ī kavākhīb va javālī.”

\(^81\) Ayasofya Ms. 2414M, 19b-20a: “*muḥarrir-ī in suṭūr va muqarrir-ī in mazbūr...Ḥusām b. Shams al-dīn al-ḥaṭīb al-muṣṭahīr bi-Khiṭābī al-Gīlānī...ʿijdāl al-vaqt rā dar taʾrīkh-ī sana 884 hijriyya dar baldat al-muwahhidīn-ī Ṭokat...bi-hās-ī vasīla-i idrāʾ-ī saʾādat-i taqqabbul-i turāb-ī siddi-ʾa-ʾi pādishāh va pādishāhzāda-ī ....sultān abūʾl-muẓaffar Bāyezīd...taʾlīf kard.”
riyāḍī (mathematical sciences) and ḥikmat-i ẓabī‘i (natural sciences). More precisely, he first elaborated ‘ilm-i nujūm, and like Shukrullāh Shirvānī, delved solely into an astrological discussion, laying out the qualities and indications of the twelve astrological houses. For him, ’ilm-i nujūm, which is more exalted and prestigious than ‘ilm-i ẓibb, is useful, divine knowledge that helps human beings understand the impact of the motions of the celestial objects on the sublunary world, guard themselves against harm and destruction—as ordered in the Quran—and learn about divine decrees upon their personal lives.\(^8\)

One last striking example that seems to have followed Rāzī’s classification and discusses nujūm, including the aḥkām, as part of the mathematical sciences is the unique catalogue of the Ottoman palace library prepared in 909/1502-3 by the chief librarian of the time, Ḥātūfī (d. 1541). In this voluminous inventory, Ḥātūfī, a noted physician and learned natural philosopher, recorded approximately 7,200 titles in 5,700 volumes, grouping them in different clusters of disciplines. The inventory starts with copies of Quran, followed by Quranic exegesis (tafsīr) and recitation (qira‘at), Hadith, Principles of Religion and Theology (uṣūl al-dīn, kalām), Jurisprudence (uṣūl al-fiqh, fiqh), Sufism (tasawwuf), Medicine (īʿb), History and Political Thought, Poetry, Grammar and related Linguistic Sciences, Occult Practices, Mathematical Sciences, Philosophy, and other Revealed Books. Interesting for our purposes here, Ḥātūfī’s gallery on the occult sciences, which includes oneiromancy, physiognomy, alchemy, geomancy, divination, talismans, lettrism, and magic does not have a single reference to an aḥkām text,

\(^{8}\) Ibid., 23b: ‘fāida [-i ‘ilm-i nujūm]: har chand az taqār va qadā ‘imkān-i ĥurūj nīst amma bi-

mu ‘addā ‘wa lā tulgū bi-a’y dikum ilā ‘t-tahluka’ va sharr ihtirāz vājib-ast va bi-qadr-i vas’ sa ‘y lāzim cha faḥvā-yi ‘laysa li’l-insān illā mā sa ‘y rā ishārat hamīn-ast va īn ma ‘nā bi-sūrat

nayyād illā az idrāk-i natāyij-ī harakāt-i a’rām-ī samāvi ya’ni sayr-ī a’rām-ī mustanīra dar

aqṣām-i a’ṣām-ī mustadīra va ān duvāzdah dar duvāzdah-āst ki az ʿuvār-i zāyijāt-ī ṭāvālī’

makhṣūṣ mī-shavad ki īn ma ‘nā ra iṣṭilāḥ-ī ahl-ī shar ‘ṣūrat-ī taqār khānand.”
because 'Ātūfī deliberately collects those titles on celestial knowledge, including strictly astrological ones, under the rubric of mathematical sciences, which contains ‘ilm al-nujūm, ‘ilm al-hay’a, ‘ilm al-ḥisāb, ‘ilm al-handasa, ‘ilm al-mūsīqī, and ‘ilm al-shataranj.⁸³

‘Ātūfī’s clarity vis-à-vis the complicated status of astrology, which, as we have already seen so far, constantly oscillates between the natural or occult sciences (al-‘ulūm al-ṭabī‘īyya) and the mathematical sciences (al-‘ulūm al-riyādīyya) finds its most evident expression in his deliberate decision to situate Fakhr al-Dīn Rāzī’s book on celestial magic, al-Sīr r al-makṭūm fī mukhāṭbat al-nujūm, among the titles in the natural/occult sciences while listing the same author’s work on electional astrology, Ikhtiyārāt al-aḥkām al-‘alā‘iyya min al-‘ālam al-samā‘wiyya, under the rubric of astral and mathematical sciences. I believe these two works provide a convenient gateway to move into the next and final section of this chapter, where I will talk about the attacks addressed toward astrology in view of its epistemological invalidity and religious impermissibility.⁸⁴ In this section I will not only mention the major arguments arrayed against the practice of astrology but also highlight the urgency of the need to distinguish the

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⁸³ Library of the Hungarian Academy of Sciences, Ms. Török F 59, 313.
⁸⁴ While there was no question about the authenticity of Rāzī’s authorship as regards to the Ikhtiyārāt al-aḥkām al-‘alā‘iyya, the other work on celestial magic, al-Sīr r al-makṭūm, was doubted for a long time as an authentic work of Rāzī. But thanks especially to the studies of Živa Vesel, it is no longer open to doubt. See: Živa Vesel, “The Persian Translation of Fakhr al-Dīn Rāzī’s al-Sīr r al-makṭūm (‘The Occult Secret’) for Ilutmish,” in Confluence of Cultures: French Contributions to Indo-Persian Studies, ed. Françoise ‘Nalini’ Delvoye (New Delhi and Tehran: Manohar, Centre for Human Sciences, and Institut Français de Recherche en Iran, 1995), 14-22; idem., “Le Sir r al-Makṭūm de Fakhr al-Dīn Rāzī (m. 606H/1210) face à la Ghāyat al-Ḥakīm,” in Images et Magie: Picatrix entre Orient et Occident, ed. Jean-Patrice Boudet, Anna Caiozzo, and Nicolas Weill-Parot (Paris: Honoré Champion Éditeur, 2011), 77-93. Ayman Shihadeh also confirms that since there are references to the al-Sīr r al-makṭūm in at least three different works of Rāzī, there is no question that the text belongs to him, though he apparently wrote it at a relatively early stage of his career. See Ayman Shihadeh, The Teleological Ethics of Fakhr al-Dīn Rāzī (Leiden: Brill, 2006), 8, fn. 22.
I. 4. Polemics Against Astrology and Astrologers

Aside from categorizing ‘ilm aḥkām al-nujūm as part of the mathematical sciences – unlike the more conventional Avicennan tradition– Rāzī is important for having composed individual treatises on electional astrology and celestial magic, in which he devoted his efforts to prove the utility and validity of studying celestial objects for astrological purposes. In his Ikhtiyārāt al-aḥkām al-ʿalāʾiyya min al-ʿālam al-samāwiyya, a popular textbook on electional astrology dedicated to Kharazmian ruler ʿAlā al-Dīn Tekish (r. 1172-1200), Rāzī discusses in two main parts (maqālāt) the general theoretical considerations (dar kulliyāt) and detailed practical applications (dar juzʿiyyāt) of electional astrology. In the first part, he specifically addresses the arguments raised by the opponents of astrology who consider ikhtiyārāt a futile and irreligious endeavor. According to these people, ikhtiyārāt bears no utility, because, among many other reasons, it is not possible to divert a divine decree. Moreover, the Prophet Muhammad averred that whoever believes in the stars falls into unbelief (kufr). Had the belief in the stars been righteous, the practice of astrology would not have been unbelief.

Rāzī refuted the first argument by alluding to a discussion on the free will of individuals. As he maintained, each and every thing God created in this world is the cause of something else. For instance, eating brings satiation, medicine balances bodily humors, worship secures eternal

salvation, and disobedience invokes punishment. We, as human beings, are not capable of avoiding the divine decree, but to say that we should abandon electing moments is akin to saying we should stop eating bread, drinking water, or obeying God’s rules. Because according to the opponents’ argument, if I was born a lucky person by divine decree, then I cannot turn to an ill-fated individual regardless of my obeying God’s orders or not. Such a statement, however, is far from being rational and religious, and thus a corrupt (bāṭil) one.87

As for the second argument, Rāzī said that believing in (the existence of) the stars entails believing in the existence of the Creator. This is not unbelief (kufr); on the contrary it is even a higher degree of belief in the living, most intelligent, omnipotent, and eternal God.88 For Rāzī, the study of the heavens varies with respect to the goals and scope of the activity conducted. Foremost is the contemplative study of the stars as signs of God’s wisdom and limitless power. Second is its practical use to measure time and direction for religious purposes such as calculating the time of the five daily prayers, the first day of each month, or the direction of the qibla. For Rāzī, like Ibn al-Akũfānī, these two types of celestial activity are compulsory (vājib). The loosely-defined third type of celestial enterprise is examination of the amount, sizes, and rotations of heavenly objects for a mixture of scientific and pietistic purposes. The fourth activity

87 Ibid., 8b-9a: “Hargiz daf‘-i taqdir-i ilāhī maqdir-i bashar nīst va likin īzad taʿālā har chizī rā sabab-i chīzī digar nihāda ast. Chunān ki nān khordan rā sabab-i sīrī karda ast va dārū khordan rā sabab-i zāʾ il kardan-i khalthā karda va ʿibādat kardan rā sabab-i najāt karda va maʿsiyat rā sabab-i ʿiqāb karda. Pas az ān ki mā taqdir-i khodā rā man ʿnātavānām kardan lāzim āyad ki bi-tark-i ikhtiyār bagīyām bāyād ki bi-tark-i nān vā āb khordan bagīyām va bi-tark-i jāʿat kardan va farman bardārī bi-jāy āvordan bagīyām va gūyīm ki agar taqdir-i khodā taʿālā chunān ast ki man az nik-bakhtān bāshām bad-bakht nashovam, agar jāʿat konam va agar nakonam. Pas hammunān ki ān sukhan az ʿaql va sharʿ dūr ast, suʿāl-i sāʾ il hammunān bāṭil ast.”
88 Ibid., 9a: “[A]gar kāsī īmān āword ba-nuǰūm az ān jihāt ki ēshān dalīl ast bar hastī-i afārīdūr-kāh āyī va ἀlim va qādir va qadīm. Īn kufr nabovad balkī ʿayn-i īmān bovd balkī ʿallītār daraja-i bovad dar īmān.”
is tracking the influences of celestial phenomena upon the terrestrial realm by essentially acknowledging that these influences occur not by the nature of the stars but solely by the divine power. This is, for Rāzī, neither unbelief nor an error. The fifth pursuit is arguing that the stars affect terrestrial events through their own independent nature. According to Rāzī, such an argument is a mistake _per se_ but does not stand as an example of _kufr_. Finally, the sixth type clearly corresponds to unbelief: arguing that the stars are the real generators of the things (_mudabbirāt_ ) in the universe and that astral worship is obligatory upon human beings. 89 Therefore for Rāzī, and in fact for other seemingly tolerant figures including al-Shāfi’ī, al-Akfānī, or ašrāṭāfriẕāde, the study of heavens may lead one either to piety or unbelief depending on the purposes and scope of the celestial activities one undertakes. 90

Rāzī also emphasizes the experiential and conjectural nature of astrological practice in his works on philosophical theology ( _al-Maṭālib al-ʿāliyya_ ) and celestial magic ( _al-Sirr al-maktūm fi mukhāṭabat al-nujūm_ ). As he puts it forward, no truly erudite _munajjim_ claims to attain absolute


90 _Ibid._ , 10a: “ _Pas maʿlūm shod ki īmān bi-nujūm kay īmān bovad va kay kufr bovad._ ”
knowledge about the future, for they all know that their craft could only allow them to propose plausible conjectures. Ultimately everything lies subject to the will and power of the God, and the celestial objects operate not as the active efficient causes (fāʾil-i mukhtar) but rather as the intermediaries between God and sublunary events. Astrology is only forbidden when astral determinism that ascribes independent power to celestial objects is in question.91

Despite such careful remarks of Rāzī and many other genuine astral experts with respect to the limits and true nature of astral causality, the risk of undermining the idea of God’s omnipotence and sharʿī traditions was alarming to the opponents of astrology. This potential danger pushed many jurists and scholars to frown upon the practice of astrology, notwithstanding the fact that they never denied the fundamental causality between celestial phenomena and terrestrial matters. As Lynn Thorndike, one of the pioneer scholars of the history of magic and astrology, had aptly said long ago, before the gradual acceptance of Isaac Newton’s Principia Mathematica beginning in the eighteenth century, the universal law of nature was indeed astrological, as the idea of correlation between terrestrial events and celestial configurations was widely accepted.92 Even the staunchest opponents of astrology in the medieval and early-modern context did not question this cosmological assumption.

When we look at the writings of the most ardent opponents of astrology in medieval Islamicate culture, such as Ibn Sīnā, Ghazālī, Ibn Taymiyya, Ibn Qayyim al-Jawziyya, or Ibn Khaldūn, it appears clear that none of them in fact denied the unbroken chain of causation

flowing from God through the celestial bodies to the terrestrial realm. Ibn Sīnā, for example, accepted the general astrological assumption that the events in the sublunary world are determined by celestial causes. He rejected the hyperbolic claims of munajjims to fully understand the dynamics underlying this causality and to predict future events, because for Ibn Sīnā the humans are simply incapable of tracking the innumerable causes. In his Iḥyāʾ al-ʿulūm, Ghazālī also mentioned the link between the occurrence of terrestrial events and the effects of intermediary causes in the celestial realm. Despite the fact that in the first book of the Iḥyāʾ he labeled the astrological craft as a useless and blameworthy science, for Ghazālī, only the ignorant who have “no glimmer of the marvels of God’s creation and the scope of His power” would reject the causal connection. As he later wrote in the thirty-second book of the Iḥyāʾ, those people who know God’s actions ought to be aware that the planets are subject to God’s command: “The conviction that the stars are causes that have effects…by the creation of God is not damaging to religion but it is truth.” In a similar fashion, in one of his fatwas where he vehemently derided the practice of astrology, Ibn Taymiyya clearly acknowledged that “[the stars] have an influence, that which is known by the senses and by these other affairs, this is true.” Moreover, Ibn Khaldūn also admitted the theoretical as well as practical possibility of celestial influence upon terrestrial events, explicitly remarking in his discussion on prophecy and

94 Frank Griffel, Al-Ghazālī’s Philosophical Theology (New York: Oxford University Press, 2009), 243-4.
divination that celestial positions (waḍʿ falaki) play a role in the appearance of prophets.96

What were, then, the major issues at stake that compelled several men of knowledge to denounce the craft? What kind of arguments did opponents raise for refuting astrological claims?

The arguments to which opponents of astrology appealed make many different claims, ranging from the social problems potentially caused by the belief in astrology to the methodological and epistemological issues inherent in the science of astrology. At the centre of these arguments, however, lays the essential charge of associating the practitioners of the craft with astral determinism. In these counterarguments, the munajjims are often relegated to the status of magicians and street diviners, who are accused of endowing celestial objects with independent creative powers. Simultaneously, the learned practice of astrology is easily stripped of its mathematical/astronomical garb and presented as a naïve and simplistic species of magic.

In terms of the potential social problems the belief in astrology might engender, the opponents of astrological practice referred to the detrimental consequences of false expectations caused by munajjims’ predictions and the damaging of moral and religious values. For example, Ibn Khaldūn wrote that astrological predictions often pave the way for expectations of a political crisis in a dynasty. This inevitably encourages the rivals and enemies of the reigning dynasty to revolt against it. Ibn Khaldūn further added, without providing any specific example, that he had personally observed many incidents of this sort.97 As regards to moral issues, Ibn Taymiyya alluded, in one of his fatwas, to the problems caused by women’s frequenting the diviners’ shops and sitting close to young men, who were present there with the sole intention of approaching

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those women.\textsuperscript{98} Apart from these two issues, the opponents were annoyed by the fact that in their search for divine support, society in general, and the ruling elites in particular, depended more on astrologers than the ‘ulamā’. As Ibn Qayyim al-Jawziyya made it explicit in his \textit{Miftāh dār al-saʿāda}, munajjims were encroaching “the sphere of human activity wherein should predominate the authority of the ‘ulamā’.”\textsuperscript{99}

Aside from these potential social problems, the opponents of astrological practice also frequently referred to the limits of the scientific premises of astrology. It is quite interesting that the arguments raised by the opponents with respect to the weak scientific methods of astrology parallel the critical self-reflections of munajjims about their own craft, which I already discussed above. The famous opponents of astrology like Ibn Khaldūn or Ibn Qayyim al-Jawziyya often emphasized the conjectural (\textit{takhmīnī}) nature of astrological practice in view of the impossibility of knowing and observing all the effective celestial causes upon the terrestrial realm. Ibn Qayyim al-Jawziyya specifically pointed out the \textit{zīj} literature and rhetorically asked how a munajjim could know which table to trust when \textit{zījes} differed significantly in the values they provided about the positions of the planets.\textsuperscript{100} For Ibn Khaldūn, due to the difficulty of obtaining thorough celestial information and additional problems related to the instruction of astrology, such as the scarcity of erudite masters, one should not waste his/her time learning astrology, which is already

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98 Yahya J. Michot, “Ibn Taymiyya on Astrology: Annotated Translation of Three Fatwas,” 188. Similar argument was also raised in some examples of the Medieval \textit{hisba} manuals that aimed at inspecting the market transactions. See: George Saliba, “The Role of the Astrologer in Medieval Islamic Society,” 61.


100 Ibid., 602.
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a very complicated subject with numerous branches and subcategories.\textsuperscript{101}

Another sub-theme frequently visited by the opponents of astrology is the claim regarding the prophetic nature of celestial knowledge. It is not uncommon to see munajjims attributing their craft to the prophet Idrīs, who was often identified as Hermes Trismegistus and/or Biblical Enoch.\textsuperscript{102} The Ottoman astrological materials, especially those composed prior to the last quarter of the fifteenth century, also often mention Idrīs as the discoverer of the secret knowledge of the stars.\textsuperscript{103} The leading opponents of astrology, however, energetically criticized this argument. Ibn Khaldūn, for example, stated that despite the common views of some weak-minded people, the knowledge of celestial powers and influences were not revealed.\textsuperscript{104} Ibn Taymiyya also treated this issue separately in one of his long fatwas. As he put it forward, there

\textsuperscript{101} Ibn Khaldūn, \textit{The Muqaddimah} v. 3, 265. Ghazālī also thinks that spending years studying astrology is wasting one’s lifetime in vain. See: Carlo Nallino, “Astrologia e astronomia presso i Musulmani,” in \textit{Raccolta di scritti editi e inediti}, v. 5, Astrologia, astronomia, geografia, ed. Maria Nallino (Rome: Istituto per l’Oriente, 1944), 33.


\textsuperscript{103} In the historical chronology sections of the earliest taqwīms, the date the science of the stars was revealed to Idrīs is particularly specified: “nuzūl-i īlm-i nujūm ba-Idris” or “Īdrīs peygāmbere gökden nūcūm ineli.” The latest taqwīm in which I was able to find a substantial reference to Idrīs is the Arabic almanac of the year 983 now preserved as BnF Arabe Ms. 2570. There (20a) Idrīs is defined as the “kāshifu īlm al-nujūm wa-l-aḥkām.” Some of the contemporary astrological textbooks written in plain Turkish also refer to him whenever the author felt the need to justify the validity of astrology, and thus underline the prophetic value of this science. For example a late-fifteenth century astral expert named Nūcūmī wrote a simple astrological textbook that he dedicated to Prince Cem around the late 1460s or early 1470s. In this text entitled \textit{Mezzāku’l-ussāk fi īlm-i l-āfāk}, in addition to widely adopting Fakhr al-Dīn Rāzī’s arguments in favor of the astrological practice, the author discusses at length the significance of Idrīs for the cultivation of astrological knowledge and says that the science of the stars is a miracle bestowed upon him. See Kandilli Ms. 372, 63b: “Bu īlm-i şerif hod ma lümduk ki Idrīs nebi ‘alehisselâm hażretinüñ īlm-i mu’cizesidür, hač te’ālā ... ānā īlm-i nücūmda otuz şuhif gördümişidür ve ba’zı hukemâ dirler ki otuz şuhüfuñ oni īlm-i şerî’at idi ve oni īlm-i nücūm ve oni gayr-i ulũmda idi.”

\textsuperscript{104} Ibn Khaldūn, \textit{The Muqaddimah} v. 3, 262-3.
is no authentic tradition about the revelation of the science of the stars to Idrīs. Moreover, even if some part of this science was taken from a Prophet, it now contains more lies and vain elements. Finally, he refers to the standard two-tiered division of the science of the stars—i.e., the one depending on computation (ḥisāb) and the other on (astrological) judgments (aḥkām)—and states that the second belongs to the field of magic. Since it is impossible for any of the Prophets to have been a magician, then there is no way, according to Ibn Taymiyya, this science was revealed to the prophet Idrīs.\footnote{Michot, “Ibn Taymiyya on Astrology: Annotated Translation of Three Fatwas,” 170-175.}

As is evident from this brief discussion of the prophetic roots of astrology, while munajjims might have at times resorted to the strategy of tracing their controversial craft back to the prophet Idrīs, the opponents of astrology often turned to the key strategy of identifying ʿilm aḥkām al-nujūm as a sort of applied magic, which they thought asserted astral determinism and thus undermined the fundamental pillars of Islamic faith. In almost all textual examples where jurists, theologians, and other Shariah-minded scholars attacked astrology, this deliberate maneuver comes to the fore, associating ʿilm aḥkām al-nujūm with astral determinism and the munajjim with a magician or diviner. Ibn Taymiyya’s relevant fatwas, for instance, are filled with remarks where the Hanbali jurist declares those who are keenly interested in astrological practice as unbelievers. For Ibn Taymiyya, whoever believes that planets and other celestial objects administer the destiny of individuals, and whoever seeks the aid of celestial power through invocation, is a corrupt associationist (mushrik).\footnote{Ibid., esp. 160-170.} Ibn Qayyim al-Jawziyya also spilled much ink to charge different kinds and levels of astrological activity with astral determinism and hence unbelief. For Ibn Qayyim al-Jawziyya, munajjims lay claim to God’s omnipotence, and
therefore deserve such harsh treatments as severing their hands from their arms and tearing their “lying tongues” from their mouths so that they could no longer “trade on the gullibility of the umma.”

It is quite intriguing that despite such severe charges of astral determinism, munajjims always refrained in their writings from implying any sense of astral determinism. On the contrary, they often subsumed celestial influences under the will of God and emphasized the fact that the entire cosmic order was in the full control of the divine power. One can easily see in the Ottoman astrological corpus of the fifteenth and sixteenth centuries that when expressing their astrological predictions, munajjims inserted at regular intervals such clauses, provisions, and Quranic verses as “bi-idhnillāh” [with the permission of God], “Allāhu a’lam” [God is the most knowing one], “‘indahu mafātih al-ghayb” [with Him are the keys of the unseen], “lā ya’lamu al-ghayb illallāh” [No one knows the unseen except God], “Mā shā’allāh kāna wa-mā lam yashā’ lam yakun” [Whatever Allah willed to be, shall be, and whatever Allah did not will to be, shall not be]. While one may interpret the insertion of these remarks as a simple trick to escape the charge of infidelity, what seems more plausible though, on the basis of the previous discussion with respect to the munajjim’s critical self-reflections, is that for many munajjims astral determinism was in fact almost never an issue. Rather, they genuinely and deliberately

108 One exception may be Abū Maʿshar, the most famous astrologer in all of Islamic history, who was an ardent proponent of astral determinism, although he also employed in some of his writings the same alibi of God’s omnipotence. As an indication of his belief in astral determinism and his tendency to assign anthropomorphic qualities to the heavenly bodies, Abū Maʿshar defines astrology in his Kitāb al-milal wa-d-duwal as the science of interpreting the indications of the “celestial” or “rational” personalities” (al-ashkhās al-ʿulwiyya or sometimes al-ashkhās al-ʿaqliyya), not as the craft of interpreting the influences of the celestial bodies (al-ajrām al-ʿulwiyya). See Abū Maʿshar on Historical Astrology: The Book of Religions and
made the celestial effects subsidiary to God’s unlimited power.

Although the views quoted here originate almost solely from the austere Hanbali jurists, and may thus seem not representative of the entire cultural and intellectual spectrum, a closer examination of other well-known names who were either integral members of or influential upon the fifteenth- and sixteenth-century Ottoman scholarly context also reveals similar patterns.

One of these names is Sayyid Sharīf-i Jurjānī (d. 1413), who was profoundly influential on the development of the Ottoman higher education curricula through the dissemination of his works in the fields of grammar, jurisprudence, and especially kalām.\(^{109}\) His magnum opus in the field of kalām entitled Sharḥ al-Mawāqif, a massive commentary on his master ‘Aḍūd al-Dīn al-Ījī’s (d. ca 1355) relatively short tract on theology, became a key text upon which numerous commentaries and super-commentaries were written by the Ottoman ‘ulamā’ in the fifteenth and sixteenth centuries.\(^{110}\) In one part of his lengthy commentary, Jurjānī specifically takes the case of munajjims. For Jurjānī, munajjims constitute a group that denies the omnipotence of God. As he maintains, munajjims believe that stars rule the terrestrial events by means of their positions in the Zodiac or the planetary aspects among one another. He refers here to the key concept “mudabbir” and associates munajjims with the belief that celestial objects act and rule

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independently.111 While targeting these alleged claims of munajjims, Jurjānī resorts to one of the most common arguments used in the polemical literature as to the disparate fates of twins. Accordingly, Jurjānī questions how it could be possible for the twins to have different courses of life while they are born at the same time, and thus have apparently the same ascendant. Jurjānī concludes that contrary to what the munajjims strongly hold, a minor change in the configuration of celestial positions does not have any substantial impact on terrestrial events.112

Curiously enough, Jurjānī’s critical remarks on the practice of munajjims did not go unchallenged in the early-sixteenth century Ottoman scholarly circles. Mü‘eyyedzâde ‘Abd al-Rahmân (d. 1516), who was one of the key “scholar-bureaucrats” of the time, wrote a brief super-commentary on Jurjānī’s text in which he heavily criticized the stance of his intellectual predecessor vis-à-vis the real scope of the practice of astrology.113

Mü‘eyyedzâde’s significance in the sixteenth century Ottoman scholarly establishment can in fact be hardly exaggerated. He was an integral part of the immediate intellectual circle of Bâyezîd II from the latter’s governorate years in Amasya on. His influence upon the prince, and their debauchery and orgies of drug use in Amasya irritated Sultan Meḥmed II, who eventually

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113 I borrowed this term “scholar-bureaucrat” from Abdurrahman Atçıl’s study on the formation of the Ottoman scholarly establishment in the fifteenth and sixteenth centuries. See: Abdurrahman Atçıl, “The Formation of the Ottoman Learned Class and Legal Scholarship, 1300-1600.” (Ph.D. Dissertation, The University of Chicago, 2010).
decided to take measures and send his own men to Amasya to execute all the mischievous people surrounding the young prince. With the help of Bāyezīd, Mū`eyyedzâde first escaped to Aleppo, and then went to Shiraz where he studied for a few years with the luminary scholar Jalāl al-Dīn Dawānī (d. 1502). Upon hearing the death of Meḥmed II and the subsequent enthronement of his benefactor Bāyezīd II, he returned back to the Ottoman lands with an ijāza he secured from Dawānī.114 After holding a few teaching and administrative positions in Istanbul and Edirne, he was first promoted to professorship at one of the Saḥn madrasas, which was later followed by his promotion to chief military judgeships of Anatolia and Rumelia. During his eight-year tenure as a mudarris at the Saḥn, and his even longer administrative service as the military judge (qāḍī al-`askar) of Anatolia and then of Rumelia, Mū`eyyedzâde had the opportunity to teach new generations of scholars and administer appointments in the scholarly bureaucracy.115 There are a number of extant archival documents from early to mid-sixteenth century, enlisting plenty of scholars as the mülâzım of Mū`eyyedzâde.116 As such, they manifest that Mū`eyyedzâde shaped the formation and functioning pf the Ottoman scholarly hierarchy of


116 TSMA E. 5375; TSMA E. 5605; TSMA E. 9555; TSMA E. 9802; TSMA E. 10053. In all these short registers recording the mudarris appointments in the early sixteenth century, there is detailed information about the students and mülâzims of Mū`eyyedzâde that include such names as Muḥammed Çelebi b. Müftî `Alî, Kireççizâde Aḥmed, Mevlâna Süleymân, Maḥmūd Çelebi, Mevlâna Muḥammed Çelebi, Mevlâna Dâvud or Mevlâna `Acem Muḥyiddîn, all of which seem to have held teaching offices throughout their career either in one of the Saḥn madrasas or other high-ranking teaching institutions.
the time.

Due mostly to his busy administrative schedule, he was not prolific as a writer and his entire oeuvre consists only of his fatwas along with a few separate theological tracts. In one of these tracts, al-Hawāshī 'alā Sharḥ al-Mawāqif, which he presented to Bāyezīd II sometime between 1480s and 1502, Mū‘eyyedzāde challenges the arguments proposed by Jurjānī against the claims of munajjims. Mū‘eyyedzāde first starts with reminding that in none of the astrological texts (kutub al-tanjīm) could one find a single remark stating the celestial bodies are the single, efficient causes (al-fāʾil) of the terrestrial events. All nujūm books rather say, according to Mū‘eyyedzāde, that just like chilling is the natural sequence of drinking water or eating scammony (saqmūniyā) helps digesting, the celestial phenomena prepare the necessary conditions for the subsequent occurrence of the influence. As Mū‘eyyedzāde underlines, even the most pious people do no deny this interdependence of celestial and terrestrial phenomena. In fact the entire cosmic configuration is yet another sign of God’s wisdom and knowledge, and its denial makes an individual an unrighteous person.117

Having laid out the general principles about the cosmological underpinnings of the astrological practice in the introduction to his critique, Mū‘eyyedzāde treats particular arguments of Jurjānī. As regards to the question of the dissimilar fates of twins. Mū‘eyyedzāde says that

what really matters in the astrological interpretation is not the time of birth but rather the time of conception (misqat al-nutfa). For Mu‘eyyedzade, all the authoritative sources, which he unfortunately did not specify within the text itself, agree upon this fundamental principle. Moreover, for Mu‘eyyedzade, Jurjani’s statement as to the insignificance of the minor differences in celestial degrees in terms of the overall outcome of events in the terrestrial world falls far from reality. He exemplifies a hypothetical situation in which one’s ascendant is located in the last degree of a particular astrological sign, whereas the ascendant of other is in the first degree of the next sign. In that case, Mu‘eyyedzade argues, all the concomitant variables such as the owner of the triplicity (muthallatha), terms (ḥadd), decans (wajh), some of the prorogators including the haylāj and kadkhudāh, the ruling planet of the ascendant (al-mustawlī ‘alā al-tāli‘), the cardines (awtād), the cusps of the astrological houses, and relevant issues that one should take into consideration for astrological interpretation will be entirely different.118 Mu‘eyyedzade even insults Jurjani in a pedantic manner for his ignorance in this branch of knowledge, as he says that Jurjani improperly uses some of the key astrological concepts such as the exaltation and descension of zodiac signs.119

What we have here is, thus, a valuable example of a learned Ottoman ‘ālim conversant in


astrological lore to the extent of criticizing some of the stellar names of Islamic philosophy and theology on account of their objections against the astrological practice. As we will see in more detail in the next chapter, Mū’eyyedzāde’s rich library was replete with almost all the canonical works of Islamic astrological and astronomical tradition. There is definitely a need for further research to explore the curricular and extra-curricular activities of some of Mū’eyyedzāde’s students in order to better evaluate the extent of the interest of madrasa-affiliated scholars in astrological pursuits. Although Mū’eyyedzāde’s prominent status in the late-fifteenth and early-sixteenth century Ottoman intellectual context enables one to argue that his positive attitude toward the practice of astrology represents the general attitude of scholars at the time, there were other figures that were highly sceptical about the assertions of the munajjims.

One of these names is Sinān Paşa (d. 1486), a noted scholar and grand vizier who owed much of his fame to his prose and verse writings in Turkish.¹²⁰ Early his career, Sinān Paşa gained prominence as an erudite mathematician but toward the end of his life he decided to turn towards the Sufi path. After his initiation to the Sufi way, he wrote in ornamental Turkish three different works on Sufism and ethics. One of these texts is Maʾārifnāme, a work on ethics in which Sinān Paşa wove together several issues important for helping an individual to conduct a pious life in both this world and Hereafter. He devoted one particular section of this work to the elaboration of the controversial status of munajjims and physicians (işāretu hāli ’l-mūneccim ve ’t-ṭabīb).¹²¹ The central argument in this relatively long passage is that in order to be an upright

Muslim one should not pay attention to the words of munajjims—nor physicians. God is the only healer and source of wisdom; the supplication should be addressed solely to Him.

For Sinān Paşa, most munajjims are fools to dare claim to know the unseen (ghayb), because the ability to know the unseen is a divine gift not granted to ordinary people. According to Sinān Paşa, the majority of munajjims worship celestial powers (‘abede-i ṭab’) and keenly observe astral bodies (harāse-i kevākib-i seb’a). They fail to understand, however, the influences caused by the (positions of the) stars. Sometimes munajjims draw a judgment based upon a particular celestial position, but another configuration immediately renders its effect void. Sometimes munajjims interpret a particular planetary aspect as an auspicious sign but it ultimately turns out to be disastrous. For him, those who are straight in manner and sound in piety do not ever need a zīj or taqwīm. Yet, as he underlines, this does not mean that pious people deny the existence of celestial phenomena and their influence upon terrestrial events. On the contrary, they are aware that all the generated things in the universe are dependent on one another. God the Omnipotent created numerous stars and scattered them in the sky, some of which are beneficent and some malefic. Some of them are related to living creatures and some to deceased ones. Some have positive effects on the prosperity of the world, and some others act to destroy it. Every single celestial object has peculiar characteristics, and the world of generation and corruption runs on this celestial influence. Even the roaming of an ant on earth is caused by a particular celestial situation, and the death of a mosquito is affected by the adversity of its ascendant. Whatever particular happens in this world corresponds to a special configuration in the celestial orbs. This does not mean, however, that the celestial bodies are the real efficient causes (esbāb-i mū’essirāt, ‘īlel-i mūcibāt). All the things that occur in this world are due only to
His actions.\(^{122}\)

Upon recalling the basic cosmological principles and reemphasizing the definitive causal link between the celestial and terrestrial spheres, Sinān Paşa correlates the science of the munajjims to some other divinatory practices including omoplatoscopy (‘ilm al-aktāf), ornithomancy (‘ilm al-tūra), or palmomancy (‘ilm al-ikhtilāj).\(^{123}\) For Sinān Paşa, the most prestigious ones among these divinatory sciences are geomancy and nujūm. None of these divinatory sciences were invented without purpose. Most of them were originally created by divine inspiration but they were eventually distorted at the hands of ignorant people. It is difficult

\(^{122}\) Ibid., 480-486 [although the original work was written in verse and the modern edition of it followed the same pattern, I turn it here into prose for the ease of denotation]: “Ekser müneccim olanlar gabi olurlar, onlar kaçan ‘alim-i gaybî olurlar? O daхи Allâh’un bir mevhibesidur, kime gerekse müyesser olmaz ... Ehl-i tencimîn coğ’ ‘abede-i tab’ olur ve harase-i kevâkıb-i seb’ a olur. Şevâbit hâlînden o kadar şaberi olmaz ve onun evzâ’ından gelen eseri tamam bilmez. Gâh olur ki bir važ’ ile hükm ider bir važ’-i âhar onî bozヌ olヌ, hemîn bu važ’-i görヌ važ’-i âhar onî muhâlif olヌ olヌ. Bağsî testîşî nef’ diyî i’iṭkâd ider şerr çıkar ve baž’-i terbî’i şerr diyî hükm ider hayr çıkar. ...[S]unlar ki erbâb-ı din-i kayîm olurlar, onlar da’ i’mâ bî-zic ve takîm olurlar. Pes bunlarunî inkâr larunuñ ma’nâsî ve sözelînîn fehvasî bu değûlûr kim bunlar kevâkıbîn evzâ’ ve hâlâtuna ve o hâlâtun süfîlyâta irtibâtâtuna inkâr iderler. Nice inkâr iderler ki bu Allâh te’alâmün bir kurdet-i ‘açibe ve hikmet-i garîbesidur ki cümle ‘alêmün ahvâlî birbirine muhtelît ve her birini âhara murtabît yaratmışdur. Şöyle ki semâda kevâkıb-ı menşüre yaratmışdur ki kimiş sîrîrê ve kimiş hayyirdûr ... Bağsî nüçûm-ı şâbitedûr, her birinîn tab’inda bir hâsşa şâbitedûr ... Kimiş ‘alêmün ‘imâretin sever ve kimiş ‘harâb olub yükülmasın ister ... Fîl-cümle her birinîn lîklâtında bir hikmet vardur mu’mam ... Çûmlesinîn ictîmî’îndan bir hâlet-i mutavassîta peydâ olur şöyle ki ‘alêm-i kevî ü fesâd şu görûnên üzerine hüveydâ olur. Şattî bir karançanûn yerde haretêki semâda bir hâlet hey’etinden olur ve bir ba’ﱐanûn bundan vejfi’ti tâli’înde bir ulu nûhûseten olur. Her ne cîz’i ki bundan buluna felekte bir važ’ olur ki oña muvâfîk olur ve her ne hâdisê ki yerde belire gökte bir hâlet-i hâdisê olur ki oña mu’tâbik olur. Bunun sebebi bu değûlûr kim nûfûs-ı felekîyê esbâb-ı mü eşsirât ola ve evzâ’-i ‘ulviyât’ ʿîle-i mûcbîb ola. Bilki Allâhtan gayrîna çare yoktur te ʿîr olmaz, mûmkün de hôgul mümkûnca icâd bulunmaz ... Bundan ulu kuḍret mi olur ki yâhûz evzâ’-ı-felekîyê de hôgul her mevcûda cemî’-i mevcûdâtun fesâsilinîn ‘alamûti bilinîr ve her bir zerreda cemî’-i kînînatîn ahvâlinîn işârâtı anlânur?”

\(^{123}\) For a superb exploration of numerous divinatory sciences appealed to in Islamic history and culture, see Toufic Fahd, La divination arabe, études religieuses, sociologiques et folkloriques sur le milieu natif de l’Islam (Leiden: Brill, 1966).
now, according to Sinan Paşa, to find an erudite munajjim who can accurately calculate the celestial configurations and deduce their astrological indications. One cannot, however, partake in the sphere of occult matters only by technical knowhow. It also requires having mystical leanings and following an abstinent and pious life. The esoteric sciences (al-ʿulūm al-rūhaniyya) are so numerous that no one could ever be the master of all. What the so-called masters of esoteric sciences say is all false and corrupt. One cannot haphazardly divine occult matters; there should be no room in such an enterprise for conjectures and speculations. This is the reason why the Prophet Muhammad warned his people not to believe in and appeal to munajjims. Another reason for the Prophet’s admonition was that most of the munajjims at the time were disgraceful soothsayers of the community of Arabs, many of whom were from among the infidels. As Sinan Paşa highlights, it is not proper to turn to the words of oracles instead of obeying the master of the revelation. Not all sciences enhance one’s intellectual strength; some of them exacerbate the ignorance. The implications in his discussion are clear that Sinan Paşa regarded astrology as one of them.124

124 Sinan Paşa, Maārif-nâme, 486-492: “Meşelâ bir koyun kemiğine bâkârlar nice türli hükmeler ıderler ve her yerde nice ‘acûzeler olur ki arpa salmak ile mûgayyebât birĭler. ‘Arib’dâ bir tä’ife olur imiş ki bir kuşuñ važ’ina bâkârlarımış, onun eţvâz inden hezâr akmâ-ı şahiha ıderlermiş ... Daţi nice bunun gibi ʿulûm vardur ki her birini bir tä’ife kendü kesbi içûn sanʿat idinmişdür ve her birini bir kavm mûgayyebâtđandan ĥâber virmek içûn âlet idinmişdür. Gâyet reml veya nüçûm daň onların birisidür ve bu ikisi aralarında ulûsîdur. Cümlesînînî ašlı vardu ber ‘abes konulmayub durur, ekşerînîn ibtidâsi bir ilhâm-ı rabbânî ile olub durur. Şoîra nā-ehillere düşmüş buzułmuşdur, hêmîn ašîndan bir cûz ‘icî eşer kalmişdür. Şîndî nice müneccim bulunur ki eţvâz-ı jelekiyyeyî gökçek zaht ide ve ona tefrî” itûüğî akmâ-bî-hašt ide ... Mûgayyebâtâ ĥûkm eylemek kûru kavâid ve uşûl bîmle ile olmaz ve o ‘îlimleri ‘amele getûrmek müçerred ebvâb ve fuşûl bîmle ile olmaz. Onlarda elbette bir nûrânî hâlet gerek ve onlarda her dem perhiz ve riyyâzet gerek ... Fîl-cûmle ʿulûm-ı rûhâniyênûnî envâî ʾi çûktur, eşerî değme yerde onun tamâm bîlîri yektur. Ekşer-i kelimâtîlîr ekâţîb ve türrêhâîdur ve ekşer-ı akmâmîlîr ebâtîl ve mûzâhrafâtûr. ʿUlûm-ı gaybîyyeyde recem biʾl-gayb yaraSTMaz ve aţbâr-ı mûgayyebâtđa zann ve taḥmîn yakaSTMaz. Bu cihetden ötürdür ki şâhiba-ı şerî at ... müneccimîlere inanmayun diye
It is quite surprising to see that Sinān Paşa, an erudite mathematician who later turned into a Sufi, pairing astrology with magic and divination, and charging munajjims with astral determinism. As I will mention in more detail in the third chapter, Mīrīm Çelebi (d. 1525), one of the key astral experts who provided astrological service to the late-fifteenth- and early-sixteenth-century Ottoman court, is considered to have studied mathematical sciences with him just before Sinān Paşa initiated into Sufism. It is highly likely that Sinān Paşa’s critical phraseology about munajjims was a product of his late introduction to the Sufi path, as we have ample evidence from the period in question that to scorn for munajjims was a theme frequently visited by eminent Sufis. The Sufi disdain toward munajjims did not always entail, however, a discomfort with fundamental astrological presumptions. As evident from Sinān Paşa’s long discussion paraphrased above, in which he went on to say that even the most insignificant issues in the sublunary world such as the death of a mosquito are ruled by the commensurate positions of the celestial bodies, the astral causality between the celestial objects and terrestrial events was barely questioned.\footnote{Sinān Paşa, \textit{Maârif-nâme}, 486.}

Like Sinān Paşa, several prominent Sufis active in the Ottoman world during the period in question expressed their contempt for munajjims and their truth claims. One of them was the famous Ḥalveti shaykh Ībrahîm-i Gûlşenî (d. 1534), a curious episode about whom at the court of the Aqquyunlu sultan Yaʿqûb (r. 1478-1490), before Gûlşenî’s move to the Ottoman domain, involves sultan’s munajjims and Gûlşenî’s critique of them. According to the story recounted in

\textit{emr itdi ve ḥalğa onlara mürâca’at itmeyin diyyü zecr itdi. Ve bir sebeb daхи bu idi ki ekşer müneccimler o zamanda ‘Arab içinde kehene-i fecere olurlar idi ve ekşer gaybdan ḥaber verenler o ‘âşrada zümre-i kefere olurlar idi. Vahy dururken erbâb-ı kehânete varmak edeb değil idi. Şâhib-i risâleti koyub şâhib-i cehâlete varmak de’b değil idi. Her ‘ilm şöyle değildir ki ‘aliminûn kadrini ve celalini arturur, nice fenn olur kim şâhibinûn cehâletini arturur.”}

\footnote{Sinān Paşa, \textit{Maârif-nâme}, 486.}
his *menâkîbnâme* written by Muḥyī-i Gûlšenî (d. 1604), when Sulṭân Yaʾqûbʾs second cousin Bayandur ibn Rustam decided to attack the forces of the sultan, Yaʾqûbʾs *munajjims*, who received, according to the narrative, hundreds of thousands of *aḳçes*, apparently interpreted the astrological signs of the moment as an omen of the approaching defeat of the sultan. When these court *munajjims* saw Shaykh ʾĪbrahîm-i Gûlšenî accompanying the sultan, they wondered but asked: “Why did not you just leave when his defeat is obvious according to our astrological calculations? As the *munajjims* of the sultan we had no other choice but to accompany him.”\(^\text{126}\) Gûlšenî in his reply told them that what he noticed in the “divine astrolabe” (*uṣṭurlab*-i ilâhî) was rather the victory of the sultan and the death of Bayandur. Thereby, according to Gûlšenî, the *hadîth* of the Prophet, “all astrologers are liars”, would prove true.\(^\text{127}\) When the *munajjims* insisted on their interpretation, Gûlšenî challenged them by asking: “If your predictions will turn out wrong, would you let me have your salaries cut in substance?”\(^\text{128}\) The *munajjims* apparently panicked before Gûlšenîʾs self-confidence and determination, and pleaded with him not to do so. Seeing the *munajjims* stepping back, Gûlšenî said: “Had your craft leaned on reliable proofs, you would not have started doubting your interpretations.”\(^\text{129}\) Eventually Gûlšenî heard that Yaʾqûb defeated Bayandur, and his predictions proved true.

Needless to say, this little anecdote recounted in a hagiographical work should not be


\(^{127}\) Ibid.: “Uṣṭurlab-i ilâhîde böyle müşâhede olur ki Bayındür maḥtûl olup sulṭân manṣûr ve muzaffer gele ki ‘kullu munajjimin kadhdhabûn’ ʾhadîsi şîhâṭ bula.”

\(^{128}\) Ibid.: “Anlar yine iʾtikadlari üzere baʾzi kelimât idîcek, şeyh dimiş ki ‘Eger sözünüz yalan olursa ʿulâfenzî katʾ itdûreyim mi?’”

\(^{129}\) Ibid.: “Müneccimler tažarruʾ idîp dimişler ki ‘Meded! Kimseye bunu söyleme ve öyle eyleme!’ diyicek şeyh dimiş ki ‘Eger sizûn ʿamelûnûz katʾi olsa, şimdi tereddûd ve şûbhe târî olmazdı.’”
taken at face value, as it serves to proving the mental superiority of Ībrahīm-i Gûlşenī as a Sufi master. Yet it still gives colorful insights into both contemporary Sufi attitudes toward the practice of astrology and the potential rivalries between men of competing fields of expertise. The story of Ībrahīm-i Gûlşenī is not the only case where the authority of shaykhs and darvishes to foretell the future through more esoteric and intuitive means clashed with the authority of munajjims who needed recourse to other, more technical, means to interpret the future course of events. For example, the Bayramî shaykh Ibn Îsâ Saruhânî (d. 1559-60), who flourished during the reign of Süleymân the Magnificent, frequently derided munajjims in his relatively popular jîfr book, Rumûzü’l-kûnûz.\(^\text{130}\) In this enigmatic work originally composed in 1558 and widely copied afterwards with many different addenda, Saruhânî prognosticates on the principles of Ḱilm al-jîfr about the fate of the Ottoman dynasty until the year 2035 Hijra — or until 3000 in certain copies. For Saruhânî, what is incumbent upon the sultans and princes is to spend more time with shaykhs and gnostics, and to completely disregard the words of munajjims and geomancers. According to Saruhânî, unlike real men of wisdom, such people are deprived of the divine qualities of karâma and walâya. Therefore all the things they say are nothing but chimerical thoughts.\(^\text{131}\)

\(^{130}\) For Saruhânî, see: Cemal Kurnaz and Mustafa Tatç, “Îbn Îsa,” TDVİA. One particular copy of the text available at the BnF was briefly examined by Işık Tamdoğan-Abel in the following study: “Le future dans le Rumuz-i Kunuz de Mejdeddin Ibn Isa: Une utopie, une prophétie, un livre à mystères,” in Melâmis-Bayrâmî: études sur tois mouvements mystiques musulmans, ed. Nathalie Clayer, Alexandre Popovic, Thierry Zarcone (Istanbul: Isis, 1998), 145-152. Another copy of the text available at the National Library of Turkey was transcribed in the following study: Ayhan Özgül, “İlyas b. İsâ-yı Saruhânî’nin ‘Rumûzü’l-Kûnûz’ adlı eserinin transkripsiyonu ve değerlendirme.” (MA Thesis, Kırıkkale University, 2004).

The most intriguing case of the rivalry between the Sufi shaykhs and the experts of astral sciences is an anonymous letter located now in the Archive of the Topkapı Palace Museum. In this undated letter, the anonymous author, who speaks in the idiom of a highly self-confident and assertive Sufi shaykh using alchemical jargon, writes that as far as he has heard, the Ottoman Sultan Bāyezīd II had sunk his teeth into learning ‘ilm al-hay’a along with another formidable branch of natural philosophy (ḥikmat), which he does not explicitly name. In his opinion, however, Bāyezīd did not have sufficient erudition, and his attempt was made solely on the basis of experience (tecribe). It is the author’s desire to remind the sultan, whom he characterizes as a zealous servant in the path of Islam, of the transitory nature of life and the insignificance of worldly possessions. He then says that he has decided, in accordance with the portents in his dream, to send Bāyezīd one of his disciples to inculcate in him his real essence. The training should continue, the shaykh argues, until Bāyezīd attains the spiritual stage that his disciple has already reached at the hands of the master. Once Bāyezīd reaches that stage, then he, the author, will write a talismanic note for the sultan, whereby Bāyezīd could gain real access to the secrets he has been searching for. To justify his preference to send his disciple instead of being physically in the sultan’s immediate presence, the anonymous shaykh also says that he is afraid of being gürüb anlaruñ ‘ilmine kıyâs itmeyüb keş-f-i rumûz ve kûnûz esrâr-i ilâhîdîr diyü i’tîkâd idûb ehlinden dür olmayalar.”

132 TSMA E. 6172.
133 Ibid., “[...] Mâlik-i memleket-i Rûmiyye kim âl-i ‘Osmâniyeden Sulṭân Bâyezîd’dür. Şöyle istimâ’ olundy ki şina’at el-hey’ete ve bir ḥikmete ki ḥikmeti muhîbdîr ّalmış ammâ tecride tařîkiylemiş vuğûf yoğımış.”
134 Ibid., “[...] Benüm überime lâzüm oldu ki aňâ şefakat idûb tenbîh eyleyem ... metâ’-i dünyâ kâllîdîr biz bundan raḩîl âşerîneyûz. İstiḥâre itîdîm ّayr şûnda gördüm ki şâkirdlerinden birîni gönderem. Vara, aňâ mâddesin ta’îm eyleye.”
135 Ibid. “[şâkird] benden gördügi mertebeye dek tedbîr eyleye. Ol mertebeye vâşîl olıca baňa i’lâm eyleye ben bir remz yazam ki kâşîf ola ... tâ ki târîh-i iksîre şâlih ola.”

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of interacting with the sultan, as wise men should refrain from consorting with rulers, for the ruler may abuse the knowledge imparted because they are not like wise men.\(^\text{136}\)

Besides providing evidence for how relationships between Sufis and sultans were initiated and negotiated, and alluding to the contemporary recognition of Bāyezīd II’s deep celestial interests, which I will further discuss in more detail in the third chapter, this letter unequivocally shows that the mystical and intuitive expertise of individuals with overt Sufi leanings might have contradicted the technical scientific expertise of the munajjims. The way the anonymous author uses the concept of experience (tecribe) is particularly worth pondering here. Although this concept had various connotations in medieval Islamic intellectual context, it is usually associated among Sufi circles with a special mode of knowing based on intuition. However, the author of this short report, despite speaking with a certain Sufi tone, belittles it, as this is, as far as he has heard, how Bāyezīd II has been accustomed to methodically studying the science of the stars and the other formidable branch of natural philosophy left unspecified. What the author means by the term thus seems to be related to a kind of knowing based not on intuition or personal inspiration, but rather on bookish learning, observation, and perhaps even empirical study.

These several lines of arguments issued by a wide range of opponents, including the Hanbali jurists of the Mamluk times or the pan-epistemic Sufis in the Ottoman realm have manifested that the real source of apprehension is found rather in the alleged claims of munajjims than the epistemological foundations of the astrological science itself. In different examples of

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\(^{136}\) Ibid., “[...] püşide olmaya ki eger andan korkmasam Allah rızâsiyçün ta’lim itmekden ben kendüm varurdum ammâ hekim olan intinâ’ ider hakkime musâhebet eylemekden, hakkim kendü gibi hekim olmaz.”
the polemical literature, *munajjims* were often characterized and caricatured as outrageous quacks and/or magicians, shamelessly asserting the idea of astral determinism and even the star worshipping. However, as we have already seen in the authentic writings of the *munajjims* who served the Ottoman court, the real practitioners of the “learned”/mathematical astrology were also unsympathetic toward the deterministic fatalism of the stars. For a more accurate assessment of identities and claims of the *munajjims*, we should try to answer —on the basis of hard, authentic evidence— what it really meant and entailed in the designated past to be an erudite *munajjim*. This question will guide the discussion in the following two chapters.
Chapter Two—How to be a *Munajjim* in the Ottoman Realm, 1450s–1550s: Vocational Training, Sources of Learning, and Venues of Knowledge

II. 1. Introduction

In an intriguing passage on the “discovery” of the Antilles in his *Kitāb-ı Bahriye*, the famous sixteenth-century Ottoman seafarer and naval captain Pīrī Reis (d. 1554) introduces Christopher Columbus as “a Genoese *munajjim*.”¹ In this text, which Pīrī Reis started writing in the 1510s and finished in the late 1520s upon the request of grand vizier İbrahim Paşa (d. 1538), Columbus is described as a *munajjim* possessing a legendary book that descended from the time of Alexander and comprised of the secrets of the “science of the sea” (*deryāʾ ilmi*). According to Pīrī Reis, no patron in Europe had paid attention to Columbus and the book he held. Eventually, the Spanish ruler decided to invest in him and provided the necessary material support for his voyage. By means of the information covered in this book was Columbus able, according to Pīrī Reis, to sail out west into the Atlantic and reach the Antilles.

It is difficult to ascertain whether Pīrī Reis was aware of Columbus’s genuine interests in astral sciences and occult lore when designating him a *munajjim*. The vast literature on Columbus underlines that he was marked in his own time for his deep literacy in these fields of

knowledge. According to his son’s biography, Columbus studied for a while at the University of Pavia where he gave himself to the study of astronomy and geometry that he would later put into the service of his nautical activities and apocalyptic concerns. Aside from the necessary technical astronomical and mathematical numeracy for cosmography and navigation, he was particularly moved by the Joachimite eschatological lore. He had strong belief in his own role in fulfilling a number of prophecies before the coming of the Antichrist and the end of the world. He worked for a number of years on collecting materials for a volume called the *Book of Prophecies* that he intended to prove his destined role in his own vision of history but he never finished it. Given all the contemporary information about Columbus’s life and his intellectual and professional pursuits, it is all the more interesting to find an early sixteenth-century Ottoman seafarer and cartographer defining his Genoese colleague with the epithet *munajjim*.

No matter what Piri Reis had in mind when describing Columbus as a *munajjim*, it is worth mentioning this curious fact to start penetrating the late fifteenth- and early sixteenth-century Ottoman social and cultural context, which this chapter and the following will try to examine with a view toward discussing the role of *munajjims* therein. What made an individual qualify for *munajjim* status in the Ottoman world in the period? What constituted the intellectual capital a practicing *munajjim* needed? In what specific fields of knowledge was a *munajjim* supposed to be learned? What are the books and instruments a would-be *munajjim* was expected to possess? Where could one acquire the required knowledge? Were there any institutional means for a would-be *munajjim* to receive training in the essentials of the science? Would a

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madrasa welcome him? What role did courts play in the training and subsequent professional career of a munajjim? What were the factors in the making and breaking of his career? Were there any considerable differences between the categories/professions of munajjim or muwaqqit?

Notwithstanding the difficulties resulting from scattered, and in most cases limited, evidence that one can glean from contemporary sources, I will strive to present the complex social history of munajjims in the Ottoman world based upon authentic writings of practicing munajjims, archival documents, and biographical remarks in contemporary narrative sources. Available sources do not allow us to reconstruct a full biography of any practicing munajjim in the Ottoman milieu in the concerning period, depicting all the details of his training, professional networks, and the ups and downs of his career. Hence, in the absence of a single convenient individual upon whom to focus, I will adopt throughout this and the next chapter an eclectic approach, using instances from the lives of various practitioners.

The relevant archival documents mostly comprise salary registers that list the names and wages of palace personnel. These registers often include information on the munajjims. From the late fifteenth to the mid-sixteenth century, there are a handful of such surviving registers that can help us track the fluctuating status and pay scale of court munajjims. In that respect, compared to other studies on the social and cultural history of munajjims in the medieval and early modern Islamicate world that are based exclusively upon anecdotal evidence, the case of munajjims in the Ottoman realm presents us with an invaluable opportunity to substantiate the courtly presence and service of astrologers with hard, archival evidence. There are, however, two important pitfalls of the available archival sources. First, these registers, by nature, contain information only about those practitioners affiliated with the dynastic court; thus the munajjims
who did not enjoy dynastic patronage or who flourished elsewhere were naturally excluded. Second, these registers indeed provide very limited information on the lives of munajjims. More often than not they reveal only the names of those practitioners and the amounts of the allowances they received. Therefore, the archival evidence alone is insufficient to illuminate the social and cultural history of Ottoman munajjims, their training, the scope of their professional service, and possible scholarly rivalries among different experts.

The authentic writings of munajjims—including taqwīms, horoscopes, and treatises of various kinds—will also be used in this chapter and the next to supplement the data provided by the archival documents. These astrological sources are crucial for establishing the contours of the scientific canon utilized by practicing munajjims in the Ottoman capital at the time. Nevertheless, one should also keep in mind that these sources, especially the taqwīms and horoscopes, most of which remain anonymous, bear very few personal details that can help us lay out the mechanisms of munajjims’ training and the entangled dynamics of their professional service.

For delving into munajjims’ personal lives, contemporary narrative sources, including chronicles and biographical dictionaries may provide insightful details. Yet in the fifteenth- and sixteenth-century Ottoman case, historical narratives and biographical sources provide surprisingly little information. Notwithstanding that Ottoman chronicles and historical narratives are replete with remarks on the calculation of astrologically auspicious moments computed and interpreted by munajjims before an imperial activity was undertaken, these rather vague remarks do not reveal the identities of experts.

In a similar vein, munajjims were not among the favorite subjects of contemporary
biographers. As already mentioned in the Introduction, fifteenth- and sixteenth-century Ottoman writing culture is devoid of sources with full anecdotes on munajjims like Faraj al-mahmūm of Ibn Ṭawūs (d. 1266) or the Chahār maqāla of Niẓāmī-i Arūḍī. The only known Ottoman attempt to compile a special biographical dictionary of famous experts of celestial knowledge from the Babylonians up to the Europeans was the Ṭabakāt-i müneccimīn of Süleymān Su’dī Efendi (d. 1896), but since his purpose was undoubtedly different the text provides very little useful information on munajjims in the Ottoman realm. Canonical examples of sixteenth-century Ottoman biographical dictionaries of scholars and poets such as Taşköprüzāde’s (d. 1561) al-Shaqā‘īq al-nu‘māniyya fi ‘ulamā‘ al-dawla al-‘uthmāniyya, Latifi’s (d. 1582) Tezkiretüş-su’arā‘, or ‘Āşık Çelebi’s (d. 1572) Meşā‘iruş-su’arā‘ also furnish limited information on the lives of astral experts. While the tezkires of poets often provide more personal details, these collections by nature contain biographical information only about those individuals composing poetry. Thus, it is difficult to find in these sources evidence on the lives and careers of the munajjims whose names are recorded in the archival registers.

Facing these shortcomings of the available sources from the period, I will combine all the available evidence drawn from distinct types of sources on different individuals in order to shed

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3 Suleyman Südî Efendi, Tabakat-i Müneccimîn, ed. Salim Aydüz (İstanbul: Fatih Üniversitesi Yayınları, 2007). For a textual example comparable to Niẓâmî-i Arūḍî’s Chahār maqāla, one may speak of Kefeli Hûseyin’s (d. 1601) Râznâme, in which Hûseyin compiles stories and anecdotes pertaining to the practice of bibliomancy that he has read, personally witnessed, or heard from others. One of his anecdotes in the compilation is related to a certain ‘Abdül’aziz müneccim, who decided later in his life to abandon astrology after realizing the severity of Prophet’s saying, “all munajjims are liars.” As ‘Abdül’aziz renounced the ‘useless’ craft and promised himself not to take an astrolabe in his hand anymore, he opened the Divân of Hafez and found the following verse: “Hold the forelock of a moon-faced, don’t tell a story/For good and evil fortune derives from the impact of Venus and Saturn.” See Kefeli Hûseyin, Râznâme, transcription and facsimile prepared by İ. Hakkı Aksoyak (Cambridge: Harvard University the Department of Near Eastern Languages and Civilizations, 2004), 147.
light upon the fundamental question this and the next chapter tackle: What did becoming a **munajjim** in the late-fifteenth and early-sixteenth century Ottoman world entail? The possible answers require investigating several ancillary questions, on three of which will I focus in this chapter and the next: i) What did a **munajjim** need to know, ii) Where could he learn the things he needed to know, and iii) Where and how could he put into practice the things he knew?4 In this chapter I will particularly delve into the books in circulation that were frequently used by practicing **munajjims** at the time and discuss the extent of the role of the **madrasa** and mosque in the instruction of astrologically valid knowledge. The next chapter will scrutinize the dynamics of courtly patronage and examine the impact of the office of court **munajjims** upon the pedagogical needs and professional careers of practitioners.

Although these questions may signal that these two chapters will be descriptive narratives instead of historical ones, these points should rather be regarded as themes to be followed to unveil the particular context of the Ottoman world in the late fifteenth and the first half of the sixteenth century with an eye toward tracking the special case of **munajjims**. The significance of the period derives from the fact that it marks a turning point not only for the appropriation and subsequent codification in the Ottoman world of the post-thirteenth century astral tradition of the Persianate East but also for the growing systematization of the patronage of astral expertise through the institutionalization of the permanent office of court **munajjims**. While the initial attempts of Meḥmed II (r. 1444-46 and 1451-81) played a definite role in the process, the lion’s

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4 Although I have not come across any reference to a female **munajjim** in Ottoman sources, there were known female **munajjims** in the Islamic realm, the most famous of whom was al-Ḥabībī al-**muna**jima**, the mother of the thirteenth-century chronicler Ibn Bībī and a working astrologer at the court of Jalāl al-Dīn Khwārazm-shāh (r. 1220-1231). See Sara Kuehn, *The Dragon in Medieval East Christian and Islamic Art* (Leiden: Brill, 2011), 135.
share of the credit should go to Bāyezīd II (r. 1481-1512), whose keen interest in learning and cultivating different forms of celestial knowledge facilitated the adoption of the necessary technical know-how and the institutionalization of the patronage of munajjims. The scope and impact of Bāyezīd II’s patronage will be discussed in detail in the next chapter.

II. 2. State of the Field and the Problems of Terminology

It is a challenging task to accurately translate the term munajjim into English. The difficulty derives from discrepancies between the connotations of the term in past sources and modern scholarship. As already implied in Pīrī Reis’s curious use of the word to describe Columbus, the category of munajjim referred to a profession that is much more inclusive than that rendered by the modern term “astrologer.” The expertise of munajjims not only consisted of astrology but might have also entailed mastery over other implications of celestial knowledge, including cosmography, geography, navigation, time reckoning, and calendar conversion. It is true that in the medieval Islamic world there were other types of nomenclature reflecting further specializations in the broader discipline of celestial knowledge such as the category of muwaqqit, which, especially from the thirteenth century onwards, came to denote the timekeeper at the grand Friday mosques. Moreover, not all individuals conversant in the theoretical iterations of celestial knowledge were eager to practice astrology. In that regard, modern scholars, especially those studying the history of scientific tradition in the Islamic world, are often confounded in

choosing the best title to identify the past experts of celestial knowledge.

What sort of label should we use to describe, for instance, Naṣīr al-Dīn Ṭūsī or Wābkanawī (known in his own time as shams al-munajjim), whose scholarly activities were also informed by astrological purposes as we have already seen in the first chapter? The use of “astronomer” does not always solve the problem, for it is indeed a loaded term, deliberately employed in the history-of-science tradition in the Islamic context to carefully detach astrological constituents from the “rational” scientific enterprises of individuals so described. The use of “astrologer” also does not do much justice, given the widespread modern pejorative meanings attached to it, ranging from soothsayer and diviner to quack, calling to mind as it does fortune tellers with no particular qualifications. Take, for instance, the case of the prominent historian of science George Saliba, whose invaluable works on different aspects of theoretical and practical celestial knowledge in pre-modern Islamicate culture have opened new vistas for research. For Saliba, figures like Muḥyī al-Dīn al-Maghribī (d. 1283) or Naṣīr al-Dīn Ṭūsī, who never shied away from following astrological pursuits and who explicitly mentioned the astrological uses of their scholarship even in their strictly astronomical works like Talkhīṣ-i Majisti or Žīj-i Īlkānī, still can not be defined simply as “astrologers,” lest the word “astrologer” belittle their scientific values and contributions. In a similar vein, in the eyes of Saliba and many others, an erudite medieval practitioner of astrology, who was able to make complex mathematical calculations on the basis of astronomical tables and use of instruments, does not qualify as an “astronomer” unless he engaged in the production of texts that may be qualified as

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“astronomical.”

In order to bypass these terminological problems and attempt to convey a sense of the historical implications of the vocabulary, I will employ the original terms as used in primary sources without translation. From the outset, the readers are advised that the category of *munajjim* as used throughout this dissertation specifically refers to learned experts in mathematical celestial knowledge who were evidently engaged in astrological activity. While the term *munajjim* was also used, as we have already seen in the first chapter, in the polemical literature of non-astral experts to designate unqualified street astrologers or quacks, I should reiterate that my use throughout gives precedence to the practice of learned mathematical astrology.

The social history of *munajjims* in medieval and early-modern Muslim society has been explored so far in a handful of studies. The most well-known of these modern examinations, George Saliba’s oft-cited article “The Role of the Astrologer in Medieval Islamic Society,” discusses the complex role of astrologer in medieval society by relying upon anecdotal biographical and literary sources as well as visual materials.7 Reflecting his perspective in another influential article on the definitive separation of *ilm al-hay’a* and *ilm aḥkām al-nujūm*, Saliba’s use of the category of *munajjim* is rather slanted toward a kind of lay practitioner who performed astrology with little or no knowledge of the “scientific” technicalities of celestial knowledge.8 Although Saliba acknowledges *munajjims*’ use of astronomical tables and other

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instruments, his study does not primarily discuss the scientific background of astrological practice.

Saliba’s survey of the social status and role of astrologers in medieval Islamic society was later expanded by more focused examinations of *munajjims* in particular historical contexts. Miquel Forcada, for instance, takes the case of *munajjims* in the court of Andalusian Umayyad ruler ‘Abd al-Rahman II (r. 822-852) and looks for the potential of prosopographical approach for studying the social status of astrologers. Like Saliba, Forcada relies upon anecdotal biographical sources and anthologies, but, as he admits, the sources he was able to find present far less on the lives and careers of *munajjims* than he expected. In addition to Forcada, the status of astrologers in the medieval and early-modern Indian courtly context became the subject of several articles by David Pingree, S. Rajeswara Sarma, Eva Orthmann, and most recently by Audrius Beinorius. Besides biographical and narrative sources, Beinorius for instance refers to archival evidence such as land grants given to astral experts for correctly predicting eclipses.

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Moreover, both Sarma and Orthmann briefly discuss the office of jyotisāraja or jośirāya, the Hindu astrologer installed at the Mughal court by Akbar.

The relevant literature is even broader as regards to the courtly patronage of munajjims and the services they offered. The early Abbasid court has already been spotlighted by modern scholars for its immense interest in the cultivation of astrological knowledge and patronage of munajjims. The works of Dimitri Gutas, David Pingree, and more recently Antoine Borrut, use authentic textual materials composed and/or translated at the time by the practicing experts. While Pingree, from the more technical perspective of the history of science, focuses more upon the dimension of textual transmission, Gutas and Borrut have interpreted the early Abbasid support for astrology on political grounds and convincingly demonstrated the deployment of astrological knowledge against the backdrop of the Abbasid political claims and legitimacy issues. Local dynasties, like the Hamdanids in Aleppo in the tenth century, also have received scholarly attention, and a few scholars have remarked upon the services of al-Qabīṣī (d. 967), one of the noted and prolific munajjims at the court of Sayf al-Dawla (r. 945-967). The Rasulid dynasty in Yemen has also been studied with respect to the interest of several rulers in the

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services and expertise of munajjims. One important aspect of the Rasulid period was the personal investment of some of its rulers in studying different branches and genres of celestial knowledge. In the Andalusian and North African context, in addition to Forcada’s study cited above, Julio Samsó’s works have shed light upon the production and uses of different genres of celestial knowledge in the courtly context. Sonja Brentjes has published important survey studies on the cultivation of mathematical and ancient sciences (al-ʿulūm al-awā’il) in late-medieval Islamic courtly culture, though her studies are not particularly informed by the cases of munajjims. Thomas Allsen’s work on the cultural life under the Mongols also touches upon the cultivation of astral sciences at the court of Ilkhanid rulers and discusses the extent of cross-cultural scientific exchanges between Iranian and Chinese realms. Several Turkish-speaking scholars have documented the presence of munajjims at the courts of post-Mongol Turko-Persian dynasties, including the Ilkhanids, Rum Saljuqs, and Aqquyunlus on the basis of mere anecdotal

15 In addition to her work cited above, see “Patronage of the mathematical sciences in Islamic societies: structure and rhetoric, identities, and outcomes,” in The Oxford Handbook of the History of Mathematics, ed. Eleanor Robson and Jackie Stedall (Oxford: Oxford University Press, 2008), 301-28; idem., “Ayyubid Princes and their Scholarly Clients from the Ancient Sciences,” in Court Cultures in the Muslim World: Seventh to Nineteenth Centuries, ed. Albrecht Fuess and Jan-Peter Hartung (London: Routledge, 2010), 326-56.
evidence gleaned from chronicles and historical narratives. Timurids, particularly the court of Mīrzā Iskandar b. ʿUmar Shaykh (d. 1415), have received a remarkable amount of scholarly attention, especially by art historians, thanks to his surviving illuminated horoscope, but I should note here that the genuine celestial and other scientific activities at his court have yet to be thoroughly examined. The court of Sultan Ḥusayn Bayqara has also been briefly discussed in the context of an astrological compendium, Lavāyiḥ al-Qamar, compiled by Ḥusayn Vāʿiz-i Kāshīfī (d. 1505) at the request of Ḥusayn Bayqara’s grand vizier. Sayılı’s seminal work on observatories in Islamic history tries to depict the role of courtly patronage at the time of the

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Ilkhanids, Timurids, and the late-sixteenth century Ottomans, but since his primary concern was to demonstrate the mathematical and astronomical achievements attained at the observatories, his discussion on the courtly patronage of *munajjims* in the post-thirteenth century Turko-Persian zone is rather limited. Salim Aydüz’s work in Turkish on the office of *müneccimbaşi* in the Ottoman context still remains the most comprehensive study on the history of court *munajjims*, producing a detailed and useful list of names employed as court *munajjims* throughout the entire course of Ottoman history. However, the vast scope of his study (from the sixteenth to the early twentieth century) inevitably led to omissions, including some of *munajjims* active at the late fifteenth- and early sixteenth-century Ottoman court. Moreover, his insistence on the term *müneccimbaşi* is not always historically accurate, especially for the period prior to the mid-sixteenth century. Last but not least, Aydüz pays no attention to the original writings of *munajjims*, nor the books they potentially read, which makes it difficult to accurately reconstruct through his study the intellectual and scientific trajectories of practicing experts. One may also consider consulting Avner Ben Zaken’s study on the courtly context of astrological production in the late sixteenth- and seventeenth-century Ottoman context, though the scope of his scholarship does not particularly cover the issues that are central to this chapter. One should include Gülçin

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Tunalı’s studies on a mid-nineteenth century Ottoman court munajjim, whose surviving notes greatly help us understand the quotidian concerns of an astral expert. Finally, Stephen Blake has published a derivative account of the services of munajjims in three early modern Muslim empires, the Safavids, Ottomans, and Mughals. While Blake’s study is based almost entirely upon previous secondary literature with no or very little original contribution, his emphasis upon the computatio of time as the broader field of expertise of munajjims is worth mentioning.

As is evident from this general overview, the literature on the social and cultural history of munajjims in the medieval and early-modern Islamic context draws exclusively on anecdotal evidence extracted from contemporary narrative sources. In dearth of surviving textual materials composed by munajjims themselves and related archival documents, these narrative sources are sometimes the only means to understand and reconstruct the entangled social environment in which munajjims functioned. However, modern scholars should not forget the fact that anecdotes about munajjims were also imbued with a certain didactic tone due mostly to the controversies and polemics over astrology. They may either tend to ridicule munajjims through narrating their failures or overstate the significance of their service by underlining their accurate calculations and correct judgments. Therefore, for a more nuanced and balanced picture of the history of munajjims in a given historical context, the writings of astral experts in diverse branches of knowledge—celestial and otherwise—should be taken into consideration. Thereby one may find numerous problems in Ben-Zaken’s handling of sources, which Sonja Brentjes and Max Lejbowicz detail in their review in Aestimatio vol. 10 (2013), 1-24.


the opportunity to describe more accurately the intellectual and scientific basis of their practice, the sources and authoritative texts they utilized, and the personal and social issues involved in their training and professional service.

II. 3. What did a Munajjim Need to Know?

As mentioned in the above discussion of the secondary literature regarding the history of munajjims in medieval and early modern Islamicate world, modern scholars put emphasis on the broader social contexts as well as restraints in which munajjims had to operate. The services munajjims provided, their clientele, and the cultural and religious objections they confronted get the lion’s share of attention, whereas the scientific constituents of their practice are seldom regarded as a valid object of inquiry. This indifference in the secondary literature is categorically tied to modern widespread assumptions as to the futility of munajjims as a social category and the insignificance of their field of expertise. As a natural corollary to the general lack of interest in what the munajjims’ expertise really entailed, there is no serious investigation on how they practiced their business.

I will start with delineating the required body of knowledge that those munajjims serving the late-fifteenth and early-sixteenth century Ottoman court needed to know. By looking at the contents of their own writings, foremost among which are almanac-prognostications (ṭawqīm) and horoscopes, and extracting scholarly references therefrom, I will first lay the necessary groundwork and prepare a comprehensive list of authoritative texts heavily quoted by the
Ottoman *munajjims* of the time.\(^{25}\) I believe it is important to establish such a descriptive list from the very outset to familiarize readers with the titles and brief descriptions of the books that will occasionally be referred to throughout.

The inventory of texts appealed to by *munajjims* in the Ottoman world of the late-fifteenth and the first half of the sixteenth century includes: i) strictly astrological textbooks where one might find standard rules and basic astrological principles on the nature and characteristics of planets, signs of the zodiac, and certain celestial degrees, as well as specific techniques in different branches of astrological practice; ii) other types of works that are often defined in the literature as “astronomical” or “mathematical” such as the *zīj* literature (astronomical handbooks of tables) or treatises on the use of astronomical instruments, all of which naturally cover information crucial for astrological practice. As will be discussed in greater detail below, *zījes* stood as the number one item in the paraphernalia of a practicing *munajjim*, for they provided, like a medieval version of a modern computer software, the necessary data and parameters for determining in mathematical terms the celestial configuration in a given time for a specific location, which constituted the crux of astrological practice.

This detailed sketch of the intellectual framework will be followed by a discussion on practicing *munajjims’* social environment, in which they received their training. The major question that will be tackled is the role of institutional structures such as the *madrasa*, mosque, and, most importantly, the court in the production, study, and circulation of astrologically valid knowledge. While the focus will be upon the gradual establishment of the office of court *munajjims* in the Ottoman bureaucratic structure that contributed to the institutionalization of

\(^{25}\) By “Ottoman” *munajjims*, I refer to those astral experts serving the Ottoman courts, regardless of their ethno-religious backgrounds.
astral instruction from the late fifteenth century onwards, I will try to assess the extent to which astrological production and consumption penetrated into more traditional institutional settings like the madrasa and/or mosque. I believe the discussion here on Ottoman munajjims will also be useful for scholars elsewhere in Islamic studies, grappling with questions about the social and cultural history of knowledge in the medieval and early-modern periods.

The rich amount of surviving Ottoman astrological materials, particularly the annual almanac-prognostications (*taqwīm*) and partially the occasional horoscopes, which I will treat in greater detail in chapter four and five, enables us to track the scholarly references of contemporary astral experts. The *taqwīm* genre in particular, with its numerous extant examples, helps us chart in a systematic fashion, and even on a yearly basis, the changing scientific horizons and intellectual trends among practicing Ottoman munajjims. The preparation of these texts required the astral expert’s making detailed mathematical and astronomical computations of the celestial positions at the exact moment of the year-transfer, necessary for deriving astrological judgments. For that purpose, a well-trained munajjim needed to be knowledgeable in two specific genres: i) a valid *zīj* to calculate the celestial positions in a given time for a given locality (i.e., the moment of the year-transfer or birth, or any other occasion for which a horoscope was to be cast), and ii) a working astrological textbook that describes the dispositions of planets and signs as well as the indications of celestial positions. Having an astronomical instrument that would help the practicing munajjim determine the required celestial positions more swiftly and accurately was optional, for it might have been unaffordable for many a
practitioner.26 There is no need here to discuss in greater detail the significance of handasa (geometry), hisāb (arithmetic), and especially the hay’a texts that constitute the necessary groundwork for any serious astral endeavor. The erudite practitioners of mathematical astrology, which correspond to my own definition of munajjim in this dissertation, could easily be assumed as learned individuals in all branches of the al-‘ulūm al-riyāḍīyya. Yet being an arduous student of hay’a texts does not always make one a munajjim, not because those who were conversant in ‘ilm al-hay’a were unable to make astrological calculations, but because many a time some of them remained aloof from the interpretive astrological practice. For instance among those ten groups that Abū Ma‘shar criticizes on account of their negative perceptions of astrology, one particular group was composed of learned people, who studied the heavens (qawm naẓarū fī al-‘ilm al-kullī, a’nī fī ‘ilm al-aflāk wa-ḥalāthāhā) but who believed that “the planets have no indications for the things that come to be in this world.”

One of the striking aspects of the surviving Ottoman taqwīms is that the munajjims usually cite which particular zij they consulted to make their celestial calculations before casting and interpreting their annual or occasional horoscopes. A close examination of the zijes explicitly quoted in the extant fifteenth- and sixteenth-century taqwīms clearly reveals that the three zijes most preferred in the Ottoman milieu up until the 1570s were produced in the post-thirteenth

26 In expressing the urgency of the patronage of rulers, munajjims often refer to the financial difficulty of possessing large astronomical instruments without the support of the sovereigns. See for instance Rukn al-Āmulī’s Panjāh Bāb or the Risāle-i ʿilsmāt attributed to Ibn Kemāl, already discussed in the first chapter. On the use of instruments for astrological purposes, in addition to Josep Casulleras’s work cited above, also see: Josefine Rodrigues Arribas, “Medieval Jews and Medieval Astrolabes: Where, Why, How, and What for?” in Time, Astronomy, and Calendars in the Jewish Tradition, ed. Sacha Stern and Charles Burnett (Leiden: Brill, 2013), 221-272.

century Persianate East as the fruits of systematic observation programs: the Ilkhanid tables (Zīj-i Īlkhānī) of Naṣīr al-Dīn Ṭūsī, the Testified Ilkhanid tables (Zīj al-muḥaqqaq al-sulṭānī) of Shams al-Dīn Muḥammad Wābkanawī, and the Ulugh Beg tables (Zīj-i Jadīd-i Gurgānī or Zīj-i Ulugh Beg).  

We have a limited number of surviving taqwīms survived from the pre-1490s and those extant ones rarely cite the name of the zīj utilized. Among approximately ten taqwīms from the period that have fully or partially come down to us, only two of them have explicit references to a specific zīj. The taqwīms of the years 1438 and 1468 cite al-Zīj al-Shāmil that Edward Kennedy defines in his comprehensive list of astronomical tables as an anonymous work, though the author has greatly adopted the parameters of Abū al-Watāʿ al-Būzjānī (d. ca. 970) and his collaborators in the al-Zīj al-Wādiḥ. From 1489 to 1510 we have around 30 taqwīms, and based upon the evidence gleaned from these texts, Shams al-Dīn Wābkanawī’s “Testified Ilkhanid tables” (Zīj al-muḥaqqaq al-sulṭānī) seems to have dominated the contemporary setting, as 16 out of 30 taqwīms from the period were based upon it. Nine taqwīms at the time made use of the Ulugh Beg tables, and only two of them preferred the original Ilkhanid tables. Among the remaining three taqwīms from the period, two of them do not specify the zīj they used but the taqwīm produced in the year 1489 by Khiṭābī, about whom more details will be provided in chapter three, was compiled on the basis of his own master Rukn al-Dīn Āmuli’s Zīj-i Jāmiʿ-i

28 According to Aydın Sayılı, after Ṭūsī’s death in 1274, the astral experts at the Maragha Observatory, including Aṣīl al-dīn Ḥasan, kept working on the new editions of the Zīj-i I lkānī. Therefore, some of the zīj̄es cited in the Ottoman taqwīms as the Zīj-i muḥaqqaq-i Īlkānī might be indeed referring to the different editions of the Ilkhanid tables rather than Wābkanawī’s work.  
30 See fn. 26.
From the 1510s until the late-sixteenth century—when the most famed Ottoman astral expert of all times, Taqī al-dīn prepared novel tables on the basis of a limited observation program in the newly established Istanbul observatory—practicing Ottoman munajjims almost exclusively utilized and cited the Ulugh Beg tables. According to the data extracted from surviving copies of taqwīms, around thirty-seven extant copies descended from the period 1511 and 1588, twenty-three of them were evidently compiled on the basis of the Ulugh Beg tables, whereas Wābkanawī’s tables were favored only by five. The earliest reference to the data produced in the brief life of the Istanbul observatory by Taqī al-dīn and his collaborators is in the taqwīm produced for the year 1573. As the reference to this zīj reads ("Zīc-i cedīd-i muḥakkak-ı mudakkak-ı Saʿeddīn"), the entire project seems to have been referred to at the time by the name of its primary patron, Saʿeddīn, the private mentor of sultan Murād III (r. 1574-1595). As discussed in greater detail in the first chapter, the available literature on the zījes has barely discussed the practical astrological purposes to which the tables were put. Although leading historians of science like Edward Kennedy and David King definitely point in their

31 More information on Khiṭābī is available in chapter 3.
32 For the observation program conducted and the zījes produced by Taqī al-Dīn and his collaborators in the Istanbul observatory that could operate only for a few years in the 1570s, see Sayılı, “Alaaddin Mansur’un İstanbul Rasathanesi Hakkındaki Şiirleri,” Belleten 20 (1956), 411-84; idem., The Observatory in Islam, 289-305; Sevim Tekeli, “Meçhul bir Yazarın İstanbul Rasathanesinin Âletlerini Tasvirini Veren Âlât-ı Rasadiye li Zic-i Şehinşahiye adlı makalesi,” Araştırma 1 (1963), 71-122; Süheyl Ünver, İstanbul Rasathanesi (Ankara: TTK, 1969); Remzi Demir; Takiyüddin ’de Matematik ve Astronomi: Cerideti‘d-dürer ve harideti‘l-fiker üzerine bir Înceleme (Ankara: Atatürk Kültür Merkezi Başkanlığı, 2000); Mustafa Kaçar, M. Şinasi Acar ve Atılla Bir (ed.), XVI. Yüzyıl Astronomu Takiyüddin’in Gözlem Araçları (İstanbul: İş Bankası Kültür Yayınları, 2011).
33 According to Shahinshâhnâme of Seyyid Lokmān, urād III’s court historiographer’ Taqī al-dīn’s request to build an observatory and thus revise available celestial data was brought to the attention of the sultan by none other than Saʿeddīn. See Sayılı, The Observatory in Islam, 291.
studies to the contents of *zījes* that are particularly related to astrological practice, they cannot help but say “there is precious little evidence how these works were used in practice.” In this regard, the surviving Ottoman *taqwīms* provide that “precious little evidence” on the deployment of *zījes* for astrological purposes.

It is, however, difficult for a non-historian of science to fully reconstruct the ways *munajjims* deployed *zījes* when they made necessary celestial calculations for computing the horoscope of a given time for a given locality. While it is obvious that practicing *munajjims* had to consult the tables that tabulate the detailed celestial data and parameters for the mean motions of planets in sexagesimal numbers, they do not go into the essential details about the particularities of this operation in their writings. The standard phrase they use in the surviving *taqwīms* reads that they “computed” (*istikhrāj*) the planetary positions at the time (of the year-transfer) according to a certain *zīj* (*bi-mūjab-I zīj-...*). The explicit reference to the *zīj* is also repeated in the section where the *munajjim* calculates the solar and/or lunar eclipse that he expects to occur in the upcoming year.

In his yet-unpublished study on the mathematics of Islamic astrology, Benno Van Dalen

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35 Anthropological studies on the working methods of modern practicing astrologers also reveal that there are two distinct phases in their operation, one technical and the other interpretive. While they use certain tools and methods to make necessary calculations, they say that when it comes to interpreting the chart of the querent, certain metaphysical issues are at stake. As one of the interviewed astrologers says, “much of what we do for a client has nothing to do with the specific configuration we are looking at, but rather, with the fact that the chart, and ultimately God or gods through the patterns of the chart, affirms the right of the person to be what he or she is.” See Darrelyn Gunzburg, “How do Astrologers Read Charts?” in *Astrologies: Plurality and Diversity*, ed. by Nicholas Campion and Liz Greene (Ceredigion: Sophia Centre Press, University of Wales, 2011), 181-200.
outlines the methods by which munajjims in the Islamic past could compute the planetary positions and data in horoscopes. As Van Dalen demonstrates, the computation of the true longitudes of planets (taqwīm al-kawākib) lies at the center of every astrological activity. In order to calculate the longitudes of planets at the desired moment, munajjims had to consult the tables in zijes for the mean motions and equations of each planet. These equations are complex trigonometric functions and their calculation requires frequent recourses to sine tables, multiplication, and division. Apart from computing the true longitudes of planets, another crucial method used for astrological calculations was computing the position of the ascendant (ṯāliʿ, pl. ṭawāliʿ) at a given time. According to Van Dalen’s study, munajjims often used the oblique ascension functions (maṯāliʿ al-burūj) to calculate the ascendant. While many zijes include maṯāliʿ al-burūj tables, the treatises on some astronomical instruments also provide information on how to calculate these oblique ascension functions as a step toward computing the ascendant.

After the degree of the ascendant is determined, which also marks the beginning of the First astrological house (Arabic: bayt, pl. buyūt; Persian: khāna), the Seventh—immediately opposite one— is also established as the Descendant. Then are determined the other two “pivots” (waṭad), the upper Mid-Heaven (the Medium Coeli, or literally the middle of the sky) and the lower Mid-Heaven (the Imum Coeli), former corresponding to the tenth house and the latter the fourth house.

Once all the twelve astrological houses are determined, the horoscope becomes ready to be interpreted astrologically. Each astrological house is associated with certain aspects of life.

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36 See Benno Van Dalen, “An Introduction to the Mathematics of Islamic Astronomy and Astrology” (Unpublished paper). I am grateful to Benno Van Dalen for sharing his unpublished work with me.
The first House is associated with the personality and demeanour of the native (or the individual for whom a horoscope is cast), the second describes material goods and financial matters, the third concerns the siblings and short trips, and so on. The houses are not only influenced by the Signs passing through them, but also by the planets associated with each sign through a complex system of Lords/Rulers (ṣāhib), Exaltations (sharaf), Terms (ḥadd), Triplicities (muthallatha), or Decans (Wajh).37 These parameters can also be determined from astrological tables.

We should note here that not all extant zījes that Kennedy, King, Samsó, and Van Dalen surveyed were products of detailed and systematic observation programs conducted in observatories. Therefore they were not identical in terms of their scope, precision, number of tables and parameters. However, the accuracy of the celestial data and planetary parameters like the mean motions of planets is intimately related to the quality and scope of the observational program preceding the preparation of tables. To update and correct imprecise celestial data and parameters was always the stated reason for the construction of a new observatory that would ideally house more sizeable instruments and conduct a longer observation program. Precision was evaluated at the time based upon the greater size of the tools, and a thirty-year observation program was deemed required for a fuller assessment and computation of the motions of planets. Practicing munajjims often confronted inconsistencies between the calculated times of certain phenomenon such as eclipses or conjunctions, and personally observed values. Such discrepancies prompted new generations of astral experts to run a more accurate observational program with the financial support of the ruling elites. The history of making and unmaking of observatories in the post-thirteenth century Turko-Persian politico-cultural context presents a

perfect picture of the real functions of observatories vis-à-vis the professional needs of professional *munajjims* to improve available planetary data. To better understand and substantiate the problems underlying the inaccurate celestial data, it is worth quoting fully here Wābkanawī’s criticism of the *Zīj-i Īlkhānī*:

“Therefore, the positions of planets calculated on the basis of the *zījes* which are fashionable and current among people in this day do not agree with the observed positions of the planets. Because (in the case of) those great men who constructed those Tables, despite their perfect knowledge and abundant properties and the order of the king, their life failed them to attempt to complete (i.e. they died before completing) those important affairs. For this reason, as the occasion arose, they appealed to (the results of) the old observations; and in the course of time, those necessary fractions added up to integers. And (as a result), notable divergences in the positions of the planets have appeared to such an extent that in the case of the conjunctions of the two superior planets (i.e. Jupiter and Saturn)—on which the world’s commandments depend, at the two times when they were in conjunction with each other, some obvious divergences were observed. For example, in the year 684 H [1285 in Common Era], the conjunction took place in the ninth degree of Aquarius (9°). The difference between the calculated (time of the conjunction) based on the *zīj* that is the most famous and reliable in these regions as well as in common use among people (i.e. the Ilkhanid Tables) and the (time when it was) observed was close to fifteen days. I mean, according to that *zīj*, the conjunction should have occurred in the ninth hour of daylight on Wednesday, the twentieth (day) of (the month) Shawwāl in that year (19 December 1285), but according to observation, it took place on the night of the fifth day of the month Dhu al-Qu‘da (1 January 1286). Again, according to the same *zīj*, in the months of the year 705 H, the conjunction should have taken place at the end of Libra (29°), but according to the observation, it occurred during daylight on Friday, the thirteenth day of the Jumādā al-Ākhir (31 December 1305) in the second degree of Scorpio (2°). There was a difference between the calculated (time) and the observed (time) of about eighteen days, and the degree of conjunction, *juzw-i qirān*, fell under another sign. Since then, around that date, they (i.e. Saturn and Jupiter) formed two other conjunctions, which (the calculations) based on that *zīj* did not predict.”

The *munajjims* active in the late-fifteenth and early-sixteenth century Ottoman milieu seem to have been aware of the problems of the *Zīj-i Īlkhānī*, as they rather preferred the revised tables of Wābkanawī before they eventually opted for the Ulugh Beg tables. But even the Ulugh Beg tables were not free from deficiencies, and throughout the sixteenth century certain practicing astral experts appealed to the court and attempted to persuade the reigning sultans to establish an observatory. The talismanic treatise attributed to Ibn Kemāl, mentioned in the first chapter, clearly reveals that long before Taqī al-dīn approached Murād III (r. 1574-1595) and his chief adviser Saʿuddīn in the late sixteenth century, some of the practitioners issued demands for a systematic observational program in the Ottoman capital to correct the available planetary data.\(^{39}\)

Besides the ability to extract the necessary celestial data out of *zījes*, *munajjims* also had to have a sound knowledge of the nature and inclinations of planets, signs, astrological houses, and planetary aspects. Although there were several alternative textbooks and *summae* of astrological principles circulating at the time, the particular texts and names quoted heavily in the Ottoman *taqwīms* and a few surviving horoscopes—whenever there emerges a need to justify a specific celestial indication—could be grouped as follows:

i) *Kitāb al-thamara* (known in Latin as *Centiloquium*): One hundred astrological aphorisms attributed to Ptolemy but originally composed in Arabic in the early tenth century by a certain Abū Jaʿfar Aḥmad b. Yūsuf (d. ca. 944). Later translated into Persian by different parties including Naṣīr al-Dīn Ṭūsī. It is mostly through the Persian

\(^{39}\) SK Esad Efendi Ms. 3782, 89a. See fn. 37 in Chapter 1.
translation of Ṭūsī that the Ottoman munajjims adopted the text, though a few experts were able to quote certain aphorisms in the original Arabic.\textsuperscript{40} As the simplified and easily practicable version of Ptolemy’s major astrological work \textit{Tetrabiblos}, \textit{Kitāb al-thamara} became a standard textbook for astrological instruction, especially in the fields of birth horoscopes and interrogations.\textsuperscript{41}

ii) Naṣīr al-Dīn Ṭūsī’s \textit{Ṣī faṣl} or \textit{Mukhtasar dar maʿrifat-i taqvīm}: a short textbook in Persian that informs in brief thirty chapters the students and general reading public about the use of sexagesimal numbers, general characteristics of planets, signs, and the indications of planetary aspects. The text was one of the widely copied scientific works of the time, as there is rich manuscript evidence of its circulation in Anatolian and Iranian lands from late thirteenth century onwards. It was translated into Turkish as early as the late fourteenth century by Aḥmed-i Dāʾī (d. later than 1421).\textsuperscript{42} Some of the names from the Fenārī Circle of the early fifteenth-century, such as Ṭūsī’s Persian translation of al-Thamara, see \textit{Sharḥ-i Ṣamarah-i Baṭlanyūs dar aḥkām-i nujūm}, ed. Khalīl Akhāvān Zanjānī (Tehran: Āyīnah-i Mīrāṣ, 1999).


\textsuperscript{41} In the eyes of noted intellectual and literary figures in the medieval Islam such as al-Tawḥīdī (d. 1023), \textit{Kitāb al-thamara} is a kind of book all learned men should “absorb themselves in its reading.” Quoted in Richard Lemay, “Religion vs Science in Islam. The Medieval Debate around Astrology,” \textit{Oriente Moderno} 19/3 (2000), 573.

\textsuperscript{42} Ahmed-i Dāʾī, \textit{Muhtasar fi ilm el-tencim ve marifet el-takvim (risale-i si faṣl)}, ed. T. N. Gencan and M. Dizer (İstanbul: Boğaziçi Üniversitesi Kandilli Rasathanesi, 1984).

\textsuperscript{43} \textit{OALT}, v. 1 (İstanbul: İslâm Tarih, Sanat ve Kültür Araştırmaları Merkezi, 1997), 22-24.

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iii) Kūshyār ibn Labbān (d. 1029) and his *Mujmal al-uṣūl fī aḥkām al-nujūm* (*Compendium of Principles in Astrology*, also called *al-Mudkhal fī ṣināʿat aḥkām al-nujūm*): a detailed textbook, imitating Ptolemy’s *Tetrabiblos*, teaching in four major chapters (*maqāla*) the fundamental elements of astrology and methods for practicing its different branches such as Genethlialogy/horoscopic astrology and Catachetic/electional astrology.\(^\text{44}\)

iv) Abū Rayḥān al-Bīrūnī and his *Kitāb al-taḥfīm li-awā’ il ṣināʿat al-tanjīm* (*Book of Instruction in the Elements of the Art of Astrology*): a compendium of astronomical and astrological knowledge in both Arabic and Persian renditions, necessary for establishing the precise technique and terminology for the practice of judicial astrology.\(^\text{45}\)

v) Abū Maʿṣar al-Balkhī (d. ca. 886): Ottoman *munajjims* often cite his name in their *taqwīms* and horoscopes, but they do not explicitly quote any of his well-known treatises such as *Kitāb al-mudkhal al-kabīr* (*General Introduction to Astrology*), *Kitāb al-milal wa’l-duwal* (*Book on Religions and Dynasties*), or *Kitāb al-ulūf* (*Book of Thousands*). Nor are these titles available in the library catalog of the Ottoman palace or the inventories of other private collections prepared in sixteenth century.\(^\text{46}\)

\(^{44}\) *Kūshyār ibn Labbān’s Introduction to Astrology*, ed. Michio Yano (Tokyo: Tokyo University of Foreign Studies, 1997).


\(^{46}\) For Abū Maʿṣar’s biography and works, see David Pingree, “Abū Maʿṣar al-Balkhī, Jaʿfar ibn Muḥammad,” in *Dictionary of Scientific Biography*, v. 1, 32-39. Many of his extant works have been translated and published as critical editions. See David Pingree, *The Thousands of Abu*
vi) Abū’l-Maḥāmīd b. Maš’ūd al-Ghaznawī (fl. 1170) and his Kifāyat al-taʿlīm fī šināʿat al-tanjīm ( Sufficiency of Learning in the Art of Astrology): One of the most popular textbooks among the Ottoman munajjims which, in the manner of Bīrūnī’s Tafhīm, brings together in Persian two major bodies (jins) of necessary knowledge: ‘ilm-i hay’a and ‘ilm-i aḥkām. Each body is divided into further chapters and subsections.47

vii) ‘Alā’ al-Dīn ‘Alī-Shāh b. Muḥammad b. Qāsim al-Khawārazmī al-Bukhārī and his Kitāb Aqmār va Ashjār ār Hkām-i Nujūm (also known as Thamarat al-shajarah): composed of five shajarahs written in Persian, each touching upon a particular aspect of judicial astrology such as the horoscope of the year transfer (dar aḥkām-i ṭālī’-i ṭahvīl-i sāl), horoscope of birth (dar aḥkām-i ṭālī’-hā-yi mavlūd), and special methods for calculating horoscopes.48

viii) Shahmardān b. Abī’l-Khayr Rāzī (d. later than 1072) and his Rawdat al-munajjīmīn: an extensive introduction in Persian to astrological rules written in fifteen


47 Not much is known about the life of Ghaznawī. For the copies of the text see C. A. Storey, Persian Literature: A Bio-Bibliographical Survey, v. 2, p. 1 (London: Luzac, 1927), 46-47. Ghaznawī says in the introduction to his manual that the aim of his volume is to make readers acquainted with the knowledge on the configuration of the celestial spheres and corresponding astrological indications. British Museum Or. 11630, 1b: “garaź-i kitāb shinākhṭan-i hay’at va aḥkām ast.”

maqālas for beginners by a secretary (dabīr).\(^{49}\)

As for those titles on more specific branches of astrology like interrogations (masāʾil) and elections (ikhtiyārāt), one should also mention the Kitāb al-masāʾil of Yaʿqūb b. ʿAlī al-Qaṣrānī. Unfortunately not much is known about him, although later sources including Fakhr al-Dīn Rāzī cite him among other astrological authorities from the early Abbasid period, including Abū Maʿshar, ʿUmar b. al-Farrukhān al-Ṭabarī (d. 815-6), or Sahl b. Bishr (fl. 821-850).\(^{50}\) His compilation on horary astrology (masāʾil), which aims at treating a wide array of questions of a querent by interpreting the astrological significance of the time that particular question is posed, seems to have been quite popular in the early-modern Ottoman realm. Mīrim Çelebi, one of the most important astral experts in the early sixteenth-century Ottoman world, about whom more information will be provided next chapter, says in his treatise on horary astrology that curious readers should consult Qaṣrānī’s compilation for further reading about the topic.\(^{51}\) In addition to Qaṣrānī, Fakhr al-Dīn Rāzī’s influential work on electoral astrology, al-Ikhtiyārāt al-ʿalāʾiyya fī aḥkām al-samāwiyya, of which Rāzī himself prepared both Arabic and Persian renditions during


\(^{50}\) The canon used by Rāzī consists of the works of Ptolemy, Vettius Valens (d. ca 175), Abū Maʿshar (d. 886), Dorothius of Sidon (d. ca 75), ʿUmar b. al-Farrukhān (d. 815-6), al-Sijzī (d. ca 1020), al-Qaṣrānī, Abū Jaʿfar Muḥammad b. Ayyūb al-Ṭabarī (ninth-tenth century A.D.), Kūshyār (d. 1029), and Sahl ibn Bishr (d. ca 845). See TSMK Revan Ms. 1705, 2a: “Pas kitābḥa-yi ustādān chūn Baṭlāmyūs va Vālīs va Abūʾl-Maʿshar al-Balkhī va Yaʿqūb b. ʿAlī al-Qaṣrānī va Muḥammad b. Ayyūb al-Ṭabarī va Kūshyār ibn Labbān ba-shahrī al-’Brien va Sahl bin Bishr jam’ kardam.”

\(^{51}\) SK Bağdatlı Vehbi Ms. 2005, 47b: “in qadr dar ma’rifat-i aḥkām kifāyat bāshad va agar kasī ziyada az in khāhad ba-mukhaṣṣar-i Qaṣrānī ki bi-masāʾil-i Qaṣrānī mashūr ast murāja’at namāyad.”
his own lifetime, were also often cited by munajjims in the late-fifteenth and early-sixteenth century Ottoman realm.

The inventory of authoritative sources relies mostly upon the detailed examination of the exact references in extant Ottoman taqwīms, horoscopes, and a few surviving textbooks written by indigenous Ottoman astral experts from the period in question. Unfortunately, in none of the authentic writings of Ottoman munajjims at the time can one easily find a ready-made bibliography of useful sources.\(^{52}\) Therefore I had to distill information from surviving astrological materials of the time and prepare a tentative list of sources frequently cited in contemporary astrological writings. One may refer here to Taşköprızade’s encyclopedic work in which he lists the useful texts for different branches of astrological practice but since he repeats almost verbatim the discussion in the encyclopedic work of the Mamluk encyclopedist Ibn al-Akfānī (d. 1348) instead of representing the exact preferences of his own time and realm, his inventory does not always overlap with the actual references of munajjims in the Ottoman milieu.

Another important source for our purposes here is the inventory of the palace library, which was compiled by the chief librarian ʿĀṭūfī in 1502-3 to list the names of around 5,700

\(^{52}\) In his introduction to the al-Ikhtiyārāt al-ʿalāʾiyya fī ahkām al-samāwiyya, Fakhr al-Dīn Rāzī quotes a handful of texts that he personally utilized in writing his own work. It is difficult to find in the authentic writings of Ottoman munajjims anything similar to Rāzī’s bibliographical enterprise. The canon used by Rāzī consists of the works of Ptolemy, Vettius Valens (d. ca 175), Abū Maʾshar (d. 886), Dorothius of Sidon (d. ca 75), ʿUmar b. al-Farrukhān (d. 815-6), al-Sijzī (d. ca 1020), al-Qaṣrānī, Abū Jaʿfar Muḥammad b. Ayyūb al-Ṭabarī (ninth-tenth century A.D.), Kūshyār (d. 1029), and Sahl ibn Bishr (d. ca 845). See TSMK Revan Ms. 1705, 2a: “Pas kitābā-yi ustādān chūn Baṭlanyūs va Vālīs va Abūʾl-Maʾshar al-Balkhī va Yaʾqūb b. ʿAlī al-Qaṣrānī va Muḥammad b. Ayyūb al-Ṭabarī va Kūshyār ibn Labbān ba-shahrī al-Jīlī va Sahl bin Bishr jamʾ kardam.”
volumes and 7,200 titles in various branches of knowledge housed in the imperial treasury.\footnote{Library of the Hungarian Academy of Sciences, Ms. Török F 59.}

ʿĀṭūfī’s catalogue is replete with treatises and textbooks on astrological principles as well as astronomical tables and instruments, and the relevant section of the inventory is given in full as Appendix B to this dissertation. Even a cursory look at the list of items available in the imperial treasury will demonstrate that the inventory perfectly reflects the trends of the munajjims active in the Ottoman realm. First of all, the collection of zījes in the palace library neatly represents the general leanings among practicing munajjims toward the post-Maragha zīj tradition in Persian. Among the twenty-five copies of zījes and their commentaries listed in ʿĀṭūfī’s inventory—with the exception of the two copies of al-Bīrūnī’s al-Qānūn al-Masʿūdī, which can indeed be regarded as a zīj—there are five copies of Zīj-i Īlkhānī along with another five copies of Nisābūrī’s Kashf-i ḥaqāʾiq and two copies of Jamshīd al-Kāshī’s Zīj-i khāqānī fi takmīl-i Zīj-i Īlkhānī, both of which were expositions of the Ilkhanid tables. The catalogu also includes five copies of the Zīj-i Ulugh Beg together with two copies of ʿAlī Qūshjī’s commentary on the Ulugh Beg tables and one copy of that of Mīrim Çelebi.

As for manuals and textbooks on astrological rules, Ṭūsī’s Sī faṣl seems to have enjoyed most popularity. There are, by my count, 13 copies of the text along with later commentaries, including Khiṭābī’s lengthy Muwaddih al-rusūm fi ʿilm al-nujūm, which he presented to Meḥmed II in December 1479. Next comes the Kitāb al-thamara with seven copies (one cited in the tārīkh section of the inventory), almost exclusively in Persian. That the available Thamara copies in the palace library were written in Persian provides yet another strong proof for the ascendancy of the Persian astral tradition within Ottoman circles. As for the books of Abū Maʿshar, there are at
least five titles recorded with explicit reference to his name, but as their titles are too generic (e.g. *Muntakhab Kitāb Abī Ma’shar fī ahkām al-nujūm*), it is difficult to establish which Abū Ma’shar texts were in question. In addition to Ṭūsī, (Pseudo-) Ptolemy, and Abū Ma’shar, the library catalogue has at least five copies of the *Kitāb al-tafhīm* of al-Bīrūnī and the *Mujmal al-usūl* of Kūshyār. Ghaznawī’s *Kifāya* is also cited at least for two times.

An important aspect of the collection is that since the imperial library was accessible to the court munajjims at the time, the holdings at the treasury not only reflect but also likely shaped the scholarly preferences of practicing munajjims. For instance through the end of Bāyezīd II’s reign, one of the court munajjims approached the sultan in an undated, anonymous Persian petition, asking to gain access to some of the items in the treasury (*khizāne*). The requested items include a sumptuous astrolabe (*usṭūrūlāb-tām*), the Ulugh Beg tables (*Zīj-i Ulugh Beg*), *Kitāb-i Majisṭī* of Naṣīr al-dīn Ṭūsī, and the horoscope of the sultan (*ṭāli’-i ḥaẓret-i ‘ālem-penāhī*) along with those of his sons, Kūrkud and Aḥmed.54 The anonymous munajim also reassures the sultan that if the horoscopes are not currently available, he could produce (new) ones for each as long as he is informed of the exact birth-dates of the sultan and his sons.

Interestingly enough, the extant probate inventories of some of the deceased court munajjims from much later periods also corroborate that the books deemed important by astral experts in the late fifteenth and the first half of the sixteenth century still had greater influence in the scholarly horizons of practitioners in the following centuries. For example, in the estates of

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54 TSMA E. 10159/6: “*Kitāb-i zīj-i Ulugh Bīgi va kitāb-i Majisṭī va usṭūrūlāb-tām bā-ṭāli’-i ḥaẓrat-i ‘ālam-penāhī bā-ṭāli’-i mawlūd-i sulṭān Qurkhut va ṭāli’-i mawlūd-i sulṭān Aḥmad dar khizāna būda amr fardāyand ki baḏīn kāmīna bašadhand va agar ṭāli’-hā ma lūm nabāshad tārikh-ī vilādāthā rasālīm namāyand tā ba’d az istikhrāj kāyfiyāt-i īlāli’-i har yak rā chūnāncha az dalāi-l-i nujūmī ma lūm shavad ba-‘arż rasānīda shavad.”
the deceased müneccimbaşı Halil Efendi (d. 1773) are found at least two copies of the Zīj-i Ulugh Beg, Abū Maʿṣar’s ḥākām treatises, al-Bīrūnī’s Taḥḥīm, Ghaznawī’s Kifāyat, ‘Alī-Šāh’s Aṣmār va Ashjār, Turkish translation of al-Qaṣrānī’s Kitāb al-Masā’il (“Terceme-i Qaṣrānī”) along with several horoscopes (ṭāliʿ-i mevlūd) and unspecified works on preparing taqwīms (Aḥkām-i kulliya fī al-taqwīm and Īstikhrāj al-taqwīm min al-zīj). In a similar vein, the probate inventory of the deceased ser-müneccim Mūsâzâde Muḥammed Ubeydollâh Efendi (d. 1782) lists among his books at least three copies of the Zīj-i Ulugh Beg, two copies of Mīrim Çelebi’s commentary on the Ulugh Beg tables, one copy of Nīsâbūrī’s commentary on the Ilkhanid tables, two copies of the commentary on Ptolemy’s Tetrabiblos (Sharḥ-i arbaʿa maqālāt), Ghaznawī’s Kifāyat, at least two copies of Qaṣrānī’s Kitāb al-masāʾil, Alī-Šāh’s Aṣmār va ashjār, Kūshyār’s Mujmal al-uṣūl, and several unspecified treatises on birth horoscopy (aḥkām-i mevālīd).

Even in the private collection of the nineteenth century chief munajjim al-Sayyid Muḥammed Saʿdullâh Efendi (d. 1848) is there one copy of an unspecified commentary on the Zīj-i Ulugh Beg. The books possessed by the late-eighteenth and early nineteenth-century court munajjims not only included these cited sources but also works on ‘ilm al-hay’a (like Tahrīr al-Majisṭī of Ṭūsī or Mecmūʿa-i Chaghmīnī), ‘ilm al-raml (including one particular text attributed to Ṭūsī), ‘ilm al-jifr, and other examples of the zīj tradition including the zīj of Ibn al-Shāṭir and more recent European achievements (terceme-i zīj-i Frangī and sometimes specifically recorded

55 D. BŞM. MHF. 55:34. I would like to thank Hakan Kırkoğlu for informing me of the presence of such an inventory in the archives.
56 KA 502, 21b.
57 KA 1650, 52b.
as *Zīj-i Lālānī*). All in all, these probate inventories are useful to portray the extent of the canonization of astrologically valid knowledge in the early-modern Ottoman intellectual context.

II. 4. **The Venues of Training on Astrologically Valid Knowledge**

How and where could a would-be *munajjīm* get a good acquaintance with any set of these texts listed above? In the absence of a running observatory in the Ottoman world in the late fifteenth and first half of the sixteenth century, were there any institutional means of vocational training? Could a student learn astrologically valid knowledge in a *madrasa*? What role did the offices of *muwaqqit* and court *munajjīms* play in the transmission of astrologically valid knowledge down the generations?

The observatories that were sporadically founded in the medieval Islamic domains, especially in the eastern lands, provided the most important institutional framework for bringing together experts with varying specializations in the mathematical-astral sciences and spurred the accumulation of useful texts in a particular location. From the reign of al-Maʾmūn onwards, and accelerating especially in the post-Mongol era, the eastern Islamic lands witnessed the

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58 Jérôme Lalande’s (d. 1807) tables started to be used in the Ottoman realm from the late eighteenth century onwards, though some of the Ottoman court *munajjīms* were already familiar with contemporary European astronomy and astrology in the seventeenth century. Mūneccimbaşı Muḥammad b. Ṭali (d. 1631) says in the introduction to his derivative textbook on astrological principles that he prepared it on the basis of Arabic, Persian, and European sources. See Kandilli Rasathanesi Library Ms. 371, 1b: “[B]uyurdular ki bize aḥkām-ı nücūmda aḥkām-ı ‘āleme müte’allīk ve aḥkām-ı ṭāli’e müttefik bir Türkî kitâb terceme olunmasıçin emr-i şerifleri sâdîr olmağın bu fākîr-i pûr-takṣîr Muḥammed b. Ṭali re’is el-mûneccimîn daḫî ‘Arabic ve Fârsî ve Frengî kitâbların zûbdelerin cem’ ve tahrîr idub...”

For the curious story of the Turkish translation of Noël Durret’s *Novae motuum caelestium ephemerides Richelianae* by İbrahim Efendi al-Zigetvari Tezkireci in the year 1660, see Avner Ben-Zaken, “The heavens of the sky and the heavens of the heart: the Ottoman cultural context for the introduction of post-Copernican astronomy,” *British Society for the History of Science* 37/1 (2004), 1-28.
establishment—and subsequent demolition—of a number of observatories. As already discussed earlier with respect to the production of zijes, the fundamental purpose of constructing a new observatory and running a fresh observational program was to rectify existing tables indispensable for astrological practice. Yet due to irregular financial support, tumultuous political circumstances, and social and religious tensions vis-à-vis the moral licitness of practicing astrology, many of the established observatories operated only for a limited period of time. One exception is the Maragha observatory, which, after its construction in 1259, was able to survive until 1316 thanks mostly to its being funded by more stable waqf revenues.

Observatories provided a convenient space to facilitate private instruction and apprenticeship between experienced experts and aspiring students of celestial knowledge, some of whom were connected by family ties. Some of these institutions were also accompanied by madrasas where different matters related to the al-ʿulūm al-riyāḍiya were evidently instructed. Thanks to the surviving letters of Jamshīd al-Kāshī and the ijāza given to Fathullāh Shirvānī (d.

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60 For the exceptional status of the Maragha observatory see Sayılı, The Observatory in Islam, 207-223.

61 The most prominent example seems to be the al-Kāshī family, different members of which served different courts in the Timurid realm. Maḥmūd b. Yaḥyā b. al-Ḥasan al-Kāshī named (al-mulaqqab bih) Ṣmād al-munajjim was the author of the famous horoscope of Mīrzā Iskandar b. ʿUmar Shaykh prepared in 1411. Another horoscope, hitherto unknown, was apparently produced on 15 Muḥarram 822/February 11, 1419 for Mīrzā Rustam b. ʿUmar Shaykh. The munajjim authoring this horoscope is a certain Yaḥyā b. Ṣmād b. Yaḥyā al-munajjim al-Kāshī, who is probably the son of the munajjim that prepared Mīrzā Iskandar’s horoscope. See Huntington Library Ms. HM71897. I am grateful to Evrim Binbaş for informing me about the text and generously sharing with me the images of the manuscript. The famous astral expert in the Samarqand observatory, Jamshīd al-Kāshī b. Masʿūd b. Maḥmūd al-Kāshī also seems to be related to the previous two. Fatema Keshaverz argues that Jamshīd al-Kāshī was the grandson of Ṣmād al-munajjim, the author of Iskandar’s horoscope.
1486) by his master Qâdîzâda-i Rûmî, we have substantial evidence to shed light upon the
instruction of theoretical as well as practical celestial knowledge in Samarqand observatory and
the accompanying madrasas. While none of these sources specifically refer to the teaching of a
dedicated astrological textbook in the classroom, Jamshîd al-Kâshî’s letters provide evidence that
the students, among whom, says al-Kâshî, were plenty of munajjims and mustakhrijes (i.e.,
calculators), engaged in the use of the zîj and addressed problems with respect to calculating the
degree of the ascendant (tâlî’):

“Another day, when arriving at the school, His Majesty [Ulugh Beg] had met a student at
the door, holding a book. He [i.e., the King] had asked him what book it was, [The
student,] kissing the book, had presented it [to his Majesty]. Opening the book, [His
Majesty] had chanced on a chapter [entitled] “On the curiosities of the astrolabe,”
[beginning with this problem]: [Let us suppose that] the Sun is, e.g., in 10 degrees of
Aquarius, with a certain altitude, and the ascendant of time is a certain degree [of the
ecliptic]; then [the ascendant of the time when] its [i.e. the Sun’s] altitude [is the
maximum altitude of the ecliptic at that moment] is a quadrant [in advance of the Sun’s
position], i.e., in 10 degrees of Taurus. After one month, the Sun having described one
sign [of the Zodiac], while having the same altitude as on that [previous] day, how could
the ascendant be exactly the same as it was in that day? After having entered [the
classroom, His Majesty] had presented that problem for discussion.”

As regards to the institutional sites for the study and transmission of astrologically valid
knowledge in the late fifteenth- and early sixteenth-century Ottoman milieu in which there was
no observatory, the madrasa and mosque seem reasonable candidates. However, as it will be
demonstrated in detail below, the evidence for the instruction of astrologically valid knowledge

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62 Mohammad Bagheri, “A Newly Found Letter of Al-Kâshî on Scientific Life in Samarqand,”
Historia Mathematica 24 (1997), 245. This is one of Kâshî’s two extant letters written, according
to Bagheri, prior to the one published separately by Aydın Sayılı and Edward Kennedy. See
Edward S. Kennedy, “A Letter of Jamshîd al-Kâshî to His Father: Scientific Research and
Personalities at a Fifteenth Century Court,” Orientalia 29 (1960), 191-213; Aydın Sayılı, Uluğ
Bey ve Semerkanddeki İlim Faaliyeti Hakkında Gıyasüddin-i Kaşî’nin Mektubu: Ghiyâth al-Dîn
in these locations is so tenuous that it is difficult to propose them as established institutional structures for the production and instruction of the knowledge necessary for astrological practice.

The question with regards to teaching in madrasas of the so-called “rational” sciences (al-ʿulūm al-ʿaqliyya) and/or the “the sciences of the ancients” (ʿulūm al-awāʾil)—besides the transmitted and/or traditional sciences (al-ʿulūm al-naqlīyya)—has indeed attracted the attention of many modern scholars. This specific question is by nature tied to the broader issue of the origins and functions of the madrasa in the medieval Islamic social and intellectual world. The publication in 1981 of George Makdisi’s seminal book, *The Rise of Colleges: Institutions of Learning in Islam and the West*, engendered a new wave of scholarly interest in discussing the true place and functions of the madrasa in medieval Islamic world, although one can easily trace the vast literature on medieval madrasas much earlier.63 Makdisi’s insistence on the definition of the madrasa as a “college of law” and his strong focus on its institutional character with a strictly defined curriculum of traditional Islamic sciences were later criticized on different grounds by an array of scholars, including Jonathan Berkey, Michael Chamberlain, and Daphne Ephrat.64 While it is not the primary aim of this section to detail the individual criticisms of these revisionist


scholars, suffice it to say that Makdisi has often been criticized for his tendency to describe *madrasa* as the only means of learning and education in the medieval Islamic world. Later critics reminded Makdisi, however, that the *madrasa* was not the only form of education and knowledge transfer, and in fact, in the medieval Islamic world, *personae* were much more important than *loci*. Therefore, according to later generations of scholars, what really mattered in medieval Islamic learning was not the name of the *madrasa* whence an individual graduated but rather those of the professors (*mudarris*) under whom one studied certain books and topics.

At first glance, the revision of Makdisi’s position may seem welcome with respect to those studies tackling the question of the place of the so-called “rational” sciences in the learning regimes of medieval Islamic society. Since education was performed through more personal mechanisms and the issue at stake was what individual *mudarris*es would assign, as revisionist scholars have argued, one could then easily assume that depending on the intellectual proclivities of individual *mudarris*es and students, books and subjects on natural-philosophical and mathematical knowledge might well have been studied in *madrasas*.

The flip side of the coin, however, is the risk of reinforcing some of the established scholarly convictions, which assume that genuine interest in non-religious, “rational” sciences in the medieval Islamic world were only held by certain curious individuals in discrete episodes without any consistent institutional basis. According to this blueprint, which is also quite widespread even among the historians of science in the Islamicate context, the instruction of natural, philosophical, and mathematical sciences in the medieval Islamic world did not enjoy much scholarly and institutional recognition, and therefore, was almost always restricted to

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65 Berkey, *The transmission of knowledge in Medieval Cairo*, 23.
limited circles consisting of a few “enlightened” figures. Consequently, the shift from Makdisi’s excessive emphasis on the *madrasa* as the sole institution for the instruction of “religious” sciences to the revisionist emphasis upon the personal nature of education had no real positive impact regarding the question of the role of educational institutions in sustaining the “scientific” education in the medieval Islamic world. Not unlike George Makdisi, the revisionist scholars also do not have much to offer to the question Abdelhamid Sabra had raised earlier: “How did a significant scientific tradition maintain itself for such a long time largely outside the only stable institution of higher learning in medieval Islam?”

In the last two decades, however, several important works have been published that discuss the penetration of mathematical and astral sciences into the *madrasa* setting. In his work on Niẓām al-Dīn Nīsābūrī (d. 1328-9), the fourteenth-century polymath from the immediate circle of Naṣīr al-Dīn Ṭūsī’s student Ḥāfiz al-Dīn Shirāzī, Robert Morrison clearly demonstrates that the teaching of mathematical and celestial knowledge including *ʿilm al-hay’a* gradually penetrated into the *madrasa* curriculum in the Islamic East from the thirteenth century onwards. Likewise, Sonja Brentjes, Sally Ragep, İhsan Fazlıoğlu, and late Cevat İzgi documented on the basis of manuscript evidence that certain books on *ilm al-hay’a* and other branches of the *al-ʿulūm al-riyāḍiyya* were definitely taught in certain *madrasas* especially in the

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66 A. I. Sabra, “The Appropriation and Subsequent Naturalization of Greek Science in Medieval Islam: A Preliminary Statement,” *History of Science* 25 (1987), 234. In fact Sabra himself seems not affirmative about the institutional nature of scientific instruction, as he tends to state that institutional basis had no real significance and that the accomplishments made by Muslim scholars had no relation to place. Sabra even argues that religious institutions rather stood as obstructions to authentic scientific inquiries. See his “Situating Arabic Science: Locality Versus Essence,” *Isis* 87/4 (1996), 654-70.

post-thirteenth century world. For Ragep, Fazlıoğlu, and İzgi, the greater number of surviving copies of titles such as Chaghmīnī’s al-Mulakhkhas fī al-hay’a al-baṣīṭa or Qāḍīzāda-i Rūmī’s later commentary on Chaghmīnī’s text (Sharḥ al-mulakhkhas fī al-hay’a), some of which were even copied by mudarrises across diverse regions and periods is a strong indication that these books were transmitted through formal madrasa education. Besides such quantitative evidence and manuscript records, various other sources from the period also evince that theoretical celestial works were studied within the institutional structure of madrasas. In addition to the letters of Jamshīd al-Kāshī or the ijāza of Fathullāh Shirvānī, Taşköprızāde himself narrates in an autobiographical passage that while he was a madrasa student in the first half of the sixteenth century, he studied ‘Alī Qūshjī’s book on ‘ilm al-hay’a (Kitāb al-faṭḥiyya) at the feet of Mīrim Çelebi (d. 1525). Taşköprızāde also details in his encyclopedic work on the taxonomy of knowledge the books that should be instructed in different branches of mathematical and astral sciences to meet varying levels of pedagogical needs. As this shows, mathematical and theoretical celestial knowledge, which was not the major objective of instruction in madrasas at

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69 Cevat İzgi meticulously establishes, on the base of paratextual evidence from extant manuscripts, the names of mudarrises that copied al-Mulakhkhas fī al-hay’a al-baṣīṭa or any of its later commentaries. See especially 370-392.

70 Taşköprızāde, al-Shaqa’iṣ q al-nu’ mǎniyya, 327. More information on Mīrim Çelebi will be provided in the third chapter of this dissertation.
their very foundation around the tenth century, began to percolate into some of the established institutions from the thirteenth century onwards.

The recent scholarship on the penetration of mathematical and theoretical astral sciences into madrasas is crucial in the sense that it can save us from a historiography that gives credence to an episodic history of science or a great-men narrative in the medieval Islamicate context, which is to say a kind of historiography “based on chance and accident rather than a more plausible story of individual effort sustained within an enduring social context.”71 Yet when the question is about the instruction of a contentious subject like “astrology” in the madrasa setting, the picture is much more complicated.

It is in fact quite difficult to find strong traces of strictly astrological instruction in the madrasa setting, given the fact that the craft itself was a highly controversial one even in the eyes of its past practitioners. As we have already seen in the first chapter, even some practicing Ottoman munajjims were skeptical about the scientific premises of ḥākām al-nujūm and felt uneasy at being compelled to undertake astrological tasks. Besides such personal reservations, the institutional charters and endowment deeds (waqfiyya) administering, or at least reflecting, the contours of instruction in high-ranking madrasas also provide little to no evidence as to the instruction of astrologically valid knowledge in Ottoman institutions of higher education. For example, multiple versions of the waqfiyya of the Fatih mosque complex produced in the course of late fifteenth and early sixteenth century do not reveal that texts or subjects associated with

astrological pursuits were to be instructed in any of the eight madrasas (Sahn-ı semān). Nevertheless, some of the extant waqfiyyas make explicit references to the competence of instructors in the elusive category of the “rational sciences” (mebađī ve mukādmemāt-ı ‘akliyyāt) when they describe the qualifications to be looked for in the Sahn mudarrisēs that would teach there. Yet the insertion of the phrase “useful sciences” (‘ulūm-ı nāfi’a) implies the exclusion of astrology, given that astrology was often categorized in the classical taxonomy of sciences tradition as a worthless endeavor. In a similar vein, in the waqfiyya administering the functions and functions of the Süleymaniye complex in the mid-sixteenth century, one can find such stipulations stating that mudarrisēs that are learned in both transmitted and rational sciences will receive sixty silver akçes per diem; however, the details of the components of the rational

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In the imagination of some late sixteenth-century Ottoman learned individuals such as Muṣṭafā ‘Ālî, ‘ilm al-hay’a was taught in the Sahn- semān during the reign of Mehmed II. See Kûnhû’l-Aḥbâr, c. 2 Fatih Sultan Mehmed Devri (1451-1481), ed. by M. Hûdâ Şentürk (Ankara: TTK, 2003), 152. It is interesting to see Muṣṭafâ ‘Ālî stating that people of knowledge received much more benevolence and recognition during the time of Meḥmed II thanks to the auspicious influences of the stars at the time (ol devr-i latﬁfin niçâmı te şirâtundan). Ibid., 3.

sciences remain unspecified. Specifically in the waqfiyya of the Süleymaniye complex, which
also housed a medical school, the stipulations about the potential mudarris at the medical school
(‘ilm-i ṭbb için binan medrese-i ṭayibe) naturally refer to competence in medical
sciences. No matter how widespread the use of celestial knowledge for medical purposes was at
the time, there is no specific mention of it in the relevant section of the waqfiyya

Another institutional setting where the instruction of astrologically valid knowledge
might have taken place was the mosque, especially those grand imperial mosque complexes that
often employed personnel to perform tasks for computing time (i.e., muwaqqits) in a designated
space (i.e. muwaqqitkhâna). In the surviving waqfiyyas of both the Fatih and Süleymaniye
complexes mentioned above, a post is reserved for a muwaqqit to make the necessary temporal
calculations for daily prayer times, length of days, beginning of months, and related occasions.75
As the phraseology in the Süleymaniye waqfiyya manifests, the muwaqqit needs to be acquainted
with the generals and particulars of the “science of the stars” (sāʿir ‘ilm-i nūcūma mûteʾallık
külliyât ve cuzʿiyyet-i maʿarif ve vâkif ve ‘ārif). In return for his services, he would receive ten
silver akçe a day. Neither of these waqfiyyas, however, specifies a designated space for the
muwaqqitkhâna, though subsequent anecdotal and surviving physical evidence from other grand-
mosque complexes clearly reveal that there was often a small building adjoining the complex

75 Ibid., 34: ‘amel-i sâʿât ve mevâkit-i şalavat ve mekâdir-i şeb u rûz ve nuzûl ve ‘urûc-i
seyyârât-i şeb’a ve menâzîl-i burûc ve dekâyi̇k u durûc-i meşir-i Aftâb ve izdiyâd ve intikâs-i
mâhîtâb ve sâʿir ‘ilm-i nûcûma mûteʾallîk külliyât ve cuzʿiyyet-i maʿarif vâkif ve ʿārif ... bir
kimesne muvakkit olub evkât-i ezâmi mû ezzinlere taʿyîn idûb tenbih eyleye ... vazîfesi on akçe
ola.”
that was used by timekeepers to keep their instruments and notebooks, and make their necessary horologic calculations. In light of the allusions of later sources, we can claim that these designated small spaces were also used as meeting places where the muwaqqit could discuss with his fellows and/or would-be experts the intricacies of the science of the stars.

In the broader field of the history of science in the Islamicate context, the services of timekeepers and their instruments have been discussed almost exclusively from a mathematical and astronomical point of view. In his seminal work on the role of muwaqqits in the Mamluk era,
David King underlines that there was no single surviving astrological text from the Mamluk times, and that *muwaqqits* in large mosque complexes were not engaged in any form of astrological practice.\textsuperscript{78} Sonja Brentjes, however, later demonstrated on the basis of biographical evidence from the Mamluk era historian al-Sakhawī (d. 1497) that some of the *muwaqqits* and *mu’adhdhins* in the Mamluk world certainly undertook astrological pursuits.\textsuperscript{79} In fact, the expertise of computing “time” and “location” enjoyed by astral experts had manifold uses that range from making calculations for more “sacred” purposes such as five daily prayers and the direction of *qibla* to more “profane” objectives like the computation of “auspicious moments” and “horoscopes” for the desired locations. One obvious difference between the *muwaqqit* and *munajjim* might be that the expertise of a *muwaqqit* in calculating time for the five daily prayers would not require a careful observation and computation of the movement of all seven planets and calculations on the basis of the Sun and Moon would be sufficient. In the case of the *munajjims*, however, a full comprehension of the movements of the planets and knowledge of the fixed stars was required. Yet as manifest in the Süleymaniye waqfiyya as to the desired features of an erudite *muwaqqit*, most of the experts had mastery over the knowledge of all seven planets and other celestial phenomena.

In addition to the anecdotal evidence purported by Sonja Brentjes, surviving Ottoman materials once again provide the hard evidencet to illuminatre the astrological preoccupations of several *muwaqqits*. As is clear thanks to some of the surviving Ottoman *taqwīms* in the sixteenth

\textsuperscript{78} King, “On the role of the muezzin and the *muwaqqit* in Medieval Islamic Society.” See also his “The Astronomy of the Mamluks,” *Isis* 74 (1983), 531-555.

century, *muwaqqits* often engaged in the production of annual almanac-prognostications. A certain Necmeddîn b. Seyyid Muḥammed from Bursa (d. later than 1553), who from at least 1526 to 1529 held the office of the timekeeper in the Old Mosque in Edirne, kept compiling *taqwîms* with detailed astrological predictions, two of which have survived into our own time.\(^8\)

The other extant *taqwîms* of Necmeddîn enable us to follow his career. From 1535 up until 1553, he worked as the *muwaqqit* of the Fatih Mosque Complex in Istanbul.\(^9\) Unfortunately we are bereft of any evidence that explains the exact occasions of his appointment from one position to another. Curiously, during roughly his earlier tenure as the *muwaqqit* of the Old Mosque in Edirne, Necmeddîn was also listed among the monthly-salaried court *munajjims*.\(^10\)

It is quite interesting to see Necmeddîn listed as a court *munajjim* in the relevant registers from the late 1520s and early 1530s. Did he hold dual offices at the time, or did the court temporarily appoint him in between his two tenures as the *muwaqqit* of imperial mosque complexes? Drawing solely upon his autographs in surviving almanac-prognostications and scattered archival information, it is difficult to reach a definitive conclusion as to the exact trajectory of Necmeddîn’s career. Yet it is certain through his extant almanac-prognostications that, *contra* David King’s arguments in the Mamluk context, Ottoman *muwaqqits* were documentedly involved in astrological practice. In addition to the case of Necmeddîn b. Seyyid Muḥammed, another example of the astrological engagement of *muwaqqits* is Yūsuf b. ‘Ōmer el-Saʿāṭî, who composed his oldest surviving almanac-prognostication in 1511 while he was the

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\(^{8}\) Arkeoloji Müzesi, 19b: “*istikhrâjahu wa ḥarrarahu al-faqīreddîn b. Seyyid Muḥammed al-muwaqqit fi jâmiʿ al-ʿatîa bi-maḥrûse-i Edirne.*”

\(^{9}\) BnF Turc 183, 14b: “*istikhrâjahu al-ʿabd al-faqīr Necmeddîn b. Seyyid Muḥammed al-muwaqqit bi-jâmiʿ Sultan Muḥammed.*”

\(^{10}\) KK 1764, 26 (dated March 1527): “*ʿâdât-i Necmeddîn munajjim ki dar rûz-i navrûz takvîm âvord, 1000 [aççe].*”
muwaqqit of the Fatih mosque complex.83 Within the next three years, Yusuf munajjim was promoted to the office of the court munajjims, as we see him autographing his almanac prognostications from 1514 onwards with the signature “al-munajjim fi bāb al-sulṭān.”

Given these two documented cases of muwaqqits providing astrological advice, and the stipulations of Fatih and Süleymaniye waqfiyyas where an individual conversant in the broader category of the “science of the stars” is expected to work as a muwaqqit, we have enough reason to assume that the post of muwaqqit in major imperial complexes also helped practicing astral experts to secure stable financial means. These posts often offered commensurate, and sometimes even better, remuneration compared to those provided by the office of court munajjims. For example, according to the detailed account book of the Ayasofya complex from the late 1480s, a muwaqqit was qualified to earn thirteen akçes a day, an amount slightly more than the salary of the only munajjim listed in the sole surviving payment register from the time of Mehmed II’s reign, who was receiving ten akçes per diem in 1478.84 In the late 1540s when the number of court munajjims gradually dropped from four to two—hinting at the overall decline in the extent of the courtly patronage of celestial expertise in the course of the sixteenth century—the amount received by one of those two munajjims was only six silver akçes, much less than a muwaqqit of the Süleymaniye complex at the time would make.85

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85 MAD 7118. According to this register covering the years 1548 and 1549, Yūsuf b. ʿÖmer was receiving twelve akçes, whereas ‘Alī, who is known as Riyāżī, was making only six akçes a day.
Such circumstantial and thin evidence on the status of *muwaqqits* and instruction of rational sciences in the *madrasa* and/or mosque environment is not a proof to the formal teaching of strict astrological knowledge in these institutional settings. In fact, had manuals and textbooks on astrological principles been instructed in the *madrasa* setting, one would have expected to find many more surviving copies of these texts. Notwithstanding the fact that there was no formal instruction of strictly astrological texts in the *madrasa* setting, astrological practice itself—as well as the sister category of divinatory sciences—was an integral part of the daily lives of at least some of those *mudarris*es, who might have approached these sciences either as a legitimate field of knowledge and/or as a tool for entertainment and leisure-time activity to appeal from time to time to cope with the perennial question of predicting the unforeseeable future. The interest of at least some *mudarris*es in these practices can easily be corroborated by an array of surviving evidence gleaned from paratextual notes in manuscripts, inventories of private book collections, and contemporary biographical and autobiographical accounts.

The circulation of astrologically informed texts among *mudarris*es in the course of the late fifteenth and the first half of the sixteenth century is documented by ownership notices in manuscripts or inventories of private book collections. For example, the almanac-prognostication (*taqwīm*) produced for Meḥmed II for the year 872/1468 seems to have possessed by a certain Caʿfer b. ʿĪvaẓ, who was the *mudarris* of the Torumtay *madrasa* in Amasya around the mid-sixteenth century. It is not clear how this presentation copy produced for the sultan passed later into the hands of a petty ʿālim from Anatolia but Caʿfer not only recorded his own name on the frontispiece as the owner of the copy but also made intriguing calculations as to the exact a fact that seems to have irritated him. More details on Riyāżī’s life and resentment could be found in Chapter 3 and 5.
number of years remained until the end of the world. According to the contents of these notes he apparently put them in 959/1551-2, about 87 lunar years after the original composition of the taqwīm. In the chronology section of the taqwīm is written that 4,570 years have elapsed since Noah’s flood. Ca'fer mudarris here adds 87 years (28 years till the turn of 900, and additional 59 years up until his own day) and finds a total of 4,656 years that have fully passed. He then writes that there is a 1,200-year difference between [the birth of] Adam (i.e., the Creation) and the flood of Noah. He adds it to the previous 4,656 and reaches 5,856. According to the belief of the world’s having a 7,000-year lifespan, which Ca'fer mudarris seems to have embraced, there were then 1,144 years left till the end of the world.86 This mid-sixteenth-century scholar from Amasya presents us a unique case of a mudarris engaging an astrological text with contemporary debates on the age of the world and the timing of the apocalypse.87

86 Bodleian Arch. Sel. 31, 1a: “müddet-i dünyā yedi biñ yil imiş, bu takdīrce bākī 1,144 yil daği vardır ki yedi biñ yil tamam ola vallāhu 'ālem.” The sources of the belief establishing the age of the world as 7000 years seem to be related to the hadith literature, some of which were even collected by prolific jurists and theologians as al-Suyūṭī (d. 1505). In the astral lore, however, the world year concept and the chronological calculations from the Flood onwards are not explainable by any single derivation. On the complexity of the issue and available sources, see Edward Kennedy, “The World-Year Concept in Islamic Astrology,” in Studies in the Islamic Exact Sciences, ed. David King and Mary Helen Kennedy (Beirut: American University in Beirut, 1983), 351-371.

The life span of the world
87 Although debates and expectations about the imminency of the apocalypse was a theme frequently visited in the fifteenth and sixteenth century Ottoman realm by contemporary literati and individuals with overt Sufi leanings, astrological texts from the period, with the possible exception of popular malḥama literature, are surprisingly little informed by the apocalyptic discourse. For examples of the penetration of apocalyptic discourse into the textual outputs from the period, see Cornell H. Fleischer, “The Lawgiver as Messiah: The Making of the Imperial Image in the Reign of Suleyman,” in Soliman le magnifique et son temps, ed. Gilles Veinstein (Paris: La Documentation Française, 1992), 159-177; idem., “Mahdi and Millennium: Messianic Dimensions in the Development of Ottoman Imperial Ideology,” in The Great Ottoman-Turkish Civilization. Vol. 3, Philosophy, Science and Institutions, ed. by Kemal Çiçek, 42-54; Barbara Flemming, “Sāḥīb-ḵīrān und Mahdī: Türkische Endzeiterwartungen im ersten Jahrzehnt der
There were several other madrasa-affiliated individuals, who were actively interested in the composition of astrological texts, particularly of annual almanac-prognostications (taqwīm). Mīrīm Çelebi, for example, about whom more details will be presented in the next chapter, used to write almanac prognostications while he was a mudarris in the teaching institutions of Bursa and Edirne. In a similar vein, Qāḍī-i Baghdad (d. later than 1512), who escaped first to Mardin, then to the Ottoman lands in western Anatolia after Shah Ismā‘il’s progress towards ‘Irāq-i ʿĀjam and his concomitant persecution of Sunni scholars, produced in the year 913/1508 a decorated almanac-prognostication while he was the mudarris of the Sultaniyye madrasa in Bursa.  

The production of almanac-prognostications by mudarrises remained a standard phenomenon well into later centuries. Apparently, a seventeenth-century taqwīm in Arabic from around the year 1628 with surprisingly candid astrological predictions about sultan Murād IV (r. 1623-1640) was written by the mudarris of the madrasa of Sarqhatmish in Cairo. 

The period also witnessed the penetration of astrologically valid books into the private collections of scholars as well as madrasa libraries. Through a few curious archival registers that list the titles of surviving items in the private collections of the ʿulamāʾ or the madrasa libraries is possible to more accurately evaluate which astrologically valid books were favored by contemporary scholars.

The most important of these records is the detailed inventory of books prepared a few

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88 Qāḍī-i Baghdād, Taqvīm, British Library Or. 6432/2. Qāḍī-i Baghdād’s name is recorded on the contemporary register of gifts and payments as the recipient on April 25, 1508 of 1,500 silver akçes for his debut presenting the sultan with his taqvīm (ibtidāʿ-i ʿādet-i Mevlānā Sinān Qāḍī-i Baghṭād ... ki taqvīm ävord) Atatürk Kitaplığı Muallim Cevdet O. 71, 263.
89 The University of Michigan Library Islamic Manuscripts Ms. 794: “ḥadhā taqvīm Mawlānā al-sayyid al-majīd ṣāhib al-faḍl al-zāʾir mudarris al-Sarkhatmishīyya.”
years after the death of Mü‘eyyedzade ‘Abd al-Rahmān that enumerates all the titles retrieved from his massive 7,000-volume collection.\textsuperscript{90} As already discussed in greater detail in the first chapter, Mü‘eyyedzade’s significance rests upon his long teaching and administrative service at the highest ranks of the ‘ilmiyya hierarchy that enabled him to, teach new generations of scholars and administer appointments in the scholarly bureaucracy. Given his vast impact on the formation of the next generation of Ottoman ‘ālims, it may be quite telling to reconstruct the intellectual predilections of Mü‘eyyedzade. In addition to his own but limited writings, one of which was already introduced in the first chapter, the inventory of books that lists the titles of surviving items from his bibliotheca gives us a special opportunity to delve into the intellectual world of an influential early sixteenth-century Ottoman scholar.

As a student primarily of Jalāl al-Dīn Dawānī (d. 1502), who showed a marked interest in mathematical-philosophical quests in addition to his intensive study of traditional Islamic sciences, it is unsurprising to see Mü‘eyyedzade paying special attention to books on different branches and genres of celestial knowledge, ranging from hay’a and aḥkām to celestial magic and other occult practices.\textsuperscript{91} According to the ijāza given to him on 11 Jumādā I 888/17 June 1483, Dawānī licensed him to transmit books in the fields of both transmitted (naqlī) and rational (‘aqlī) sciences. The ijāza identifies four texts that Mü‘eyyedzade studied with Dawānī and two of these texts are specifically on theoretical astronomy and geometry. The first one is Qāḏīzāda al-Rūmī’s commentary on Chaghmīnī’s al-Mulakhkhas fī’l-hay’a that Mü‘eyyedzade read “from

\textsuperscript{90} TSMA D. 9291/1-2.

its beginning to its end.” The other one is Ṭūsī’s Ṭahrīr ʿIṣlīdīs, an expositional work on Euclidian geometry.\footnote{Judith Pfeiffer, “Teaching the Learned: Jalāl al-Dīn al-Dawānī’s Ḳīāza to Muʿayyadzāda ʿAbd al-Raḥmān Efendi and the Circulation of Knowledge between Fārs and the Ottoman Empire at the Turn of the Sixteenth Century,” in The Heritage of Arabo-Islamic Learning. Studies Presented to Wadad Kadi, ed. Maurice A. Pomerantz and Aram A. Shahin (Leiden: Brill, 2016), 284-332.}

The inventory of surviving books from Mü‘eyyedzāde’s massive library is quite representative of almost all the canonical works of Islamic corpus astronomicum and corpus astrologicum that contemporary munajjims in the Ottoman realm also preferred. As an avid collector and reader of zijes, Mü‘eyyedzāde seems to have collected in his library more than fifteen volumes of zij, which include at least two copies of the Ulugh Beg tables, two copies of the Ilkhanid tables, two copies of unspecified commentaries on the Ilkhanid tables, two copies of Wābkanawī’s tables, one of which he purchased in the town of Ladik in late 1477,\footnote{Now available at SK Ayasofya Ms. 2694.} one copy of Jamshīd al-Kāshī’s Zīj-i Khāqānī, one copy of an unspecified commentary on the Ulugh Beg tables, one copy of al-Zīj al-Shāmil, and one copy of the zij of Mevlānā Küçek Yezdānbaḥṣ, which was composed and presented in Amasya to Bāyezīd II in the year 1477. Based upon his personal notes on the single surviving manuscript copy of this last zij, Mü‘eyyedzāde seems to have possessed it soon after it was composed. He apparently made several astrological calculations in light of the tables offered by Mevlānā Küçek. Apart from the zij tradition of the Islamic East, Mü‘eyyedzāde was also interested in astronomical tables prepared in the western end of the Mediterranean. Although it is not specified in the inventory, around the year 1502 the Jewish émigré-scholar Moses Galeano prepared the Arabic translation of Abraham Zacuto’s (d.
In addition to the zij corpus, Mü‘eyyedzade was almost equally interested in other branches and genres of celestial knowledge. In terms of more theoretical astronomical works (i.e., ‘ilm al-hay’a), his library housed copies of the Islamic corpus of the Almagest commentaries (e.g., Ţūsî’s Tahrîr al-Majîstî, Qâdîzâda’s Hâshiyâ li-Majîstî, or other unspecified copies like Kitâb-i Majîstî), and theoretical astronomical works produced especially in the post-thirteenth century Persianate East, including Chaghmînî’s al-Mulakhkhas fî’l-hay’a al-basîta, Ţūsî’s Tadhkira fî al-hay’a, Quṭb al-Dîn Shirâzî’s Tuḥfâ al-shâhiyya, and Qâdîzâda’s commentary on Chaghmînî’s work. With respect to treatises on instruments used for celestial observation and calculation, the inventory contains several copies of astrolabe treatises, including Ţūsî’s Risâla-i Bîst Bāb fî dar ma‘rifat-i uṣṭurlâb and another book on observational methods (Kitâb a‘mâl-i raṣadiyya).

Regarding strictly astrological textbooks, one can find almost all the canonical works in Mü‘eyyedzade’s voluminous library including (Pseudo-) Ptolemy’s Thamara, Ţūsî’s Sî faṣl, Kûshyâr’s Mujmal, Bîrûnî’s Tâfshîm, Shâhmardân-i Râzî’s Rawdat al-munajjîmîn, ‘Alî-Shâh’s

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94 María José Parra Pérez, “Estudio y edición de las traducciones el árabe del Almanach perpetuum de Abraham Zacuto” (Ph.D. Dissertation, Universitat de Barcelona, 2013). I would like to thank Julio Samsó for bringing this study to my attention.

Aşmār va ashjār, and unspecified works of Abū Ma’shar. Last but not least, Mü‘eyyedzāde’s collection also contains works on celestial magic and other divinatory practices including the *Shams al-ma‘ārif* of al-Būnī, *al-Sīr al-maktūm* of Fakhr al-Dīn Rāzī, *Ghayat al-Ḥakīm* attributed to al-Qurṭubī (d. 964), and generic titles on talismans (*Risāla fī ʿilm al-ṭilsim*), on eiromancy, and lettrism (*ʿilm al-jifr*).

There is definitely a need for further research to explore the curricular and extra-curricular activities of Mü‘eyyedzāde’s students as well as many other Ottoman ʿālims from the sixteenth century in order to better evaluate the extent of the interest of traditional madrasa-educated scholars in celestial matters. The case of Mü‘eyyedzāde may seem rather exceptional, especially given his close proximity to Bāyezīd II whose immense astral interests will be discussed in further detail in the next chapter. Nevertheless, we still have evidence, albeit sporadic, that among the mudarrises of the first half of the sixteenth century were there certain individuals seeming curious about, if not deeply learned, in related fields of knowledge.

The two detailed inventories of the library of the *Ṣaḥn madrasas*, one produced in the late fifteenth century containing 1241 volumes, the other compiled on 21 Rebi‘ul-Āḥir 968/9 January 1561 enumerating 1770 volumes (with additional donated items), demonstrate that besides numerous works on sciences that were traditionally taught in madrasas, there were also several books important for astrological practice present at the time in the madrasa library. The book holdings at the library of the *Ṣaḥn madrasas* include volumes donated in the course of the late fifteenth and first half of the sixteenth century by different contributors including several

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95 The first of these catalogues is available at BOA. D. HMH. SFTH. 21941-B, and the other at TSMA D. 9559. Both of these catalogues have been introduced and partially discussed by İsmail Erünsal in his “Fatih Camii Kütüphanesine Ait En Eski Müstakil Katalog,” *Erdem* v. 9, n. 26 (1996), 659-665.
prominent scholars of the time and Meḥmed II himself. The introductory remarks of the first defter, which was written during the time of Bāyezīd II, makes it explicit that the register was prepared, first, to physically inspect the items in the library that had been donated by Meḥmed II, and second, to add to the already available inventory those books recently donated by various scholars.\textsuperscript{96} The second defter, which was compiled in the year 1561 by one of the Saḥn mudarrisēs at the time, Mevlânā Ḥācı Ḥasanzāde Efendi, was written with a similar aim of inspecting the items in the library and registering recent donations in the inventory.\textsuperscript{97}

Each inventory is divided into separate sections based upon the donations of individual benefactors. In each section, titles are classified according to disciplines, and the information on each item includes brief notes on the contents and material features of the volume (i.e., the number of folios, type of paper and script, etc.). The first category is taṣīr (Quranic exegesis) and it is followed in order by hadīth, uṣūl [al-fiqh] (Principles of Islamic Jurisprudence or Legal Theory), furūʿ [al-fiqh] (Branches of Islamic Jurisprudence or Substantive Law], kalām (Islamic Scholastic Theology), Arabic language, and logic. The last category is often assigned to the miscellaneous works (taṣīl al-kutub al-mutafarrīga), which may list, depending on the intellectual proclivities of the donator, books on Sufism, history, medicine, mathematics, ʿilm al-hayʿa and ʿilm al-nujūm.

Although in any private collection of a scholar the number of items that could be associated with astrologically valid knowledge is unsurprisingly limited in contrast to the books

\textsuperscript{96} BOA. D. HMH. SFTH. 21941-B, 2a: “Mecmūʿ-ı kütüb-i sultāniyye yedi yüz toksan altı ve sābıkan mütevelli olan Mevlânâ Yegânoğlu virdiği bedeller kırk bir ʿaded ve sāʿir mevâli-i kirām vakf itdikleri kitāb cümle üç yüz seksen toksz ve defter-i ʿatıkde bulunmayub kitâbhânedede mevcūd olan kitâblar on beş ʿaded, cemʾen: 1241.”

\textsuperscript{97} TSMA D. 9559, 1a: “Şemâniye müderrislerinden Mevlânâ Ḥācı Ḥasanzâde Efendi yoklayub yazdığu kitâblar defteridür...”
on traditional sciences, the inventories are still important for proving the presence of such works among the holdings of the mudarrisers. For example among the forty-one items granted to the madrasa by Mevlânâ Ahmed Celebi b. Yegân (d. first half of the sixteenth century), the greater majority of items are related to ʿuşul al-fiqh and furūʿ al-fiqh but he seems to have possessed a copy of Ṭūsī’s Sī faṣl. Mevlânâ Muhyîddin from Alanya (d. first half of the sixteenth century) also seems to have had a copy of Ṭūsī’s Sī faṣl, as this was one of his sixty-five donations to the madrasa. The most comprehensive set of books donated by a scholar descends from Ḥalebîzade (d. later than 1540), who gave 333 volumes to the Saḥn library. Among these items the ones that deserve particular mention are as follows:

i) A majmūʿa containing various works on judicial and horoscopic astrology as well as sections from Râzî’s book on celestial magic, al-Sîr al-Makṭūm, and the sayings of the ninth-century Jewish astrologer Mâshâʾillâh.

ii) Another majmūʿa consisting of textbooks on the use of astronomical instruments and application of astrological principles as well as geometry and ʿilm al-hayʿa.

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98 BOA. D. HMH. SFTH. 21941-B, 35b: “Kitâb Sharḥ Sī faṣl li-Mawlânâ Wâjid, Dimašqî nişfîndan kırılmış, kırmızı cildli, yüz țokuz varak”
99 Ibid., 49a: “Kitâb risâle-i Sī faṣl min ʿilm al-nûjûm, Dimašqî nişfîna saru kâğid, mukava cildî, yigirmi dört varak”
100 TSMÂ D. 9559, 75a: “Kitâb majmûʿ fihi...faṣl fî maʿrifat masîr al-Shams wa l-Qamar wa l-kawâkib wa akhâmihâ wa faṣl fî maʿrifat sinânî al-ʿâlam bi-ḥash ẓawâliʾiḥâ min al-burûj ... wa baʿţ fawâʾid min al-sîr al-makṭūm li l-imâm Rāzî ... wa faṣl min kalâm Mâshâʾillâh yata alliq bi n-nûjûm wa kitâb dalâʾ il al-shuhûr al-Rûmiyya wa l-ʿArâbiyya wa kitâb yata alliq bi n-nûjûm ... wa fawâʾid mîhâ alliq bi n-nûjûm.
iii) Nīẓām al-Dīn al-Nīsābūrī’s commentary on Ṭūsī’s Ṣī ṣaṣl.102

Such examples as to the literacy of some of the sixteenth-century mudarrisēs in the field of astrological knowledge could easily be extended with further archival, manuscript, and literary evidence. According to the waqfiyya of the books donated by a certain Mawlānā Shaykh Ishāq b. ‘Abd al-Razzāq, a mid-sixteenth-century scholar in Istanbul, one copy of Kitāb al-Thamara, one copy of an unspecified commentary on Ṭūsī’s Ṣī ṣaṣl, and two copies of a treatise on the astrolabe were possessed by him along with many other works on philosophy, medicine, and ‘ilm al-hay’a.103 Another lesser-known mid-sixteenth-century mudarris that showed a marked interest in the relevant lore was Ža’īfī (d. later than 1557), who, around the late 1540s, personally copied, either for his own personal interest or for the use of broader readership—texts on astronomical instruments, astrological principles, and divinatory practices. Quite intriguingly, on one of the folios of this mecṃū’a, Ža’īfī recorded a short note on the application of a simple prognostication technique to calculate whether an individual who asks for the benevolence of an influential person would attain his desire or not. According to his prognostication, the matter he has requested from Rüstem Paṣa, the grand vizier of the time, would eventually turn out well after a certain level of suffering and uncertainty.104 Apart from archival and manuscript evidence,

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101 Ibid., 75b: “Kitāb majmū’ fīhi kitāb Iqādis wa kitāb ḥall shukūk Iqādis wa risāla fī ṣuwār al-kusūf li-ibn al-Haytham ... maqāla lahu fī samt al-qibla bi’l-ḥisāb ... wa risāla fī’l-ustūrlāb wa kitāb al-mudkhal fī ‘ilm al-nujūm wa risāla fī aḥkām al-nujūm ... wa risāla fī’l-ustūrlāb.”

102 Ibid., 77a: “Kitāb sharḥ Ṣī ṣaṣl fī ‘ilm al-nujūm li-Nīẓām al-Dīn al-A’rāj, tamam-i Dmaṣḵī tamamından kırılmış ... muqavva cildlū ... ta’lik ḫattā yazılmış, otuz varak”


104 See Kandilli Rasathanesi Library Ms. 123, 3a: “Benüm hācetūm fulan kāntna hāṣal olur mi olmaz mı? Kendi ismiñ hisāb eyle ve ol hācet ṭaḥel itdāgün ismin hisāb eyle. Daḥi cümle eyle, üç
contemporary literary sources also document the preoccupation of some mudarris ines with astrological and other divinatory curiosities. In the Leṭāʾif compilation of Zātī (d. 1546), one of the most prominent poets of the sixteenth century, there are anecdotes about Sahn mudarris ines, who frequented Zātī’s geomancy shop located in the Beyazıt neighborhood of Istanbul to have Zātī cast their lots and read their fortunes.105

Despite all the evidence on the appeal of mudarris ines to astrological and other divinatory practices, the sporadic appearance of the phenomenon does not necessarily help us decisively argue that astrologically valid knowledge and divinatory sciences were formally instructed in the madrasas and/or the mosque complex.106 It is thus safe to conclude here that although

105 One particular story is related about Muḥammed Shāh Çelebi (d. 1532-3), one of the mudarris ines of the Sahn at the time who apparently asked Zātī to prepare and interpret for him a wafq (magic square) table. See Mehmed Çavuşoğlu, “Zati’nin Letayifi I,” İÜEF Türk Dili ve Edebiyatı Dergisi 18 (1970), 1-51.

106 The details provided by the Kevâkib-i Seba’a, the most comprehensive study of the teaching curriculum in the Ottoman madrasas written in the first half of the eighteenth century at the request of the French ambassador in Istanbul, also establish that no formal class was taught in the madrasas on astronomical instruments or astrological techniques. The text, however, intriguingly mentions that madrasa students would like to take the weekly vacation days (Tuesday and Friday) as an opportunity to study treatises on astrolabes and divinatory practices. It is interesting to note here that the hands-on study of the science of the astrolabes and quadrants was required to be performed in the open air; thus students preferred working on these subjects during the summer. The passage also demonstrates the desire of students to deal with occult practices but their instructors would not allow them. See Nasuhi Ünal Karaarslan (ed.), 18. Asrın Ortalarına Kadar Türkiye’de İlim ve İlimyeye Dair bir Eser: Kevâkib-i Seb’a Risalesi (Ankara: TTK, 2015), 77-78: “Ve ma’lüm ola ki ‘ulemā ʿullabni ʿabāyi ine melâl gelmeyüb dâʾ imā ‘ilmе müteşevvık olmak içün yevm-i şilesa ve yevm-i cum’ aıyı hâsilı haftada iki günü taʾīl i ʿibār itmişlerdir. Bu
astrological and cognate divinatory practices might have been a regular component of urban social life around the madrasa and the mosque, one cannot speak of formal instruction of these sciences at the educational institutions of the time. Unlike some contemporary European universities where there were chairs for astrological instruction, the astrological practice in the Ottoman (and Islamic) dominion seems to have lacked such an important component.

Where could, then, would-be munajjims and aspirants of astrological practice obtain their knowledge? As George Saliba outlines in his influential article on the role of munajjims in the medieval Islamic world, private tutoring was the most common method in the early-modern Ottoman context for the training in and transmission of astrologically valid knowledge. One-on-one teaching, however, does not necessarily contradict the institutional character of education. Instead, private tutoring often took place within the semi-institutional framework of the court. In the next chapter I will discuss in detail fashion the gradual formation of the office of court munajjims in the Ottoman palace by the reign of Bâyezîd II and its impact upon the vocational training and later professional careers of practicing munajjims.

iki günde ṭullâb baʾz-ı levâz mâtümî ruʾyet ider ve yaz günü ise baʾz-ı mesâre maḥalllere seyre giderler ve anda daḥî yine pek boş durmayûb ḥisâb ve ʾîlm-ı hendese ve ʿusturlâb ve rubʾ ve mesâhâ ve ʾîlm-ı ḥisâb-ı hindî ve kâfî ve zencî ... ve baʾz-ı bu müğîlâ müsâlîn derse muḥtâc olmayan ʾîlmi müzâkere iderler. Ve kıṣ günü ise giclelede ʿohbet idûb baʾz-ı muʾammâ ve elgâz ve muḥâzârât ve târîh ve edebiyât ve ʾarûz ve devâvîn müzâkere iderler baʾzîsi ʿulûm-ı garîbeye daḥî mürâcaʿat isteer amma müşkil olmâğa ḥâceler ʿizîn virmezler.”
Chapter Three—Royal Patronage of Astrology, the Office of the Court Munajjims, and the Special Case of the Reign of Bāyezīd II (r. 1481-1512)

III. 1. Introduction

Having overviewed the sources munajjims needed for their training, and the limited role of the madrasa as well as the muwaggitkhāna in the production and circulation of astrologically valid knowledge, it is in order now to focus upon the royal court, which was the single most important institutional form for the patronage of munajjims and transmission of relevant knowledge in the early modern Ottoman world. We should, however, keep always in mind the multifarious nature of the court in the medieval and early modern era. The “court” in the medieval context generally refers to the extended household of a ruler, accompanied by his family members, entourage, and servants in various capacities; whereas the early modern court has often been considered more than a household. It was indeed “an abstract totality”, composed of individuals “in service to, but not necessarily in immediate attendance upon, a sovereign.”¹ Nevertheless, despite the gradual development of the early modern court out of the medieval royal household, the personal interests and cultural affinities of the ruler often shaped, in both cases, the contours of the court life. Hence, one should be careful to differentiate between the court cultures of different rulers even under the single dynasty.

Moreover, in the context of the patronage of arts and sciences in any court culture, one

should also distinguish between the courtly patronage of individual experts in a particular craft and the systematic institutional support for their expertise. As Sonja Brentjes aptly remarks in her examination of the courtly patronage of mathematical sciences in the medieval and early-modern Islamicate world, one of the key aspects of the patronage culture was that “[r]uler supported scholars, not disciplines.”

The royal support for individual experts consequently fostered the cultivation of that particular expertise but Brentjes’s remarks are important for drawing attention to the impermanent nature of scientific patronage that was shaped largely by the intellectual proclivities of individual patron rulers. We should thus keep it in mind that in the pre-nineteenth century Ottoman context where it is difficult to speak of a deliberate state policy or a powerful artisanal/entrepreneurial medium for the support of scientific and technological advancement, individual patronage of rulers was the key mechanism for the astral experts to pursue their aspirations. Yet patronage itself was by nature shaped by the immediate needs and inclinations of the sovereigns. The preferences of patron rulers, or princes, were subject to change as their tastes and immediate concerns mutated. Therefore, munajjims, like many other artists and individuals from diverse fields of expertise, were vulnerable to these fluctuating dynamics of the complex patronage culture.

The appeal to the expertise of munajjims is indeed one the salient themes of court life

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3 The influence of wealthy urbanites and learned individuals in the production of scientific knowledge and material technology still waits to be thoroughly studied in the early modern Ottoman context. For some initial remarks on the question, see Miri Shefer-Mossensohn, Science among the Ottomans. The Cultural Creation and Exchange of Knowledge (Austin, TX: University of Texas Press, 2015), esp. 121-141. See also: Bekir Harun Küçük, “Early Enlightenment in Istanbul.” (Ph.D. Dissertation, University of California, San Diego, 2012), esp. 104-126.
throughout the medieval and early-modern era in the entire Eurasian landmass, and the Muslim dynasties were also not exempt from this trend notwithstanding the constant objections raised from different social circles against the practice of astrology. As already mentioned in the previous chapter, the millennium-long history of the courtly interest in the service of munajjims, from the Abbasids to the Mughals, has been discussed usually in discreet episodes by having recourse to scattered anecdotal evidence in biographical dictionaries, ādāb works, chronicles and other historical accounts.

From the perspective of the patron rulers, employing an individual munajjim or a legion of them had several important facets. First of all, the expertise of munajjims that incorporated mathematical competence, calendrical knowledge, and astrological know-how with ancillary familiarity with topographical matters had numerous practical benefits in the making of necessary temporal and spatial calculations. Though more substantial evidence is required for laying out the exact scope of services they offered as individuals learned in the broader discipline of mathematical sciences (al-ʿulūm al-riyāḍīyya), the wide-ranging expertise of munajjims must have been demanded in an array of fields such as calendar conversion and taxation, land survey and navigation, temporal assignments for undertaking imperial enterprises, and of course

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prognosticating the future course of actions. In especially regard to the system of time reckoning, the challenging task of intercalation and establishing harmony among different calendar systems was vital to regulate the social and economic life. For instance the discrepancy between solar and lunar calendars periodically invoked financial hardships due to the concomitant discordance between tax revenues and salary payments. While the former was collected according to the solar calendar, the latter was made based upon lunar months. This explains why from especially the late-sixteenth century on was there a visible concern in the financial branch of the Ottoman bureaucracy as to intercalating different calendars. In addition to the problems derived from the discrepancy between solar and lunar calendars, determining the first day of each month also often arose contradictions. In establishing the first day of any lunar month, and thus the beginning of Ramaḍān for instance, ehl-i şer preferred methods that solely depended upon observing the position of the moon with naked eyes; whereas ehl-i nüçüm had recourse to

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6 One contemporary evidence of this concern in the financial bureaucracy is a short treatise written in Sha’bān 989/December 1572 by a certain Seyfüllâh Çelebi defteri. As evident from his epithet, he was from the finance department of the bureaucracy. The text he wrote was aimed at intercalating solar and lunar calendars to reduce the financial problems. See SK Hacı Mahmud Efendi Ms. 6344, 85b-88b. For another textual example of intercalation composed in the early eighteenth century, see: Salim Aydüz, “İsmet Mehmed Efendi (ö. 1747) ve Tedahül-i Seneye Dair Risalesi,” *Kutadgubilig* 15-16 (2009), 223-264.

The indication of dates in zodiacal/astrological terms in some of the surviving bureaucratic documents hints that the scribal unit at the court was really utilizing the calendrical knowledge produced by the court munajjims. One entry from a *ruʿus* register recorded on 16 Dhū’l-hijja 953/February 7, 1547 specifies the date as the 28th degree of Aquarius. See Nejat Göyünç, “XVI. Yüzyılda Ruus ve Önemi,” *İÜEF Tarih Dergisi* XVII/22 (1967), 24: "yigirmi sekiz burc-ı delv, yedi Şubat,"
demanding astronomical and mathematical calculations. While this minor discrepancy did not have consequences as severe as those caused by the problem of harmonizing dates between different calendar systems, it still had an inevitable impact upon the accuracy (or lack there of) of the chronological information of events given in historical narratives and chronicles.

The practical benefits of employing *munajjims* by nature included their service of partaking in the interpretation of, and the advice on, the short and long-term political and military decisions through astrological reasoning. Besides the appeal to *munajjims*’ interpretations and predictions about the intended imperial actions, the royal patronage of *munajjims* also mattered as an important political instrument and even a powerful medium of

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7 There is a vast literature on the scientific calculations of the lunar crescent visibility in different contexts of the medieval Islamicate culture. For a useful summary of the discussion, see: David King, “Lunar Crescent Visibility Predictions in Medieval Islamic Ephemerides,” in *Quest for Understanding: Arabic and Islamic Studies in Memory of Malcolm H. Kerr*, ed. S.M. Seikaly, R. Baalbaki, and P. Dodd (Beirut: American University of Beirut, 1991), 233-251.

In the absence of *muwaqqiqs* and/or other astral experts in certain provincial areas, it was mainly the judges and their deputies who were responsible for establishing the first day of the month by observing and recording, in front of witnesses, the first visibility of the crescent. For a rich documentation of evidence culled from Ottoman local court records, see Rifat Özdemir, “Çeşitli Kültürlerde Zamanı Ölçme Faaliyetleri ve Bu Konuda Osmanlı Mahkemelerinin Uygulamaları II,” *Türk Dünyası Araştırmaları* 144 (2003), 559-590.

The implications of the temporal conflicts between the calculations of the *ehl-i şer* and *ehl-i nüccüm* need to be further investigated. The question is still valid in the Islamic World today, as at the beginning of Ramadan each year debates emerge about the beginning of the holy month and the ensuing festival. For an initial discussion on the scope and implications of such conflicts see King, “On the role of the muezzin and the *muwaqqit* in Medieval Islamic Society.”

This ideological aspect of the patronage of munajjims has, however, dual implications: on the one hand, munajjims’ interpretation of worldly events on astrological grounds and their sycophantic remarks for the reigning sovereign with full of heavenly metaphors, touting him as the supreme one among others certified by celestial portents, endowed the ruling party with irrefutable divine significance and recognition. On the other hand, the support given for a specific group of experts helped the sovereign easily disseminate his own image as a generous patron of knowledge. If the patron was also interested in the science itself, then it was even possible for him to reach his contemporaries as a learned ruler and even the idealized philosopher-king.

The reasons of the royal appeal to celestial expertise, particularly to astrology, are captured succinctly by Shukrullâh Shirvânî (d. later than 1504-5), who in September 1489 presented Bâyezid II a compendium of sciences entitled Riyâḍ al-qulûb, in which he discusses the true meaning and benefit of ‘ilm al-nujûm as follows:

“There is no discipline, save the religious sciences, nobler than ‘ilm al-nujûm … Rulers and sultans have need of it because incidents like earthquake, flood, war, famine, plague and others occur in the sublunary world due to the influence of the conjunctions, eclipses, and various planetary aspects. If one is knowledgeable in this science and closely tracks these celestial phenomena, one may hope to be secure from all harm.”

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9 See especially Darin Hayton’s book on the uses of astrology for the purposes of imperial propaganda during the reign of the Holy Roman emperor Maximilian I (r. 1493-1519).

10 For the role of patronizing sciences, particularly the science of the stars, in the image-making of sovereigns in the late medieval and early-modern context, see: Robert Westman, “The Astronomer’s Role in the Sixteenth Century: A Preliminary Study,” History of Science 8 (1980), 105-147, esp. 121-7; Mario Biagioli, Galileo, Courtier: The Practice of Science in the Culture of Absolutism (Chicago: The University of Chicago Press, 1993), esp. 1-11.

11 SK Ayasofya Ms. 4024, 62b. “ba’d az ‘ulûm-i dînî hîch ‘ilm a’lâ az ‘ilm-i nujûm nîst…va muhtâj ilayhi mulûk va salâtin ast chîn bi-vâsîta-i ta’îr-i qîrânât va kusûfat va sâîr hâlât-i kavâkîb dar ‘âlam-i kavvîij va fa’sâd vaqâyî ‘va zalâzîl va tûfânât wa muhârabât va qa’hî và vabâ va amnîl-iân váqi’ mî shavad. Agar kasî inn ‘ilm râ dânad va ân hâlât ra dar yâbad va rî ‘ayat namâyad umîd ki az âfît sâlim mânad.”
I will further substantiate below the practical benefits and symbolic meanings of the munajjims’ services for the dynastic court when I will introduce the specific case of the reign of Bāyezīd II and the personal stories of the experts active at the courts of Ottoman sultans. I should note here that as manifested in the above summary of the existing literature on the presence of munajjims in the medieval and early-modern court life, the Ottoman case was no exception. While it is possible to argue, on the basis of anecdotal and epistolographical evidence, that there were also court munajjims in the earlier and contemporary dynasties such as the Abbasids, Rum Saljuqs, Ilkhanids, or the Aqquyunlus, the Ottomans provide us a rare opportunity to document the continuous and regulated service of munajjims through a unique set of archival and manuscript materials. The gradual establishment of the office of court munajjims by the time of Bāyezīd II as an identifiable unit in the Ottoman bureaucratic structure was an important step in the institutionalization of the patronage of munajjims that significantly facilitated the vocational instruction of astrologically useful knowledge in the early-modern Ottoman realm.

It is the primary aim of this chapter to delineate the extent and ramifications of the unprecedented celestial interests at the court of Bāyezīd II that facilitated the influx of astral experts and expertise into the Ottoman capital from especially the Iranian world. While the efforts at his time were not always retained in the same extent by his successors, and the courtly

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12 Insha manuals produced in the Saljuq or Timurid times often include specific sections on how to properly address the munajjims, who are generally listed among other court personnel as physicians or scribes. See for instance Hasan b. ‘Abdi’l-Mu’min el-Khūyī’s Gunyatu’l-kātib wa munyatu’ṭ-ṭālib or Kāshīfī’s Makhzan al-inšā’. The former was published by Adnan Sadık Erzi: Selçukilere Devrine İnşa Eserleri. Gunyetu’l-kātib ve munyetu’ṭ-ṭālib. Rusūmu’r-resā’īl ve nucūmu’l-fażā’īl (Ankara: TTK, 1963). See also: Turan, Türkiye Selçukluları Hakkında Resmi Vesikalar: Metin, Tercüme ve Araştırmalar. The latter was located at BnF Ancient Fonds Persan Ms. 73. I would like to thank Colin Mitchell who has kindly let me know about the latter copy and its relevant contents.
enthusiasm for the expertise of munajjims seems to have gradually waned, if not entirely disappeared, by the second half of the reign of Süleymān—until it would be temporarily revived at the time of Murād III (r. 1574-1595)—Bāyezīd II’s input left a decisive imprint on the ways astrology was practiced in the Ottoman world in the following centuries. In parallel with these discussions, I will also insert the personal stories of a number of practitioners from the period in question to put more flesh on the bones of what has been described about the complex social history of the munajjims.

III. 2. The Royal Patronage of Munajjims at the Ottoman Courts and the Reign of Bāyezīd II (r. 1481-1512)

The earliest hard evidence of a munajjim at the service of an Ottoman ruler only dates to the first half of the fifteenth century, yet it does not strain credibility to assume that there were munajjims functioning ad hoc around the ruling party from its early days on. While there are taqwīms that came down to us from the time of Meḥmed I (r. 1410-1421), the earliest extant taqwīm featuring the autograph of a munajjim is from the reign of Murād II (r. 1421-1451). In the year 842/1439, a certain Ḫāmid b. shaykh al-munajjīmīn wa-r-rāmmāl, known also as Ibn al-Jamāl, presented the sultan with a taqwīm in Persian in which he conveys his astrological predictions as to the fortunes and mishaps of the upcoming year. The wording of his autograph

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13 According to Nihal Atsız’s study on the earliest Ottoman taqwīms, the 824/1421 taqwīm is housed as SK Muhtelit 1227. Unfortunately, there is no such collection today in the Süleymaniye Library and my research there did not yield any positive result to have access to this copy. Atsız published in his book the chronology section of the taqwīm without paying any attention to the astrological and calendric contents of it. See: Nihal Atsız, Osmanlı tarihine ait takvimler (İstanbul: Küçükaydın Matbaası, 1961), 3-57.

does not allow us to detect whether he was a designated court munajjim or a freelance expert presenting the sultan with his text, but the surviving manuscript definitely evinces the proximity of a certain astrologer-cum-geomancer to a reigning Ottoman ruler.

There are also few available taqwīms from the time of Meḥmed II, yet none of them bears an autograph that could enable us to identify a name of a munajjim at his court. Some of the contemporary and near-contemporary literary sources refer to a group of munajjims around Meḥmed II whom he would consult to designate the auspicious time for important military expeditions or construction of imperial buildings. One of these contemporary sources is Cardinal Isidore (d. 1463), the Greek metropolitan of Kiev who, as an eyewitness to the siege of Constantinople, says in one of his letters to Pope Nicholas V that Meḥmed asked his “Persian” munajjims (astrologi persiani) to designate the auspicious time for the siege.\textsuperscript{15} Somewhat similar stories may be found in the Ottoman sources. Ṭursun Bey (d. 1491?), for instance, briefly mentions that the munajjims calculated an auspicious moment for the construction of the fortress in the Bosphorus (i.e., Rumelihisarı) before the siege of Constantinople.\textsuperscript{16} In a similar vein, Tacizade Ca’fer Çelebi (d. 1515) relates that the munajjims calculated the favorable moment to begin the assault.\textsuperscript{17} Yet none of these Ottoman sources specifies the ethno-geographic affiliations

\textsuperscript{15} Quoted in Agostino Pertusi, \textit{La caduta di Costantinopoli}, vol. 1 (Rome, Fondazione Lorenzo Valla, 1976), 75: “Ha infatti a sua disposizione astrologi persiani molto scrupolosi, ed è appoggiandosi ai loro suggerimenti e alle loro decisioni che spera di riuscire ad ottenere il dominio supremo ed assoluto.”

\textsuperscript{16} Tursun Bey, \textit{Tarih-i Ebü’l-Feth}, ed. Mertol Tulum (İstanbul: İstanbul Fetih Cemiyeti, 1977), 44: “vakta ki ol mevzi’i matlubi ğiyam-i devlet ile muhâyem ve kudüm-i mubahîk ile mukerrrem kıldı, mehere-i mühendisîn ve kümmel-i müneccimîn müsâveresi ile mahall ü sâ’at ihtiyâr olunub kal’e bûnyâdîn urdular.”

\textsuperscript{17} Tacizade Cafer Çelebi, \textit{Mahruse-i Istanbul Fethnamesi} (İstanbul: Ahmed İhsan ve Şürekaşi Matbaacılık Osmanlı Şiirketi, 1331/1915-6), 10: “Her çend ecrâm-i ’ulvî ’âlem-i süfîle mü’essir-i ğaîkî alcuni idûği beyyindir fe-ammâ cûmle ’âlem ger bâlâ ve ger zîr çûn musâhîh-ı emr-i
of the munajjims.

Meḥmed II’s favorite son Cem Sultan (d. 1495) also appears to have developed an interest in the science of the stars in the course of his life. In an astrological work entitled Miftāḥ al-nujūm, which is composed in Turkish and presented in Bursa in Dhū‘l-qa‘da, 874/May 1470, the author Yaḥyā b. Ḥusayn Yaḥyā says that he used to deliver each year a taqwīm to the house of Cem Sultan, who eventually became interested in learning the intricacies of the science of the stars and requested a book simple enough to teach him the basics of it.18

As part of his broader imperial ambitions and cultural orientations toward utilizing the intellectual traditions greatly esteemed at his time, “regardless of the linguistic or religious context of their origin,” Meḥmed II was eager to patronize men of knowledge with varying expertise, including the masters of celestial knowledge, from different demographic quarters.19 His attempts to attract leading astral experts of his time from the Persianate East were commented upon by later historians including Idrīs Bīlīsī (d. 1520), who says in his Hasht Bihisht that the sultan invited ‘Alī Qūshjī and promised him to establish in Istanbul a scholarly

19 For that regard, Maria Mavroudi aptly says that the cultural orientations at the court of Meḥmed II were “neither East nor West, not simply because these labels did not exist in the same way they do now, but especially because he was only doing what princes before and after him often did.” See: Maria Mavroudi, “Translations from Greek into Arabic at the Court of Mehmed the Conqueror,” in The Byzantine Court: Source of Power and Culture, ed. Ayla Ödekan et al. (İstanbul: Koç University Press, 2013), 207.
environment where he could keep running his unfinished observation program.\textsuperscript{20} Meḥmed II’s genuine interest in recruiting ʿAlī Qūshjī seems to have related to the political prestige and instrumentality accorded to the courtly patronage of the science of the stars in the late-medieval and early-modern Turko-Persian cultural zone. Yet the urgent need of the sultan to welcome an astral expert of the caliber of ʿAlī Qūshjī and the wide authority warranted him to reorganize the entire Ottoman scholarly hierarchy (ʾilmīyya) are strong indications of the inadequacy of the systematized celestial pursuits in the Ottoman world in the last quarter of the fifteenth century.\textsuperscript{21}

At the time when ʿAlī Qūshjī and his entourage arrived in Istanbul, systematic scholarly activity on celestial knowledge was only premature in the Ottoman lands.\textsuperscript{22} Several treatises of Ṭūsī such as his introductory textbook on the astrological indications of planets, zodiac signs and planetary aspects (Ṣī faṣl), his Zīj-i İlkānī, or his memoir on astronomy (al-Tadhkira fi ʾilm al-hayʿa) were already in circulation in the lands of Rūm throughout the fourteenth and first half of the fifteenth century. The Fenārī circle in western Anatolia, including such members as the stellar scholar Mollā Fenārī (d. 1431) and ʿAbdulwājīd b. Muḥammad (d. 1435), was also well informed about the scientific output of the Maragha tradition.\textsuperscript{23} Yet anecdotal and archival


\textsuperscript{21} For an overview of ʿAlī Qūshjī’s move to the Ottoman capital and his short tenure there as well as his administrative service, see: Süheyl Ünver, Ali Kuşçi hayatı ve eserleri (İstanbul: Kenan Matbaası, 1948); Heiderzaideh, “Ali Kuşçu’nun Astronomi Eserleri,” especially 13-17.

\textsuperscript{22} For a general overview of the contours of scientific activities in the pre-sixteenth century Ottoman realm, see: İhsan Fazlıoğlu, “Osmanlılar (İlim ve Kültür, 1. Düşünce Hayatı ve Bilim. Kaynaklar),” TDV İÄ.

\textsuperscript{23} ʿAbdulwājīd b. Muḥammad was born in Khūrasan and came to the lands of Rūm in later fourteenth century. In addition to his treatise on the uses of astrolabe, he also penned a commentary on Ṭūsī’s Sī Faṣl. See: OALT, v. 1 (İstanbul: İslâm Tarih, Sanat ve Kültür Araştırma Merkezi, 1997), 22-24. See also: İhsan Fazlıoğlu, “İthaf’tan Enmûzec’e Fetih’ten önce
Evidence about scholars over the fifteenth century indicates that Ottoman territory was not the best place at the time for a would-be astral expert to excel in the science of the stars. For instance Qâḍîzâda-i Rûmî, one of the intellectual founders of the Samarqand observatory, grew up in Bursa and received his first education within the Fenârî circle, but his master Muḥammed Şâh Fenârî, the son of renowned Mollâ Fenârî, still felt compelled to suggest him to go to Iran and Central Asia to further his quests in astral lore. In a similar vein, a certain ʿAbd al-Raḥmân munajjim (d. later than 1510), about whom more details will be found below, was recommended around the 1480s by his primary patron Şehzâde Aḥmed to go to the Iranian lands (diyâr-i ʿAjam) to advance his knowledge in the discipline. Besides hinting at the embryonic level of systematic astral production in the Ottoman territories throughout the fifteenth century, these details also suggest that in the eyes of the fifteenth-century scholars born in the Ottoman lands, the Persianate east was the main point of reference and locus where one could gain a good command of the science of the stars.

Objections may be raised here with regards to ascribing astrological interests to Qâḍîzâda-i Rûmî or ʿAlî Qûshjî. Such a reservation is not altogether groundless, as the entire oeuvre of Qâḍîzâda-i Rûmî and ʿAlî Qûshjî does not include a single text that one could easily

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24 İhsan Fazlıoğlu, “Kadızade-i Rumi,” TDVİA.

25 ʿAbd al-Raḥmân Munajjim, Jawhar ḥifż al-siḥḥat fī al-ṭibb, SK Ayasofya Ms. 3635, 2b.
define as strictly an astrological work. Yet, as far as the present level of research on these two big names is concerned, their works did not entail a categorical rejection of astrological premises. Moreover, as already mentioned in the first chapter, the end product of the observations at the Samarqand observatory, the Ulugh Beg tables, which Qâdîzâda-i Rûmî and ʿAlî Qûshjî contributed significantly as the key collaborators in the observatory, is replete with information and data addressed to astrological purposes, especially for casting birth and yearly horoscopes. Also interesting is the fact that the activities at the Samarqand observatory were interpreted by some of his contemporaries, like Şâ’in al-Dîn Turka Iṣfâhânî (d. 1432), as being responsible for the “renaissance of “astrology.” Last but not least, the anecdotes narrated in some of the contemporary biographers about the use of divinatory practices in the presence of Ulugh Beg and ʿAlî Qûshjî, or Qûshjî’s curious attendance in the Otlukbeli campaign as one of the close courtiers of Meḥmed II hint at the commonality of such preoccupations among individuals that are strictly defined in modern historiography as enlightening scientists.


27 Especially the fourt chapter of the Zîj-i Ulugh Beg (“Maqâla-i chahârom dar bâqi a mâl-i nujûmi”) is reserved entirely for the techniques used in horoscopic astrology such as namûdârât, fîrdârât, or tasyûrât. In fact the tables given in the second (“Maqâla-i dovom dar maʿrifat-i avqât va ʿâliʿ-i har vaqt”) and the third (“Maqâla-i sâvom dar maʿrifat-i ravash-i sitârâgân va mavâzî-i ʿîshân dar tîl va ʿarz va tavâbiʿ-i ān”) chapters were also set out for astrological purposes. See Ulûg Beğ’in Astronomi Cetvelleri = Zîc-i Ulûg Bey, 2 volumes, ed. and tr. Mustafa Kaçar and Atilla Bir (Ankara: Kültür ve Turizm Bakanlığı, 2012).

28 Quoted in Fleischer, “Ancient Wisdom,” 231; Melvin-Koushki, “The Quest,” 64.

29 ʿAlî Qûshjî’s presence in the Otlukbeli campaign is documented by the colophon of the autograph copy of his al-Risâla alfathîyya that he finished and presented the day Meḥmed II defeated the Aqquyunlu Uzun Ḥasan at Otlukbeli. SK Ayasofya Ms. 2733 (quoted in Ünver, 30): “farîgha al-ʿabd al-mu allîf min tahribîhî fi awâsît rabîʿ al-awwal sana thamânâ wa sabʿîn wa thamânamiʿa (RA 878) kataba hadha l-asṭar al-mushawwasha al-faqîr al-ḥaqîr ʿAlî bin
Despite the allusions in contemporary and near-contemporary narrative sources to a number of (Persian) munajjims at the court of Meḥmed II and his genuine interest in the cultivation of the science, the archival records from the period rather tell a different story. There is in fact not much available in terms of archival documents from the time of Meḥmed II, though a relatively detailed payroll book from the year 883/1478 lists the names of palace personnel, including munajjims. Contrary to what is depicted by literary sources of the time, there was only one munajim, Mevlānā Küçek Yezdānbaḥş, who received ten akçe per diem, which was equal to the pay range of a messenger or a gatekeeper but significantly lower than that of a falconer or storyteller. Mevlānā Küçek is listed in the register under the loosely defined mutafarriqa corps, which also implies that there was not a special designated unit for the munajjims within the nascent bureaucracy of the time and that the lines between ad hoc function and formal office are still difficult to distinguish.

In his Asar-ı Bakiye, Salih Zeki (d. 1921), one of the most important mathematicians of the late Ottoman period and the first modern Turkish scholar showing interest in the history of science in the Ottoman past, also mentions Qūshjī’s engagement with astrological practice on the basis of a holograph copy of a mecmü‘a now located at SK Hamidiye Ms. 1446. See: Salih Zeki, Asar-ı Bakiye vol. 2 (İstanbul: Matbaa-ı Amire, 1329), 198.

One of the relevant anecdotes mentioned in the chronicle of Khāndamir (d. later than 1550) goes on to say that one day Ulugh Beg, while in the presence of his student ’Alī Qūshjī, asks a certain geomancer to foretell what is going to happen in his life. The geomancer was reluctant first to speak in front of ’Alī Qūshjī whom he barely knew, but after Ulugh Beg reassured him about Qūshjī’s trustworthiness, he went on to say that Ulugh Beg would kill one of his two wives and then divorce the second one.


For the mutafarriqa corps, see İsmail H. Uzuncaşlı, Osmanlı Devletinin Saray Teşkilâtı (Ankara: Atatürk Kültür, Dil ve Tarih Yükse Kurumu, 1984), 428-431; Tayyib Gökbilgin, “Müteferrika,” İA.
The real patron of celestial knowledge in the burgeoning Ottoman polity was Bâyezîd II. In fact the institutionalization of the patronage of munajjims in the growing bureaucratic structure of the Ottoman polity by the late fifteenth century was intimately related to the keen interest and personal investment of Bâyezîd II in the cultivation of celestial knowledge. While Meḥmed II’s learned character and curiosity towards philosophical and mathematical pursuits as well as the Greek/Byzantine heritage are relatively well-known phenomenon, the cultural and intellectual orientations of his son Bâyezîd II have largely been ignored in modern historiography. In fact, the long rule of Bâyezîd and his cultural policies have been systematically downplayed in the available literature in contrast to the “heroic” reigns of his father, and those of his immediate successors, his son Selîm I (r. 1512-1520) and grandson Süleymân (r. 1520-1566).

Bâyezîd’s so-called “pious” personality is often held responsible for isolating the Ottoman Empire from the cultural and intellectual achievements attained in contemporary Europe. He is usually contrasted to his father Meḥmed II and thus condemned for hampering the perpetuation of the cultural orientations and political ambitions prevalent at his time. As evidence for Bâyezîd’s culpability in the so-called intellectual and scientific setback at the turn of the sixteenth century, modern scholars often refer to the story of Leonardo da Vinci whose


33 For a review and critique of the studies that contrast the reign of Bâyezîd II to his father, see Cihan Yüksel Muslu, “Ottoman-Mamluk Relations and the Complex Image of Bâyezîd II,” in *Conquête ottoman de l’Égypte (1517): Arrière-plan, impact, échos*, ed. Benjamin Lellouch and Nicholar Michel (Leiden: Brill, 2013), 51-76.
plea to Bāyezīd to construct a bridge over the Golden Horn fell on deaf ears. Bāyezīd’s selling of the paintings and disposing of Christian relics kept by his father in the palace is yet another favorite story. He also allegedly turned down Christopher Columbus when the Genoese navigator approached him as a potential patron before embarking upon his costly expeditions, but it should be noted that the earliest available reference to such criticism directed against Bāyezīd for denying Columbus is only from the first half of the nineteenth century.

Bāyezīd II has also long been criticized for failing to take necessary measures against the emerging Safavid threat, with which his son Selīm was left to deal during both his governorship in Trabzon and his sultanate in Istanbul. One could note further reasons for the scholarly disdain for the reign of Bāyezīd II, including his inability to achieve a decisive victory against the Mamluks, and his elimination of Meḥmed II’s (and modern historiography’s as well) favorite son Cem Sultan (d. 1495) after a long struggle that soon gained an international character with the involvement of the Pope and several European powers. All these reasons have coalesced in contemporary scholarship with an image of Bāyezīd II as the weakest link in the so-called

34. The undated letter sent by Leonardo is now housed at the Archive of the Topkapı Palace Museum (TSMA E. 6184). According to the letter, Leonardo also proposed to devise for the sultan a number of other tools, such as a new kind of windmill and a sort of pump to empty out the water in the vessels. See also: Semavi Eyice, “II. Bāyezīd Devrinde Davet Edilen Batılılar,” Belgelerle Türk Tarihi Dergisi 19 (1969), 23-30.
36. Cevat İzgi, Osmanlı Medreselerinde İlim vol. 2 (İstanbul, İz Yayıncılık, 1997), 240.
37. The available scholarly conviction on Bāyezīd’s idleness vis-à-vis the emerging Safavid power is based primarily on the Selīmnāme literature, the earliest examples of which emerged as early as the later years of Selīm’s reign. The purpose of these works is to valorize Selīm and single him out as the only member of the Ottoman house that took serious the emerging Safavid problem. However, archival documents from the reign of Bāyezīd II clearly show that he was also closely following the Safavid problem and taking active measures, although he did not initiate an open battle. See for instance: Feridun Emecen and İlhan Şahin, II. Bāyezīd döneme ait 906/1501 tarihli ahkam defteri (İstanbul: Türk Dünyası Araştırmaları Vakfı, 1994).
Ottoman golden age from the mid-fifteenth to the mid-sixteenth century.

Despite the conventional representation of Bāyezīd II’s reign as a failure on a range of fronts, several cultural and literary historians were aware that he was an avid patron of the arts and belles-lettres.38 He is generally considered the founding patron of Ottoman dynastic history writing, having eagerly commissioned the first dynastic histories of the Ottoman rule.39 Modeled in the main on Timurid precedents, the voluminous histories of figures like Idrīs Bitlīsī, who wrote in Persian, and Ibn Kemāl (d. 940/1534), in embellished Turkish, helped not only carve a prominent place for the Ottoman house in the universal unfolding of events but also spotlight the rule and court of Bāyezīd II as supreme among all the previous and contemporary sovereigns.40 In addition to his active involvement as patron of the first dynastic histories of the Ottoman house, Bāyezīd II also lavishly supported a number of poets, calligraphers, and numerous artisans whom we can document thanks to the invaluable register of gifts and payments that

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record in great detail the names of all individuals receiving allowances from the sultan from 1503 to 1512.\(^{41}\) One remarkable but lesser known aspect of Bāyezīd II’s patronage and cultural politics is his benefaction towards the experts of astral knowledge.

While there was only one munajjim listed in the sole surviving register of payments from the later years of Meḥmed II’s reign, by the time of Bāyezīd II, the number, status, and salaries of the munajjims dramatically changed. Another payroll book – which must have been drafted sometime between 1490 and 1500, according to internal evidence – lists six munajjims that receive in sum 6068 akçes monthly, making an average daily salary of a court munajjim 33.7 akçes/day.\(^{42}\) Unfortunately the list does not specify the names of these munajjims, yet groups them as an individual unit (cemā’at-i münec-imīn) under the rubric of the monthly salaried palace personnel (müşâherehōrān).\(^{43}\) The famous register of allowances that thoroughly covers the last decade of the reign of Bāyezīd II also corroborates the information given in the payroll book. According to this voluminous register, at least 19 different names are recorded as munajjims, muwaqqits (time-keepers) or individuals presenting the court at different times with a

\(^{41}\) Atatürk Kitaplığı Muallim Cevdet O. 71. Various scholars have mined this voluminous register for different purposes. In addition to the works of Erünsal and Kazan cited above see Rifki Melül Meriç, Türk Nakış Tarihi Araştırmaları (Ankara: Ankaa Üniversitesi İlahiyat Fakültesi, 1953); idem., “Bāyezīd Camii Mimari, II. Bāyezīd Devri Mimarları ile Bazı Binalar, Bāyezīd Camii ile ilgili hususlar, san’atkarlar ve eserleri,” Ankara Üniversitesi İlahiyat Fakültesi Türk ve İslam Sanatları Tarihi Enstitüsü Yıllık Araştırmalar Dergisi II (1958), 4-76. The records for the first two years are also available as transliterated texts. See Ömer Lütfi Barkan, “İstanbul Saraylarına ait Muhasebe Deftleri,” Belgeler, 9/13 (1979), 1-380; Mustafa Açิกgöz, “II. Bāyezīd Devri İnamat Defteri (Muharrem-Zilhicce 910/Haziran-Mayıs 1504-1505)” (MA Thesis, Marmara University, 1996).


\(^{43}\) For the müşâherehōrān status, see Linda Darling, “Ottoman Salary Registers as a Source for Economic and Social History,” Turkish Studies Association Bulletin, 14/1 (1990), 13-33.

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taqwīm.44 Within these 19 names, at least five of them are listed under the monthly salaried palace personnel (mūṣāhereḥorān) rubric. Based upon these two registers, then, it is possible to deduce that there were five or six munajjims permanently employed at the court of Bāyezīd II at different times of his relatively long reign.

In terms of the number of munajjims who found steady employment at the Ottoman court, Bāyezīd’s reign supersedes not only those of his predecessor but also his successors’. For example, in a register from around the year 1514 during the reign of Selīm I, the unit of court astrologers (cemāʾat-i mūneccimān) is composed of four munajjims.45 Two different pay registers from the first years of the reign of Süleymān also list four munajjims under the rubric of the unit of court astrologers (cemāʾat-i mūneccimān). These munajjims are Seyyid Ībrahim b. Seyyid Mūneccim, Īshāk, Salmān-i Ājam, and Yūsuf b. ‘Ōmer el-Sā’atī, each receiving 15, 14, 13, and 10 akçes per diem respectively.46 In another register prepared slightly after these two registers, all three munajjims are listed with the exception of Salmān-i Ājam.47 It is also worth noting here that all these three munajjims, Seyyid Ībrahim b. Seyyid Mūneccim, Īshāk, and Yūsuf b. ‘Ōmer el-Sā’atī had started their careers during the reign of Bāyezīd II. Other archival documents from the later periods of the reign of Süleymān also confirm that the number of court munajjims remained stable for a while, before it dropped, by the later years of his reign, to two with further

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44 See Appendix A for the entire list of munajjims, muwaqqits, and other individuals cited in the register who presented the court with an annual almanac-prognostication and/or were rewarded for unspecified reasons.
46 TSMA D. 9706; TSMA D. 10141.
decreases in the amount of munajjims’ salaries. As we will see in more detail below in the special case of ‘Alī munajjim (better known as Riyāżī), the apparent decrease in the salaries and status by the mid-sixteenth century caused distress and uneasiness among some of the practitioners.

The unprecedented extent of the cultivation of celestial knowledge during Bāyezīd II’s reign was intimately related to his personal intellectual aspirations. From his years as governor in Amasya to his relatively long sultanate in Istanbul, Bāyezīd II actively sought expertise in the science of the stars, surrounded himself with a sizeable group of munajjims and scholars with deep astral curiosities, commissioned a number of treatises on different branches and genres of celestial knowledge, and spent his personal spare time on studying different forms and genres of the science itself. It was during his reign, for instance, that modest celestial observations with novel instruments were conducted in Istanbul. The Persian émigré munajjim, Khīṭābī-i Lāhijānī, whose works I will mention in greater detail below, conducted these observations in early 1480s

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48 BOA KK 1764 lists 4 munajjims between the years 933/1526-7 and 942/1535-6, but it is not certain whether these munajjims are members of the office or the register only records the names of experts presenting the court with a taqwīm. The munajjims listed in this register are respectively Lūṭfullāh, Yūsuf b. ‘Ōmer el-Sā’atī (noted as Sinān b. ‘Ōmer), Muslihiddin ṣākird-i (student of) Salmān, and Necmeddīn.

BOA MAD 559, a payroll book listing the names and wages of monthly-salaried palace personnel (mevācib-i müsāherehōrān), enumerates 2 munajjims for the year 942/1535-6 as part of the unit of cemā‘at-i müneccimān. These two munajjims are Ishāq and Yūsuf b. ‘Ōmer el-Sā’atī, receiving 14 and 10 akçes per diem respectively.

BOA KK 1864 reveals for the year 954/1547-8 only the name of Yūsuf b. ‘Ōmer el-Sā’atī as a court munajjim (‘an müneccimān-i ḥāṣṣa).

BOA MAD 7118, another payroll book for the monthly salaries of palace personnel, also lists for the year 955/1548-9 two munajjims as part of the cemā‘at-i müneccimān. These two munajjims are Yūsuf b. ‘Ōmer al-Sā’atī and Riyāżī ‘Alī, receiving 12 and 6 akçes per diem respectively.
to test the accuracy of three popular zijes used at the time. At least two different, extravagant astrolabes were cast for the sultan, one produced in the year 910/1504-5 by another Persian émigré scholar, Shukrullāh Shirvānī, and the second manufactured the following year by an apparently indigenous expert, al-Aḫmar al-Nujūmī al-Rūmī (d. later than 1505-6). The inventory of the palace library, which was compiled by the chief librarian Ṭāţūfī, is replete with treatises and textbooks on astrological principles, astronomical tables and instruments copied and dedicated to Bāyezīd II. Some of these items were even composed at the personal request of him.

The broad celestial interests of Bāyezīd II were so widely acknowledged during his own lifetime that contemporary émigré scholars and/or statesmen who had access to court circles often noted the sultan’s penchant for astral sciences in their writings. Andrea Gritti (d. 1538), the famous Venetian merchant and statesman who spent much of his early life in Istanbul and had

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49 Mortaza Somi and Mohammad Bagheri, “Risāla-i tashrīḥ al-ālāt fī ša‘n al-imtiḥānāt az Sayyid Munajjim Ḥusaynī,” *Mīrāth-i ʿIlm-i Islām va Īrān*, 2/1 (1392/2013), 181-205. Although the authors attribute the text to Sayyid Munajjim, an important early-fifteenth century astral expert from the Iranian world, this could not be true on the basis of the manuscript evidence of the works of both Sayyid Munajjim and Khiṭābī of Lāhijān. I will discuss this in more detail below.

50 David King, “Two Astrolabes for the Ottoman Sultan Bayezit II,” in *Essays in honour of Ekmeleddin İhsanoğlu*, v. 1, ed. Mustafa Kaçar and Zeynep Durukal (Istanbul: İrcica, 2006), 439-459. David King was not able to reach a decisive conclusion on the name of this scholar from Shirwan due to a paucity of information on Shukrullāh Shirvānī, who is different than Shukrullāh the physician at Meḥmed II’s court. In addition to the astrolabe, Shukrullāh Shirvānī also presented Bāyezīd II with a compendium of sciences (*Riyāḍ al-qulūb*), in which he discusses the meaning and benefits of *ʿilm al-nujūm* from exclusively an astrological perspective. See: SK Ayasofya Ms. 4024, 62b-80b.

51 Mīrīm Çelebi explains in the introduction to his commentary on the Ulugh Beg tables that he composed it upon the request of Bāyezīd II. See: SK Ayasofya Ms. 2697, 3b. In a similar vein, ʿAbdussalām al-Muhtadī says in his *Maʿrifat ḥaqiqat mawdūʿat al-kawākib* that he translated the work from Hebrew to Arabic upon the sultan’s personal request (*bi-talqīn al-sulṭān*) See: TSMK A. 3495, 88a.
close ties with the high-ranking members of the Ottoman court, writes in one of his reports to the Venetian senate that the sultan is considered a very learned person in *astrologia* and *theologia*, and that he studies these disciplines ardently in addition to his taking delight in the arts of mechanics and alchemy.\(^2\) Another contemporary testimony to Bāyezīd’s learned interests comes from one Ibn al-ʿUlayf (d. 925/1520), a noted poet living in Mecca, who had visited Istanbul and presented the sultan a panegyric long before he composed in Mecca a chronicle eulogizing the virtues of the Ottoman dynasty generally and Bāyezīd II specifically. In this chronicle, he details the scholarly character of Bāyezīd II and identifies the sciences the sultan endeavored to learn. Ibn al-ʿUlayf states that in addition to various branches of the religious sciences, including hadith and jurisprudence, Bāyezīd II was also interested in the science of the celestial spheres (ʿilm al-falak) and distinguished himself in the science of the stars (ʿilm al-nujūm) as well as geomancy (ʿilm al-raml).\(^3\)

It was also the case that many a scholar and *literatus* often opted to compose a work related to some form and genre of celestial knowledge as an initial attempt to ask for Bāyezīd II’s patronage. Firdevsī-i Ṭāvīl (d. later than 1512), for instance, made his debut in 1487 by presenting the sultan with his *Daʾvetnāme*, a work on celestial magic, whereas the Persian émigré scholar Qāḍī-i Baghdād, as we have already mentioned before, offered as his first gift to the sultan his almanac-prognostications for the year 913/1508 after taking refugee in the

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\(^2\) Marino Sanuto, *I diarii*, vol. 5, ed. Federico Stefani (Venezia: F. Visentini, 1881), 458: “Se dice delectarse de le arte mechanice...et haverse etiam delectà d’archimia.... Dicono esser ne la sua leze, in astrologia et theologia, secondo i suo’ auctori arabì et de persian quanto algum altro musulmano, et studia continuamente.”

\(^3\) SK Fatih Ms. 4357, 33b: “wa qāla li baʿḍ al-fuḍalāʾ al-Rūm ... anna al-sultān al-mushārūnilayh ... naẓara fi ʿilm al-falak wa baraʿa fi maʿrifat ʿilm al-nujūm wa-l-raml.”

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Ottoman lands upon the Safavid expansion toward Baghdad around the year 1507-8.54

The most intriguing of contemporary testimonies to Bāyezīd II’s genuine interest in the science of the stars, as well as in alchemy, is an anonymous letter sent by a seemingly Sufi shaykh that I already introduced in the first chapter.55 In this undated letter that casts light upon the learned interests of the sultan, the anonymous author refers explicitly to Bāyezīd’s endeavors to learn ilm al-hay’a along with another formidable branch of natural philosophy (ḥikmat), which he does not explicit.56 In his opinion, however, Bāyezīd did not have sufficient erudition and his attempt was made solely on the basis of experience (tajriba). It is the author’s desire to remind the sultan, whom he characterizes as a zealous servant in the path of Islam, of the transitory nature of life and the insignificance of worldly possessions.57 He then says that he has decided, in accordance with the portents in his dream, to send Bāyezīd one of his disciples to inculcate in him his real essence. The training should continue, the shaykh argues, until Bāyezīd attains the spiritual stage that his disciple has already reached at the hands of the master. Once Bāyezīd reaches that stage, then he, the author, will write a talismanic note for the sultan to help him gain

54 Firdevsi-i Tavil ve Da’vetname’si: İnceleme, Transkripsiyon, İndeks, Faksimile ve Mikrofış, ed. Fatma Büyükkarç (Cambridge, MA: Harvard University Near Eastern Languages and Civilizations, 1995); Qāḍī-i Baghdād, Taqvim, British Library Or. 6432/2. Qāḍī-i Baghdād’s name is recorded on the contemporary register of gifts and payments as the recipient on April 25, 1508 of 1,500 silver coins for his debut in presenting the sultan with his taqvim (ibtidā’-i ‘ādat-i Maylānā Sinān Qāḍī-i Baghdād ... ki taqvim āvord) Atatürk Kitaplığı Muallim Cevdet O. 71, 263.
55 TSMA E. 6172
56 Ibid., “[...] Mālik-i memleket-i Rūmiyye kim āl-i ʿOsmāniyeden Sultan Bāyezīd dir. Şöyle istimā’ olundir ki şina’at el-hey’ete ve bir ḥikmete ki ḥikmeti muhībdir tālmış ammā tecrübe tarikiylemiş vukūf yoğimiş.”
57 Ibid., “[...] Benüm üzerime lāzım oldu ki aŋa şefakat idüb tenbīh eleyem ... metā’-i dünvā kalīldir biz bundan raḥil ẓerine yez. İstiḥāre itdürum ḥayr ṣunda gördüm ki şākirdlerimden birini gönderem vara aŋa māddesin ta ’līm eleye.”
access to secrets.\textsuperscript{58}

This letter clearly shows, \textit{inter alia}, that Bāyezīd II’s preoccupation with different and less-approved branches of mathematical-philosophical sciences like the science of the stars and alchemy was duly noted by his contemporaries. As the phraselogy used by the anonymous shaykh implies, Bāyezīd II invested his time and energy to scientifically study the secrets of the heavens, which included not only the bookish learning but also the active observation and maybe even empirical study.

As to such a culture of observation and experimentalism at the court of Bāyezīd II, a Jewish émigré scholar close to the intellectual circles around the sultan provides captivating details. At the turn of the sixteenth century, Moses Galeano, or Mūsā Jālīnūs, a Jewish émigré physician and natural philosopher, who had devised a spring-wheeled robot and composed an astronomical book while he was in Istanbul in the proximity of the sultan and Mū’eyyedzāde, compiled a Hebrew-language compendium of knowledge entitled \textit{Ta’alumot Ḥokmah} (Puzzles of Wisdom). In this treatise, Galeano examines several errors and fallacies in the fields of various branches of knowledge including medicine, astronomy, and mechanics, and relates first-hand episodes about the courtly and scholarly culture around the sultan. Thanks to the fascinating studies of Tzvi Langermann and Robert Morrison on Galeano and his \textit{Ta’alumot}, we know that in the presence of Bāyezīd II and his close companion Mū’eyyedzāde were performed various types of experimental operations including alchemical ones.\textsuperscript{59}

\textsuperscript{58} Ibid., “[şakird] benden gördüğü mertebeye dek têdebîr eyleye. Ol mertebeye vâsîl olcak bañā i’lâm eyleye ben bir remz yazam ki kâşif ola ... tâ ki ṭarh-i iksire şâliîh ola.”

As it is manifested through such variegated contemporary evidence, Bāyezīd II was evidently interested in the cultivation of the celestial knowledge. His enthusiasm, however, was not only limited to patronizing astral experts or supporting those individuals who presented him a text or instrument. The anonymous Sufi shaykh, who complained in his petition about Bāyezīd II’s immersing in the study of the heavens, was not wrong in his implications, as at around the second half of the 1490s, Bāyezīd II called upon Mīrim Çelebi (d. 1525) to tutor him in the quadrivium (al-ʿulūm al-riyādiyya, i.e., mathematical sciences).

As the paternal great-grandson of Qāḍīzāda-i Rūmī and the grandson on the maternal line of Ṭalī Qūshjī, the two luminaries of the fifteenth-century mathematical-astronomical school of Samarqand, Mīrim Çelebi was the most important astral expert in the Ottoman lands at the turn of the sixteenth century. Although it is not certain when precisely Mīrim Çelebi was born, it was likely in the early 1470s after Ṭalī Qūshjī settled in Istanbul. Thanks to his ancestral prestige, as early as the late 1480s Mīrim Çelebi started to receive allowances as a member of the zavāʾidhorān class, peculiar to the sons of the prestigious ʿulamāʾ families. Taşköprüzade, who himself became a student of Mīrim Çelebi and read at his feet Ṭalī Qūshjī’s treatise on hayʿa, al-Risāla al-fathiyyya, briefly mentions Mīrim’s own training, reporting that he became a student of

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Treatise by Mūsā Jālīnūs alias Moses Galeano;” idem., “A Scholarly Intermediary between the Ottoman Empire and Renaissance Europe.”

In one such episode, an alchemist received the attention of the sultan after promising him that he can turn lead into gold. While the alchemist was conducting his operation, the rabbi Samuel Abulafia, one of the chief Jewish refugees from Spain at Bāyezīd’s court, asked Galeano to pass the sultan a note from Abulafia stating that the performance of the alchemist was a fraud. Upon reading the rabbi’s note Bāyezīd finally perceived his trickery. The alchemist then took his own life, drinking a lethal poison in the bathhouse. See: Langermann, “From My Notebooks,” 311-314.

İhsan Fazhoğlu, “Mirim Çelebi,” TDVLÀ.


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leading mathematicians of the time including Ḥācezāde (d. 894/1489) and Sinān Paşa (d. 891/1486). Mīrim himself reveals in his commentary on the Ulugh Beg tables that he worked with a certain Ḥāce Aṭā’ullāh (d. later than 1481), who was another Persian émigré scholar practicing astral sciences in the Ottoman capital in the late fifteenth century.62

Upon completing his madrasa education, probably in the early 1490s, Mīrim started teaching at several mid-to-high level madrasas in Bursa and Edirne. Around this time he was called by Bāyezīd II to be his private tutor and instruct him in the al-ʿulūm al-riyādiyya.63 The reasons are rather obscure about why Bāyezīd II selected Mīrim Çelebi to be his private tutor in ʿulūm al-riyādiyya while Mīrim was only an emerging scholar at the time, holding less prestigious teaching offices, but his exceptional family background must have been influential

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62 SK Ayasofya Ms. 2697. In this autograph copy of Dustūr al-ʿamal va tašḥīh al-jadval, Mīrim says (2a) that he was at the service of Māvlānā ʿAṭāʾullāh while his master was working on the Ulugh Beg tables. Interestingly, this little detail about ʿAṭāʾullāh is not included in other available copies of Mīrim’s own commentary of the Zīj-i Ulugh Beg: “[V]a ḥaẓrat-i marhūmī Khwāja ʿAṭāʾullāh dar ḫall-i ān say ‘karda baʿz-i az aʿmāl-i ān rā bā miślihi muvaẓzah gardānīda būdand va az ʿajāyib-i ittifāqāt, rūzī īn kamīna dar khidmat-i ān marhūm būdām va ʿishān ʿamālī mī gardand, kamtaṛīn goftam ki agar īn kītāb rā badīn dustūr sharḥī tamām navashta shavad dar gḥayat latāfīt khāhad bovad.”

63 Tašḵoprizāde, al-Shaqaʿīq al-nuʿ māniyya fī ʿulamāʾ al-dawlat al-ʿuthmāniyya, 135. During my research in the manuscript libraries of Istanbul and Europe, I was able to locate a single treatise on quadrants, written by a certain Ḥāce ʿAṭāʾullāh. See: SK Darulmesnevi Ms. 345. There is a colophon record on the last folio of the copy, yet the part where the date of composition reads is unfortunately cut from the bottom of the folio. The remaining part still allows us to establish the date of its composition as either the year 882 or 883. (1478 or 79).
for his appointment as the royal tutor for instructing mathematical sciences.

During his long service at the court, Mīrim Çelebi not only instructed the sultan in the mathematical sciences but also prepared almanac prognostications, composed textbooks on astronomical instruments, probably gave astrological advice on the spot, and helped train new generation of munajjims. As the catalogue of a certain Sotheby’s auction documents, Mīrim Çelebi produced at the time almanac-prognostications, two of which apparently survived our time, though they are now preserved in private collections unaccessible to researchers: one for the year 900/1495 and the other for the year 904/1499.64 Although we are currently devoid of extant Mīrim Çelebi taqwīms, that he composed at the time almanac prognostications is further corroborated by a minor payment register from early sixteenth-century recording Mīrim Çelebi’s name as the recipient of 1,000 akçes for a taqwīm he presented.65 In the year 904/1499, Bāyeẓīd also asked him to write a commentary on the Ulugh Beg tables to clarify its ambiguous points. In his dedication remarks of the text, which was more an expositional work on the concepts and parameters mentioned in the original Ulugh Beg tables than a revision of celestial data based upon fresh observations, Mīrim praises Bāyeẓīd II, among other ascriptions, as the most perfect and enlightened of the Caesars of the world (akmal va aʿqal-i qayāṣira-i ʿālam), as powerful as Alexander, who orders the affairs of the world in accordance with the rule of Farīdūn and the precepts of Plato (dhulqarnayn-shavkatī ki ba-ḥukm-i farīdūnī va ḥikam-i Aflāṭūnī asbāb-i

64 Information is accessible at http://www.islamicmanuscripts.info/reference/books/Sothebys-19941019/Sothebys-19941019-109-128.pdf
65 TSMA D. 9600. In the voluminous gift register covering the last decade of the reign of Bāyeẓīd II is Mīrim listed for numerous times but interestingly enough, none of these occasions are related to the presentation of an annual almanac-prognostication.
cihāngīrī sākht), and as the Messianic saviour of the end times (Mahdī-yi ākhīr-zamān). He repeats similar remarks in the epilogue (khātima) where he identifies Bāyezīd as the pādishāh of the inhabited world and the prophesied world ruler (ṣāḥib-qirān). Similar titulature is used in his works on astronomical instruments he composed in the first decade of the sixteenth century. For instance, in his work on the uses of the sine quadrant, Mīrim expresses his gratitude toward Bāyezīd II who is, as he puts it, the instrument for the prophesied world rule (vāṣīta-i 'aqt-i ṣāḥib-qirān) and the Messianic saviour in the end times (Mahdī l-raḥma fī ākhīr al-zamān). Even though Mīrim does not elaborate in his works on the celestial grounds of the titles he ascribes to Bāyezīd II, his resort to these concepts as a close companion of the ruler and a prominent expert of astral sciences is quite telling as to the extent of the discussion on the vocabulary of sovereignty in the late fifteenth and early sixteenth century Ottoman realm.

In view of the entries of the voluminous gift register covering the period 1503-1512, Mīrim was one of the closest companions of the sultan. Bāyezīd II even sponsored his wedding in 911/1505 and later gave Mīrim’s wife several items of clothing as a gift in the year 915/1510. Idrīs Bidlīsī, another important contemporary figure close to the courtly environment

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66 SK Ayasofya Ms. 2697, 2b.
67 Ibid., 263b.
68 TSMK Hazine 1760, 40b.
69 See Christopher Markiewicz’s dissertation that thoroughly discusses the vocabulary of sovereignty in the post-Timurid realm that found immediate reception in the late-fifteenth and early-sixteenth century Ottoman political and intellectual context: Christopher Markiewicz, “The Crisis of Rule in Late Medieval Islam: A Study of Idrīs Bidlīsī and Governance at the Turn of the Sixteenth Century,” esp. 311-341.
70 Atatürk Kitaplığı Muallim Cevdet O. 71, 159: in ām ba-Mawlānā Mīrim Čelebi barāy-i kharj-i 'urs-i khod fī 26 minhu (i.e., 26 CA 911/24 November 1505); Ibid.,368: 'ādat-i boğhcha-i zavja-i Mīrim Čelebi fī 10 minhu (i.e. 10 Z 915/19 February 1510).
of Bāyezīd II, also acknowledges the great esteem in which sultan held for Mīrim.\textsuperscript{71} Further evidence for Mīrim Çelebi’s proximity to Bāyezīd as a close courtier is the fact that during the pro-Selīm rebellions of the Janissaries in the capital in late 1511, Mīrim was among those high-ranking individuals who were targeted along with the chief military judge of the time Mūʾeyyedzāde (d. 1516), the chancellor Tāçīzāde Caʿfer Çelebi (d. 1515), and the chief physician Āhī Çelebi (d. 1524), on the grounds that they supported Bāyezīd’s favourite son Aḥmed against Selīm.\textsuperscript{72}

In addition to the taqwīms, the commentary on the Ulugh Beg tables, and the works on astronomical instruments, Mīrim Çelebi composed at least two treatises on two specific fields of astrology, namely elections (ikhtiyārāt) and interrogations (masāʾil). Although the colophons in the available copies of these works do not help us establish the date of their composition, Mīrim likely compiled them after the death of Bāyezīd II, as they do not include dedications to the sultan. In fact, Mīrim’s astrological works are geared more towards practicing munajjims who needed to advance their skills in the relevant techniques. In his work on interrogations (Taʿṣīrāt dar masāʾil), for instance, Mīrim handles all possible questions a client might ask a practicing munajjim, ranging from matters related to travelling on board to the fate of purchased slaves. In so doing, Mīrim shows his vast knowledge of the subject and frequently cites such names as Vettius Valens (Vālis), Hermes Trismegistus, and Māshāʾallāh, as the major authorities on this particular branch of astrological practice. Moreover, he encourages his readers to consult

\textsuperscript{71} Vural Genç, “Acem’den Rum’a: İdris-i Bidlisi’nin Hayatı, Tarihçiliği ve Heşt Behiş’tin II. Bāyezīd Kısmı (1481-1512),” 880: “bi-ṣohbat-i majlis-i humayūn az sā’ir-i ‘ulamā’ muntāz ast.”

\textsuperscript{72} Çağatay Uluçay, “Yavuz Sultan Selim Nasıl Padişah Oldu II,” İÜ Edebiyat Fakültesi Tarih Dergisi 7/10 (1954), 117-142, especially 120-121.
authoritative texts in this discipline such as al-Qaṣrānī’s *Kitāb al-masā’il* for further reading. He also mentions astrolabes and quadrants as major tools in the practicing *munajjim*’s toolkit, and argues that one of the most important reasons for inaccurate predictions on the part of *munajjims* are defects in these instruments that impair their accuracy.  

Mīrim Çelebi is also important for having trained several students in this field of knowledge some of which would later fill the professional cadre of court *munajjims* in the sixteenth century Ottoman establishment. One of these students was ‘Alī, who made his debut in drafting *taqwīms* in the year 912/1507. Unfortunately, the gift register does not provide any other details besides his personal name. There is a certain Muṣṭafā b. ‘Alī al-muwaqqit (d. 979/1571) who is also considered a student of Mīrim Çelebi. According to Salim Aydüz and İhsan Fazlıoğlu, Muṣṭafā b. ‘Alī al-muwaqqit held the office of chief *munajjim* in the second half of Süleyman’s reign, though archival registers we have available from the period do not cite any Muṣṭafā as a court *munajjim* at the time. No matter what his official status was, Muṣṭafā gained prominence especially through his treatises on geography and instruments of timekeeping. He also had close ties with the high-ranking statesmen of the time including Îbrahim Paşa or Ayas Paşa.

73 SK Bağdatlı Vehbi Ms. 2005, 10a: “dar ma rifat-i chīzīhā ki khaṭā dar masā’il az ān jihat vāqī’ mī shavad va ān chahār ast avval khaṭā dar masā’il bi-sabab-i khaṭā dar ālāt ... chūn uṣṭurlāb va rub’ mī bāshad.”

74 Atatürk Kitaplığı Muallim Cevdet O. 71, 211.

75 İhsan Fazlıoğlu, “Mustafa b. Ali el-Muvakkit”, *TDVİA*.

Another student of Mîrim, according to some contemporary biographers, was 'Özrî Çelebi, who is recounted to have excelled as an expert in casting birth horoscopes. 'Ăşık Çelebi (d. 1571) states that 'Özrî learned the intricacies of astrological practice at the hands of Mîrim Çelebi, but lost his life after Sultan Süleymân got enraged because of his displeasing astrological predictions. As 'Ăşık Çelebi narrates, 'Özrî composed his first and the only taqwîm while he was the judge of Varna. He delivered it to the palace during the ongoing siege of Rhodes in 1522. In his taqwîm, which is unfortunately not extant today, 'Özrî allegedly predicted that the island of Rhodes would eventually be conquered but the siege would be prolonged and cause the loss of many soldiers. Embittered by the predictions in the taqwîm, Süleymân asked his retainers to bring the author of the taqwîm into his presence. Upon hearing the sultan’s order, 'Özrî visited one of his close friends, Muştafâ the geomancer, who, according to 'Ăşık Çelebi, was also the student of Mîrim Çelebi (ḥâcedaşı ve fenn-i nücûmda pâdâşı). They together interpreted 'Özrî’s horoscope at the time and reached the conclusion that 'Özrî would die during his visit of the palace. According to 'Ăşık Çelebi’s anecdote, 'Özrî died exactly as foretold. While there are


77 'Ăşık Çelebi, Meşa’irü’ş-Şuara vol. 2, ed. Filiz Kılıç (İstanbul: Suna ve İnan Kıraç Vakfı, 2010), 1064.

certain doubts about the actual truth-value of this anecdote, it unequivocally shows, by highlighting Mīrim Çelebi as the master of both ʿÖzrī and his friend Muṣṭafā the geomancer, that in the eyes of later sixteenth century Ottoman learned class, Mīrim Çelebi still remained as the paramount expert of celestial knowledge.

As it is briefly mentioned before, another student of Mīrim Çelebi was Sultan Bāyezīd II. It is difficult to determine with greater certainty how long Mīrim Çelebi tutored the sultan and which books were involved in the study. One indication of the books Bāyezīd II likely studied with Mīrim Çelebi is a group of surviving manuscripts in which are found special inscriptions that curiously impute, in addition to the standard oval seal of the sultan, personal ownership of the book to Bāyezīd II (ṣāhibuḥu al-sultān Bāyezīd b. Muḥammad khan, or sometimes min kutub al-sultān Bāyezīd b. Muḥammad khan).

Works in astral lore comprise the overwhelming majority of surviving manuscripts that bear attestation to Bāyezīd’s own personal ownership. Those books Bāyezīd II personally possessed and possibly studied, either under the supervision of Mīrim Çelebi or on his own, include:

i. Naṣīr al-Dīn Ṭūsī’s Sī Faṣl, 79

ii. (Ṭūsī’s) Zīj-i İlkānī 80

iii. (Ṭūsī’s) Taḥrīr al-Majīṣī 81

iv. (Ṭūsī’s) Tadhkira fī ʿilm al-hay’a 82

79 SK Ayasofya Ms. 2474.
80 Bursa Türk ve İslam Eserleri Müzesi Ms. 11. I’m grateful to Zeren Tanındı for sharing the information on this manuscript.
81 TSMK A. 3328.
v. 'Alī b. Ahmad Balkhī’s (d. ?) astrological introduction in both the Arabic original and a Persian rendition (*Mukhtaṣar madkhal ilā ‘ilm aḥkām al-nuṣūm*). 83

vi. The Third Epistle of *Ikhwān al-Ṣafā*’ on the science of the stars. 84

vii. An anonymous treatise on the uses of astrolabe (*Risāla al-usṭurlāb al-musammā bi’l-lubāb fi’nuṣūm*). 85

viii. An introductory work in verse on astronomical/astrological calculation of time (*Kitāb yawūqit al-mawāqit min ḍiḥal al-nuṣūm*). 86

ix. Marrākushī’s (fl. second half of the thirteenth century) *summa* on astronomical instrumentation and computation of time (*Jāmiʿ al-mabādī’ waʾl-ghāyāt fiʿilm al-mīqāt*). 87

x. A collection containing Qustā ibn Lūqā al-Baʿlabakkī’s (d. ca. 912-913) treatise on the use of the celestial globe (*Risāla fīʾl-ʾamal biʾl-kura al-falakiyya*) as well as (pseudo-) Aristotle’s *Risāla al-ghālib waʾl-maghālib* (*The Victorious and the

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83 SK Ayasofya Ms. 2702.


85 SK Ayasofya Ms. 2618.

86 SK Ayasofya Ms. 2711.

Vanquished), a small treatise on a prognosticative technique employed to predict the outcome of a battle, which was quite popular among taqwīm writers.⁸⁸

Bāyezīd’s reading tastes and intellectual aspirations manifested through rich manuscript evidence, archival documentation, and testimony of his contemporaries seem to have embraced both the theoretical and practical iterations of the celestial knowledge including as well the strictly astrological (akhkām) ones. Apart from the books in his own possession that deal in principle with astrological principles, a few surviving archival documents also attest to the fact that Bāyezīd was quite eager to hear the astrological predictions of his munajjims. For example the undated, anonymous petition delivered to Bāyezīd II, which I introduced in the first chapter in the context of the discussion on the self-doubts of practicing munajjims, is a clear evidence of the sultan’s eagerness to heed the astrological advice. The anonymous munajjim asks in Persian for the sultan’s sympathy and forgiveness because, as he admits, he has recently failed to present the sultan with a taqwīm.⁹⁹ He also pleads with the sultan to reemploy him in his service, because apparently he lost his position due to his recent negligence in preparing taqwīms.⁹⁰ As such, the petition is a clear proof that Bāyezīd II inquired after, and waited impatiently for, the astrological counseling of his munajjims. Since failing to produce the annual astrological predictions in a timely manner potentially entailed a munajjim’s loss of position, Bāyezīd II must have given ears

⁸⁸ SK Ayasofya Ms. 2432.
⁹⁹ TSMA E. 10159/145: “dar īn ayyām mujassar na shud ki bi-istikhrāj-i taqwīm mashgūl shavad.”
⁹⁰ Ibid.: “az chand jihat yakī az ishtigāl bi-muţāla‘a-i țibbiyya ammā mānī‘i kullī ān ast ki īn kamīna rā vaqt-i irtihāl nazdīk ast va ishtigāl bi-nujūmiyyāt siyammā bi-akhkāmash mustalzim-i qasāvat-i qalb ast ... in kamīna rā ḥafmāyand va az rujū‘i khīdīt ki inshirāh-i şadr va tanavvur-i qalb bi-ān ast īn kamīna rā maţrūm nagodhārānd.”
to the astrological advice in the taqwīms.

III. 3. The Motives and Ramifications of Bāyezīd II’s Celestial Pursuits

What is the significance of Bāyezīd’s genuine and documented interest in different forms and genres of celestial knowledge? What could we say about the reasons of his reliance on the study of the heavens? How did his deliberate attempts to pursue and cultivate celestial knowledge result in?

Bāyezīd II was definitely not the first, nor the last Muslim ruler, who showed a keen interest in the production and use of celestial knowledge. As it is discussed in greater detail above, the patronage of munajjims was one of the standard themes of court life in medieval and early modern Eurasian context including the Islamicate and Ottoman world. The personal interest of a ruler in learning the science itself is also not entirely unprecedented in the Islamicate culture prior to Bāyezīd II. Aside from the examples in the Abbasid or Fatimid dynasties such as al-Maʿmūn (r. 813-883) or al-Āmir bi-Aḥkāmillāh (r. 1101-1130), Hülegū Khan (r. 1256-1265), for instance, was singled out for his avid interest in the study of the heavens. Writing in the fourteenth century, Abūʾl-Qāsim Kāshānī (d. ca. 1337) says that Hülegū, who initiated the construction of an observatory in Maragha, “loved science (ḥikmat) and was infatuated with astronomy (nujūm) and geometry (handasiyyāt).” 91 The Rasulid rulers of Yemen were also quite involved in studying the heavens. Al-Ashraf ʿUmar (r. 1295-6), for example, wrote at least two treatises, one on the general principles of astrology (Kitāb al-taḥṣīla fī ʿilm al-nujūm) and another on the use of astrolabes. 92 The second work was written as an accompanying text to an

91 Quoted in Thomas Allsen’s Culture and Conquest in Mongol Eurasia (New York: Cambridge University Press, 2001), 162.
actual astrolabe which al-Ashraf ‘Umar constructed.\textsuperscript{93}

The most famous of all the rulers in the Islamic history that showed a marked interest in learning and cultivating celestial knowledge is obviously Ulugh Beg (d. 1449). He gathered around his court in Samarqand a number of experts in mathematical and astral sciences from \textit{diyār-i Rūm} and \textit{Īrān-zamīn} such as Qāḍīzāda-i Rūmī, Ghiyāth al-dīn Jamshīd al-Kāshī, and ‘Alī Qūshjī, and utilized their efforts to run the celestial observations in the newly established Samarqand observatory. Ulugh Beg is documented in contemporary sources not only as a patron ruler but also as an active member of the scientific enterprises. In the letters of Ghiyāth al-dīn Jamshīd al-Kāshī to his father or the extant \textit{i̞jāza} given to Fathullāh Shirvānī (d. 1486) by his master Qāḍīzāda-i Rūmī, Ulugh Beg is often pinpointed as an active participant of the classes on mathematical/astronomical matters.\textsuperscript{94} Shirvānī’s \textit{i̞jāza} even eulogizes Ulugh Beg as the philosopher king (\textit{al-sultān al-faylasūf}) of the time.\textsuperscript{95}

We do not have conclusive evidence as to whether Bāyezīd II ever aspired to cast himself as a philosopher-king and create a court reminiscent of Hülegü’s or Ulugh Beg’s, welcoming experts of celestial knowledge from diverse regions. Yet this would not be surprising, considering the admiration for the Persianate, and specifically the Timurid, legacy in certain

\textsuperscript{93} He ultimately received an \textit{i̞jāza} from his teachers for making astrolabes skillfully. See \textit{Ibid.}, 44.
\textsuperscript{95} Fazlıoğlu, “Osmanlı Felsefe-Biliminin Arka Planı: Semerkand Matematik-Astronomi Okulu,” 43.
areas of the cultural and intellectual life at the Ottoman court during the period in question. Following the footsteps of his father, by promoting the Ottoman capital as a real haven for the systematic study of the heavens, Bâyezîd II aimed at reinforcing and publicizing the image of his ruling personality as well as the Ottoman dynasty as the most generous, dominant, and exalted power of the time. Indeed, Bâyezîd’s sustained efforts to cultivate the science of the stars neatly complement his endeavors to commission the first dynastic histories of the Ottoman House. As Halil İnalçık suggested long ago, Bâyezîd’s struggle with his brother Cem Sultan, which soon turned into an international crisis with the involvement of major European actors, and the competition in the east for political, ideological, and cultural supremacy against the Mamluks and various political/religious dispensations of the post-Shâhrukh period required a new evaluation of recent Ottoman achievements as well as Ottoman origins in line with the claims of a universal Muslim empire. Next to the deployment of history writing and chancery production for influencing the public opinion, the expertise of the munajjims in giving political


and military guidance and in “scientifically” validating the otherwise hyperbolic ideological claims might have mattered during this crucial transitional period of the Ottoman polity from a relatively minor regional power to a dominant political player.

As part of these claims to legitimacy, the court of Bāyezīd seems to have welcomed, if not fully adopted, experimentation with the messianic and esoteric discourse that would become particularly popular in the first two decades of the reign of his grandson, Sūleymān. The astrological writings of Ottoman munajjims at the time, however, do not appear to be much influenced by this discourse, with the exception of the works of Mīrīm Çelebi, who at times praises the sultan as the prophesied world conqueror and Messianic saviour of the end times. The real source for the articulation of such claims is rather courtly and semi-courtly historical works, exemplified by those of Idrīs Bidlīsī, Ibn Kemāl, and Firdevsī-i Ṭavīl.

Bidlīsī in his Hasht Bihisht singles out Bāyezīd as the messianic renewer (mujaddid) of the era, for his “turn” coincides with the turn of the tenth Islamic century. He heavily resorts to astrological references when celebrating Bāyezīd’s rule as the greatest one of his age. In eight separate discourses Idrīs explains the underlying reasons of Bāyezīd’s distinguished status, and in particularly the sixth discourse he goes into purely astrological details. For Idrīs, Bāyezīd was the ideal ruler because in the eyes of the munajjims, Bāyezīd’s horoscope —compared to the

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horoscope of any other king— is the supreme one in auspiciousness (ṯāliʿ-i ḥumāyūn-i sulṭān bi-ittifāq-i munajjimān saʾādatmandtarīn ṭāliʿ hā-yi shāhān ast).\(^{100}\) Idrīs goes into further detail here and points out the exact astrological parameters of Bāyezīd’s birth horoscope. According to Idrīs, Venus rules the ascendant (ṯāliʿ) of the sultan, the planet that signifies the prophethood and sacred law. Other important indications related to the twelve astrological houses also imply for the sultan, as Idrīs maintains, nothing shorter than a steady state of health, strong natural disposition, and perfect rule.\(^{101}\) As Idrīs concludes this section, all of these astrological indications are the signs of Bāyezīd’s preeminence over other rulers in the world.\(^{102}\)

Apart from Idrīs, Ibn Kemāl also quite frequently employs in his chronicle the term sāḥib-qirān for designating Bāyezīd II, though he does not necessarily discuss the astrological reasoning of this title.\(^{103}\) Most intriguing in this context is Firdevsī-i Ṭavīl’s Ḭūṭnāme, which he composed in 909/1503 as a lengthy history in verse of the recent Ottoman victory in Lesbos against the Venetians. Although it is clear that Firdevsī was not among the favorite littérateurs of Bāyezīd, partly due to his lack of necessary elite identity markers (he preferred to write in plain Turkish), he exerted all his efforts from 893/1488 onwards to catch the attention of the sultan by exploiting Bāyezīd’s interests and promoting his rule. His Ḭūṭnāme was written with similar intent and served to celebrate Bāyezīd’s recent achievements. The real significance of the text

\(^{100}\) SK Nuruosmaniye Ms. 3209, 497b, quoted in Markiewicz, “The Crisis of Rule in Late Medieval Islam,” 379.

\(^{101}\) Ibid., 497b: “az kamāl-i inṭīzām va quvvat-i mizāj bi-iʾtiḍāl va az imtādād-i šīḥḥat-i badan az bidāyāt-i ḥāl māʾlūm mī shavad ki burj va daraja va sāḥib-i ṭāliʿ ki bi-tāʾayyun Zuhra-i masʿūd ast ya dar āṭāʾ ya bi-nazar-i saʾādat-i lāmiʿ va vufūr-i taqvā va ʾiffat-i sulṭānī dālīl-i khosh-ḥālī-rabb-i ṭāliʿ ast charā ki kavkab-i nubuwwat va nāmūs-i nabavī Zuhra-i saʾīd ast va sitāra-i šalāh va taqvā najm-i masʿūd-i Nāḥīd ast...”

\(^{102}\) Ibid.: “va ṯāʾum jumla ṯalāʾ išārāt-i jihān-i bar mulūk-i jihān va sabab-i rujhān-i bar khojasta-tāliʾīn ṯāʾūn-i dāvrān.”

derives from Firdevsi’s heavy use of apocalyptic imagery with detailed references to contemporary European powers. In the same vein of Idris and Ibn Kemal, Firdevsi attempts to cast Bâyezid as the prophesied ruler of the age, the *qutb al-aqtâb* (pole of the poles) of the time.\(^{104}\) The notion of the “red apple” (*kızıl elma*) that symbolizes the Ottoman millenarian desire to conquer Rome is also frequently employed in the text.\(^{105}\)

*Kuṭb-nâme* was not the only textual evidence for the perpetuation of the millenarian “red apple” discourse at the court of Bâyezid II. In an anonymous dream report likely written by an individual from the class of frontier *ghâzî*-dervishes, the author states that he saw the sultan Bâyezid in his dream, sitting next to Seyyid Gâzî, the legendary dervish warrior. Seyyid Gâzî then apparently turned the author and said: “Behold, I have brought Sultan Bâyezid ready for your service. Let him conquer westwards unto the *red apple* and establish the dominion of Islam.”\(^{106}\)

As these last two examples suggest, the political ambitions and cultural aspirations at the court of Bâyezid II were not only shaped by the political, ideological, and cultural rivalry within the Islamic world but also formed in relation to contemporary European powers. Although the


\(^{105}\) See especially pp. 75-77.

\(^{106}\) TSMA E. 10818, also quoted in Selahattin Tansel, “Yeni Vesikalar Karşısında Sultan İkinci Bayezid Hakkında Bazı Mütalaalar”, *Belleten* 27/106 (1963), 208: “*İşte sana Sulṭân Bâyêzîdî koşdûk. Al ilet gün bâţûsîna kîzîl elmaya değin feth idûb İslâm döşeğin döşesûn.*” 203
majority of scholarship on the reign of Bāyezīd II tends to portray his stance vis-à-vis the political and cultural dynamics in Europe as anemic and idle, this was simply not the case. Especially during the first two decades of his reign when the Cem Sultan affair became an international crisis, Bāyezīd carefully engaged a busy network of spies and informants who acquainted the sultan not just with the political issues but also likely with the cultural preferences at major European courts.\textsuperscript{107} One of these courts was that of Mathias Corvinus (d. 1490) with whom we know Bāyezīd had established close relations and exchanged numerous letters based on the principles of “friendship and good neighborhood.”\textsuperscript{108} Although the content of these frequent diplomatic correspondences between Bāyezīd and Mathias Corvinus, the ideal Renaissance monarch of his time, are primarily slanted towards political and commercial issues, it is likely that these communications also informed the newly enthroned Ottoman sultan about Corvinus’s court culture, his patronage of astrologers, and the exemplary Biblioteca Corviniana, which thus might have served to inspire his Ottoman counterpart to undertake similar pursuits.\textsuperscript{109}

Apart from the ideological implications and political instrumentality of the royal

\textsuperscript{107} Halil İnalcık, “A Case Study in Renaissance Diplomacy: The Agreement between Innocent VIII and Bāyezīd II on Djem Sultan,” \textit{Journal of Turkish Studies} 3 (1979), 209-223.


patronage for *munajjims*, Bāyezīd II might have also deployed the expertise of celestial knowledge for more tangible and mundane aspects of governance such as land and maritime navigation. As briefly mentioned above, the technical know how of the experts of the science of the stars included, besides astrological estimations and predictions, the use of instruments as well as horological, latitudinal and longitudinal calculations. The current state of the literature on the military and maritime history of the Ottoman house does not allow us to draw any firm conclusions about the possibility of interplay between the simultaneous buildup of the navy and the cultivation of the science of the stars at the court of Bāyezīd II.¹¹⁰ However, as studies on the development of the Portuguese naval technology in the later fifteenth century have suggested, the contemporary study of the heavens tallied with the advancement of the nautical sciences.¹¹¹ Indeed, that the Ottoman sixteenth century produced figures like the admiral Seydī ’Alī (d. 1562), who prolifically wrote on astronomical instruments and mathematical geography, indicates that similar research into the mutual relationship between the science of the stars and the art of navigation in the Ottoman context is a major desideratum.¹¹²

¹¹⁰ Bāyezīd II is also credited for his endeavors to reorganize the Ottoman navy and create a stronger sea force with better technology. See Hans Joachim Kissing, “Betrachtungen über die Flottenpolitik Sultan Bājezīds II. (1481-1512), *Saeculum* 20 (1969), 35-43; Palmira Brummett, *Ottoman Seapower and Levantine Diplomacy in the Age of Discovery* (Albany, State University of New York, 1994), esp. 89-121.


¹¹² As briefly discussed in chapter two, Piřī Reis’s use of the epithet *munajjim* for Christopher Columbus neatly exemplifies the intimate connection between the seemingly two separate fields of expertise, i.e., the science of the stars and the art of navigation. In fact, Seydī ’Alī and his oeuvre wait to be thoroughly studied from the perspective of the intersections among navigation, astronomical instrumentation, and prognostication. In his *Kitābu’l-muḥīṭ*, for instance, Seydī ’Alī does not shy away from informing his readers (i.e., *müblediler*) [young and inexperienced
No matter what the exact motives of the sultan and his close companions including primarily of Mūʾeyyedzāde and Mīrīm Çelebi were for the documented astromenia at his court, the evident enthusiasm for the study of the heavens at his time paved the way into: i) the systematization of the “office” of court munajjims that would routinize the recruitment of experts and facilitate the transmission of astrologically valid knowledge across subsequent generations

seafarers]) about i) the detrimental affects of the apperarence of certain stars (e.g. ʿṢūkūr yıldızı), ii) the main characteristics of the planets and the days they rule (e.g., “her saʾʿatı̂n śāhībi ḵanḵ kevekebdür ma lūm idinīb ḵanḵ sāʾate sefer olunmak cāzīdūr ve ḵanḵ sāʾate cāzīz degūldür”), or iii) the direction in which the rijāl al-ghayb would show up in certain days of each month (e.g., “ḥaẓret-i Şeyh Muḥyīddīn-i ʿArabī ... ricālīʾ-gayb her ayyūn ḵanḵ guñlerinde ne cânībededīr ta ʿyīn itimīdūr ma lūm ola.”) In his Mirʾāṭīʾ-ʾl-memālīk, Seydī ʿAlī also narrates in detail that the Mughal ruler Humāyūn (r. 1530-40; 1556-6) asked him to spend the winter in his palace and teach him how to use zijes and taqwīms as well as other astronomical instruments. See Mirʾāṭīʾ-ʾl-memālīk: inceleme, metin, indeks, ed. Mehmet Kiremit (Ankara: Atatürk Kütür, Dil ve Tarih Yükse Kurumu, 1999), 109-110: “‘bir yl bāri bunda bizīm ile ol’ diyy ibrām idīb bu kēmīne dāhī cevāb virūb ‘sāʿādetlū pādīşāhunı̂ emr-i ʿerifı̂ ile deryāyā çūṭb kūffār-ī ḥāk-sār īr cēn idīb ve ṭūfān īr diyār ī Hind’ ī dūsūb benūm der-i devlete varvam lāzīmdur ki kūffār-ī ḥāk-sāruñ ahvālī devletlū pādīşāhā ma lūm olub...’ didūkde ‘Pādīşāh ḥazretlerine elçī irsāl idīb seniūn ‘ezrūn ‘arz olsun’ diyy ṭuynurduklarında ... envāʾ-ī taẓarru ve niyāz olinıldı ka ruḥṣat ‘ināyet olunub ‘Ammā ʿuc āy biriškāl ya'ın bārān zamāndur. Yollar šīdūr. Gidilmek mūmkin degūldür. Ol zamāna dek tevākkuf eyle ve ‘amel-i kūsūf ve ḡusūfī zīce ve takvīm-i kūffīye mūrāca at ol demden uṣṭurlūb ‘amelī ile taṛīkin ġostēr ve daire-i muʾaddil risālesin ta ʿlīm eyle. Eger āc aydan evvel olursa dāhī ruḥṣatdūr’ diyy ‘ahd ā amān idīb biʾ-ḥarūrī tevākkuf olunub gīmekden me yūs olub...ammā ne gicemīz gice ve gūndızımız gūndūz, āslā rāḥat yūzīn gōrmeviyā ahīr pādīşāhā zīk rīl olan risāle min evveli īlā ahīrīhī ta ʿlīm olunub ve ‘amel-i kūsūf ve ḡusūfī uṣṭurlūb ‘amelī ile ḡosterilūb ...”

As Seydī ʿAlī’s remarks demonstrate, seafarers often appealed to the technical texts on the uses of astronomical instruments, calendar conversion, or general astrological principles. One curious marginal note in a surviving mecmūʾa of astrological and astronomical texts, now housed at the BnF, conveys the invocation of an anonymous seafarer, who supplicates for God’s help on behalf of his fellow sea ghazīs. See BnF Turc Ms. 186, 7a-7b: “[D]uʾa idelūm...ricālīʾ-gayb hemmetleri ve şefāʿatleri überümüze ve überünmüze hāzīr [sic] ve nazīr [sic] olmakleğiçin ... kāfi̇rde esir olan müselmānlar ḥakk sūbhānehve ve te ʿalā ḥalāšlik [sic] alîvırmeğiçin, seferimiz daší miḥāre olub gâzîlerımızm gânimine müstagrak doyum olmakleğiçin ve ḥakk sūbhānehve ve te ʿalā ġanîmetler virûb âsānlık ile vaṭānanlara ʿsāl idîvırmeğiçin ... ve ḥakk sūbhānehve ve te ʿalā gemiciğiçiz belâ ve ḥaṭādan şakîlyûvırmeğiçin ve kūffār-ī ḥāksār-ī bed-fi ʿal[i] ḥakk sūbhānehve ve te ʿalā mūnhezim idīb ...”
of *munajjims*, and ii) the appropriation and further canonization in the Ottoman world of the post-thirteenth century Persian astral tradition that would shape the scientific contours of the practitioners.

As regards to the formation of the office of the court *munajjims*, we lack substantial evidence to illuminate the exact historical context of the transition from ad hoc functionaries to permanent office-holders, but as mentioned before, the earliest archival registers at hand document that during the early years of the reign of Bāyezīd II, the number of *munajjims* receiving regular salaries from the court significantly increased from one to six. Moreover, based upon the same archival registers, the status of *munajjims* within the nascent court bureaucracy also changed. Whereas at the end of Meḥmed II’s reign the only *munajjm* listed in the paybook was recorded within the miscellaneous *mutafarriqa* corpus, from the time of Bāyezīd II onwards court *munajjims* started to be listed among other monthly-salaried palace personnel (*mūşāherehorān*) next to the physicians, chancelleries, or artisans (*ehl-i hiref*). Not but not least, compared to the reigns of his predecessor and successors, Bāyezīd II’s time was the period during which the amount of salaries court *munajjims* received were at the highest level.

The courtly interest in the services of *munajjims* maintained during the time of Selīm (r. 1512-1520). As far as the contemporary archival and manuscript evidence is concerned, Selīm was not much shorter than his father when affinity toward celestial expertise is in question. At his princely court in Trabzon, for instance, he had one particular *munajjm*, who used to receive 800 *akçe* for his annual presentations of almanac-prognostications.\(^{113}\) He also seems to have retained, upon his enthronement in the capital in 1512, the *munajjims* active at the court of

\(^{113}\) TSMA 10184. Unfortunately, the document does not reveal his name, thus we are not in a position to detect whether this particular *munajjm* accompanied Selīm in his move to Istanbul.
Bāyezīd II. Contemporary narrative sources also allude to Selīm’s taking the expertise in celestial matters quite serious. For example Ḥakīm Shāh Muḥammad Qazvīnī (d. later than 1523), who emigrated from the western Iran to the Ottoman lands in the early sixteenth century and served Selīm I in the capacity of court physician, goes on to say in his Persian translation-cum-addendum of ʿAlī Shīr Navāʾī’s Majālis al-nafāʾ is that Selīm inherited from his father the interest in the mathematical sciences (ʿilm-i riyāżī). Another contemporary source, Keşfī Meḥmed Çelebi’s (d. 1525) Selīmnāme, vividly illustrates how Selīm was moved by the advice of the munajjims. According to the eyewitness account of Keşfī Meḥmed Çelebi, Selīm was eager to initiate a campaign against the island of Rhodes, but after hearing – or maybe reading – the words of munajjims who reached a consensus in their taqwīms that the beginning and the middle of the year would be extremely inauspicious, he decided to abandon his campaign plan.

As for the reign of Süleymān, one would have expected a better documented courtly interest in astrological matters given the increased use of messianic discourse in the articulation of his ideological/imperial claims, the frequent circulation in his palace of key texts of apocalyptic prognostications including ʿAbd al-Raḥmān al-Biṣṭāmī’s Miftāḥ al-Jīfr al-Jāmī, or the close proximity of a particular geomancer (remmāl) to the sultan. However, as already

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114 TSMA D. 9706; TSMA D. 10141.
115 Ḥakīm Shāh Muḥammad Qazvīnī, Tazkirah-i majālis al-nafāʾ is, ed. ʿAlī Asghar Ḥikmat (Tehran: Kitābfurūsh-i Manūchihrī, 1363), 360: “faẓāʾ il-i ʿilmī-ī ān ki dar ʿilm-i riyāżī ki misl-i saltanat-i mīrāṣī-ī ā ast māhīr būd.” It is worth noting here the Qazvīnī’s emphasis upon Selīm’s adoption of the legacy of Bāyezīd II in the cultivation of astral interests.
116 SK Esad Efendi Ms. 2147, 133b: “ve hem ehl-i nîcûm-i mütefîkân ʿalehî bu yîlîn evâlîlı ve evâsîtî gâyetde şûm ve nihâyetde mezmûmdur diyû takvîmlerinde tâhrîr ... kîldîlar. Ol sebebden sefer emri te ğîrîr buyuruldı.” More discussion and the parallel reading of the original taqwīm from the year in question will follow in Chapter 4.
117 On the role of ʿAbd al-Raḥmān al-Biṣṭāmī on the formation and articulation of Ottoman dynastic claims in the late fifteenth and early sixteenth century, see: Cornell H. Fleischer, 208
mentioned in the first chapter, despite several overlapping points between the expertise of a munajjim and other types of diviners such as an adept practitioner of the science of letters (ʿilm al-ḥurūf) and/or a geomancer, the technical mathematical details of the learned astrological practice were often disregarded in non-astrological divinatory texts. As Ottavia Niccoli’s work on the role of prophetic texts in Renaissance Italy has persuasively demonstrated, such mathematical precision and taxing calculations to determine celestial positions at a particular time for a specific location might have sounded too complex and less prophetic for many a contemporaries.\textsuperscript{118} It is true that these kinds of texts, like the astrological ones, almost always relied upon the assumed causality between heavenly forces and terrestrial occurrences. Nevertheless, none of the experts of the science of letters or geomancy were willing or capable (or sometimes both) to practice the learned forms of mathematical astrology. In fact, as manifested in remmāl Ḥaydar’s surviving treatises and specific reports where he details the application of the science of geomancy, the complicated mathematical calculations of horoscopes or any other celestial position play little to no role.\textsuperscript{119} In that regard, at the current stage of modern literature and available sources, we can argue that during the time of Süleyman, especially in the first half of his reign, the interest in the study of heavens was rather shifted from the more learned practice of mathematical astrology to the lettrist interpretation of the celestial


\textsuperscript{119} See for instance SK Laleli Ms. 1532, 45b-108b; TSMK Hazine Ms. 1697; TSMA E. 1698.
knowledge, which does not much require the precise observations and/or calculations. One could even corroborate this shift by tracking the gradual decrease in the number of court munajjims during the long reign of Süleymān. While the number of monthly-salaried court munajjims was four in the first few years of Süleymān, it first dropped to three in the early 1530s before it was ultimately reduced to two in the late 1540s.\footnote{BOA MAD 7118. Ḥaydar-ı \textit{remmāl}’s reports and writings in the 1550s also reveal that, compared to the 1520s and early 1530s, the prophetic ambitions and use of prognosticative methods no longer played an important role at the time. See: Cornell H. Fleischer, “Shadow of Shadows: Prophect and Politics in 1530s Istanbul,” \textit{International Journal of Turkish Studies} 13/1-2 (2007), 61.}

Notwithstanding the gradual decrease in the number of court munajjims put on the palace payroll and the concomitant decline in the amount of the production of astrologically valid knowledge, the idea of a permanent “office” of court munajjims helped practicing astral experts in two major ways. Firstly, it secured a relatively stable financial means, though by the mid-sixteenth century, it was not very lucrative, much to the chagrin of some contemporary practitioners. Secondly, and more importantly, it provided a sort of “membership card” through which affiliated ones enjoyed easier access to the books and instruments available in the palace treasury. As we have already seen in the second chapter, one of the court munajjims asked Bāyezīd II to gain access to some of the items in the treasury (\textit{khizāne}) including the Ulugh Beg tables, the commentary of Naṣīr al-dīn Ṭūsī on Ptolemy’s \textit{Almagest}, the horoscope of the sultan (\textit{ṭāliʾ-i ḥazret-i ālem-penāhī}) and an astrolabe.\footnote{TSMA E. 10159/6.} Another archival register prepared on 10 Shaʿbān 910/January 16, 1505 lists for example all the items available at the time in the inner treasury (\textit{ḥazīne-i Enderūn}). Among these listed items are there numerous quadrants (\textit{rubʿ dāʾire}), several celestial globes (\textit{heyʿet topu}), at least sixteen astrolabes preserved in velvet cases
(on altı büyük ve küçük kadife gilâf içinde suṭurlâb), one European clock (Frengî sâ’at), and other sorts of astronomical instruments (ālet-i rücû’-î kevâkib). Given the higher costs of owning such astronomical instruments, the status of court munajjim must have mitigated the problems of accessibility.

Although it is not possible to speak of a physical space in the palace specifically designated for the court munajjims, bearing the rank of “court munajjim” and being listed in the bureaucratic records along with other colleagues might have also promoted the group ethos as much as it provoked professional rivalries. As exemplified further below, many a times members of the “office” were tied to one another through family bonds and/or master-apprenticeship relations. This must have facilitated and even routinized the transmission of the required knowledge to subsequent generations of court munajjims.

In terms of the recruitment of adept munajjims, especially in the earlier phases of the functioning of the “office” by the late fifteenth century, the émigré scholars coming from the Persianate East seem to have had a decisive role. Despite the valuable contributions of Hanna Sohrweide or Tofigh Heiderzadeh on the Persian émigré scholars and litterateurs in the Ottoman world in the fifteenth and sixteenth century, we are still far from establishing their identities and appreciating their role on the cultivation of cultural and intellectual life in the Ottoman realm.

Who was Mevlânâ Küçek Yezdânbaḥş for instance? Where did he come from? To what extent

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122 TSMA 10026.
was he related to Mawlānā ʿAṭāʾullāh, who apparently came to Istanbul from Kirman around the same time? Who constituted those two hundred people that allegedly accompanied ʿAlī Qūshjī in his recounted arrival in early-1470s Istanbul?124 What kind of books and instruments did they bring? How did they interact with local scholars and young aspirants of celestial knowledge?

In the current state of scholarship, it is difficult to provide substantial answers to each and every one of these questions. Nonetheless, available manuscript and archival sources suggest that the late-fifteenth century is a vibrant period in terms of the circulation of scholars and intellectuals between the lands of Irān and Rūm. It is true that the history of intellectual exchanges and movement of scholars between these regions could easily be traced back to the thirteenth and fourteenth centuries. Yet, the power struggle in the post-Shāhrūkh political context of the late fifteenth-century Iran particularly encouraged an influx of scholars into Ottoman domains (as well as the Indian subcontinent) even as the generous patronage policies of Meḥmed II and Bāyezīd II to establish the Ottoman dynasty as a legitimate power offered the intellectual émigrés incentives for migration. Before the gradual territorial and confessional consolidation of the Ottoman and Safavid Empires in the course of the sixteenth century, political instability and confessional ambiguity facilitated the high circulation of scholars from Central Asia and Iran to Ottoman lands in Anatolia and the Balkans. As part of this wave, several Persian émigré scholars that had the expertise in different forms and genres of celestial knowledge ended up in the Ottoman lands, whereas various would-be munajjims in the Ottoman lands who were looking forward to advancing their knowledge in astral sciences went to Iran-zamīn. It is in order now to share the personal stories of some of the active munajjims in the Ottoman realm in the late

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124 For the story of two hundred people accompanying ʿAlī Qūshjī during his travel to Istanbul, see Süheyl Ünver, Ali Kuşçu hayatı ve eserleri, 17.
fifteenth and first half of the sixteenth century. The manuscript and archival evidence on these select names, albeit limited, will help us better substantiate the already raised points as regards to the social history of munajjims and the appropriation of the Persian astral tradition in the Ottoman world.

III. 4. Individual Stories of Select Munajjims

Unlike contemporary European context in which different stages of the careers of astrologers could easily be reconstructed in light of substantial and diversified source base, it is quite difficult to hear the voices of practicing munajjims in the fifteenth and sixteenth century Ottoman realm. Not only the contemporary biographical dictionaries of scholars and/or poets often remain silent about them. In the surviving astrological and other related materials of Ottoman munajjims themselves, they reveal too little valuable information about their own lives and careers, their training and scholarly networks, the patrons they served, their success and failures as well personal resentments.

One exception is the story of ʿAbd al-Raḥmān munajjim, which presents us an invaluable case to bear witness to the making and breaking of a career of an Ottoman natural philosopher-cum-astrologer by the turn of the sixteenth century. ʿAbd al-Raḥmān also supplies the only detailed autobiographical narrative of a practicing munajjim at the time that provides further glimpses of evidence into different aspects of a munajjim’s life, from his training and initiation into courtly service to the gradual shift of his scientific preoccupations as a response to the
changing priorities of his patron.\textsuperscript{125}

In his medical treatise that he composed in Arabic and presented in February 1502 to Şehzade Aḥmed (d. 1513), the living eldest son of Bāyezîd II settled in Amasya, Ṭabd al-Raḥmān mentions his training in varying branches of natural philosophy and mathematical sciences, and illustrates his wavering relationship with his major patron, Şehzade Aḥmed. According to this short autobiographical narrative that he placed in the introduction of the text, he started studying the science of the stars (ʿilm al-nujūm) under Mevlânâ Kûçek Yezdânbaḵş, whom we have already seen as the only court munajjim listed in the detailed register of payments from the later years of Meḥmed II’s reign and as the composer of the Zīj-i mujmal that he presented to prince Bāyezîd II in Amasya around the year 1477. Unfortunately Ṭabd al-Raḥmān does not reveal here in which city and under what circumstances this training took place. He further mentions that having completed his initial training in the science of the stars with the only recorded court munajjim of the time, he studied medicine for about ten years at the feet of Ḩakîm Īṣḥaḵ, whom he introduces as the Hippocrates of the day, Socrates of the time, Galen of the age, and Ibn Sīnā of the era.\textsuperscript{126}

\textsuperscript{125} The Mücerrebāt of Muştafa Zekî, one of the chief court munajjims in the eighteenth century, provides us with surprising autobiographical details about his life. Apparently he started his service in the office first as a petty scribe (erkām kātibi) putting the abjad numerals into the taqwīms. Since the date of this text’s composition falls into much later periods than covered in this dissertation, I did not use it here. See: SK Ḣarşaf 485.

\textsuperscript{126} SK Ayasofya Ms. 3635, 2a-2b: “qad kāna mushtagilan bi-ʿilm al-nujūm wa taʿallama min [al-]ustad al-kāmil al-munajjim Yazdânbakhsh al-mushtahîr bi-Kūchak wa baʿdahu ḥaṣṣala ʿilm al-ṭibb ʿashra sana wa qara a kutub al-ṭibb min aʿẓam al-ḥukamāʾ wa akmal al-fuḍalāʾ wa Buqrāṭ al-waqt wa Suqrāṭ al-ahd wa Jālinūs al-zamān wa Abū ʿAlī al-davrān wa-al-ḥakīm al-fāḍil wa al-ṭabīb al-hādhiq al-makhṣūs bi-ʿināyat al-khālāq Khawāja Ḩakīm Ishaq.” Taḵkörprzâde briefly mentions this Ḩakīm Ishaḵ and says that he was a physician with Christian origins, who studied with the famed Mollâ Luṭfî philosophical sciences (al-ʿulûm al-hikamiyya). He later converted to Islam and abandoned his earlier interests in philosophy and medicine.
Later begins his relationship with Şehzade Ahmed who took notice of 'Abd al-Rahmān and recommended that he go to the Iranian lands (vilāyat al-'Ajam) to advance his knowledge in the science of the stars. Following his patron’s advice, ‘Abd al-Rahmān went to Iran and studied under a certain Sayyid Ni’matullāh Shirāzī, whom he describes as the exemplary model of the philosophers, the chief of the munajjims (sayyid al-munajjimīn), Naṣīr al-Dīn Ṭūsī of the time, and Ptolemy of the age. Upon improving his expertise in this science at the hands of Ni’matullāh Shirāzī and getting to grasp its secrets, he returned the princely court of Şehzade Ahmed in Amasya, probably in the late 1490s, and started serving him as a munajjim in the lower echelons of Ahmed’s court bureaucracy. However, as he puts it forward, he waited impatiently for five years to receive a promotion, as he thought he deserved a better position with generous allowances due to his prominence in the science of the stars. Nonetheless, he realized that Şehzade Ahmed’s attention began to shift at the time from the science of the stars toward medicine. According to ‘Abd al-Rahmān, the prince started to treat physicians more generously no matter how ignorant they were regarding medical issues. That is the reason, as ‘Abd al-


Although I have had recourse to Reza Pourjavady’s important study on the lives of the philosophers in Shiraz at the turn of the sixteenth century and also looked at Shiraz-based biographical dictionaries, I have not been able to come across any information on Ni’matullāh Shirāzī. See Reza Pourjavady, Philosophy in Early Safavid Iran. Najm al-Dīn Maḥmūd al-Nayrüzī and His Writings (Leiden: Brill, 2011); Mīr Taqī al-Dīn Kāshānī, Khulāṣat al-Asl ār wa Zubdat al-Ajkār: bakhsh-i Shīrāz va navāh-i ān (Tihrān: Markaz-i Pīzhūhishī-i Mīrās-i Maktūb, 2013).

128 SK Ayasofya Ms. 3635, 3a-4a: “thurma jā’ā ilā ṣāhīb ‘atabaihi al-‘āliyya … wa tawaqqaqa ṣābiran khamsa sinīn wa qad kāna yarjū an yataraqqi bi-sabab ‘ilm al-nujūm ilā marṭābāhi al-a’lī … wa lam yatayassar fa-rāya raghbat al-Sulṭān akthar min ‘ilm al-nujūm ilā ‘ilm al-ṭibb li-
Raḥmān says, why he decided to compose a medical treatise on the basis of primarily the *Kitāb al-Qānūn fī al-Ṭibb* of Ibn Sīnā’ and the *Kitāb al-Mū’jam al-Qānūn* of Ibn al-Nafīs (d. 1288). Thereby he could remind the prince of his wide expertise in the natural philosophical sciences and show him that he deserved a higher status in the courtly hierarchy.

It is highly unlikely that ‘Abd al-Raḥmān found what he was hoping for when he presented his derivative medical treatise to Bāyezīd II by removing the autobiographical remarks and changing the contents of his dedication. Yet he still seems to have continued his astrological production at the princely court of Aḥmed, as we have available a surviving copy of a Persian *taqwīm* that he presented to the prince in March 1510. In the detailed register of gifts and payments covering the last decade of Bāyezīd II’s reign, ‘Abd al-Raḥmān is also specifically recorded as the munajjim of Şehzāde Aḥmed. According to the single reference to him in the register, he received 1,500 *akçes* on August 12, 1509 for an unspecified occasion.

Did ‘Abd al-Raḥmān ever attempt to become one of the court munajjims of Bāyezīd II? If not, why did he not strive for attaining a more lucrative and permanent office? If yes, what were

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129 TSMK A. 2010. The copy is marked with the idiosyncratic seal of Bāyezīd II and listed in ‘Āṭuff’s catalogue.

the reasons that hampered him from attaining his desire? Was there any set of criteria duly followed in the recruitment of munajjims for the imperial service? What could we say about the professional rivalries among practicing munajjims, or between munajjims and other experts at the court such as physicians or diviners? What are the reasons that helped certain munajjims attain promotion while caused others fall from grace? Based upon the nature of often-anonymous astrological sources and a few archival documents from the period, it is not easy to fully reconstruct the dynamics underlying the initiation of munajjims into courtly service and their subsequent relations with the patrons as well as rivals. By reading between the lines, however, is possible to provide partial answers.

Around the time Ḥābid al-Raḥmān was about to leave the lands of Rūm to further specialize in celestial pursuits in the Iranian lands, an émigré astral expert originally from the Gilan region in Iran arrived in Amasya and approached prince Bāyezīd, who was at the time the governor of the region. The full name of this expert is Ḥūṣām b. Shams al-Dīn al-Lāhijānī al-Ǧīlānī but often autographs his works with the name Khiṭābī munajjim al-Ḥusaynī. Khiṭābī has yet to become a subject of an in depth study and the references to his life in the available bi-bibliographical sources along with few other modern studies are rather discordant. Some of these studies assert, as his name suggests, that Khiṭābī was the son of Shams al-Dīn al-Lāhījī (d. 1311). In the copies of his works that I have examined, he always writes his name without using a shadda, though he often puts shadda for other words where it is necessary. Hence, his pseudonym should be Khiṭābī, not Ḥaṭṭābī as suggested by Osmanlı Astronomi Literatürü Tarihi/History of Astronomy Literature during the Ottoman Empire. There is yet further confusion among other studies such as that of Franz Babinger who thinks the author’s name is Khitāyī. This last proposition could not be true, as Khiṭābī explicitly says in the chronology section of his extant taqwīm for the year 895 that the calculation of the “munajjimān-ı Khitāy” as to the age of the universe is different from the calculation of the “munajjimān-ı mān” by which he refers to the munajjims from the Irān-zamīn.
1506?), the renowned disciple of Muḥammad Nūrbakhsh and the famous commentator of Shabistarī’s (d. 1340) Gulshan-i Rāz. The appeal to astronomical and astrological principles within the Nūrbakhshī circles, exemplified particularly in the Risālat al-Hudā of Muḥammad Nūrbakhsh, may lead us to think that Khitābī could really be the son of Shams al-Dīn al-Lāhījī al-Nūrbakhshī. Yet we do not have decisive evidence neither in Shams al-Dīn al-Lāhījī’s own writings including his collection of poems nor in the studies that briefly mention his life. The major bio-bibliographical source on the history of Ottoman astronomy lists a mid-fifteenth century copy of Ṭūsī’s commentary on Kitāb al-thamara, as written by Shams al-Dīn al-Lāhījī. Nonetheless this promising piece of evidence does not turn out to be true, as the colophon of the original manuscript clearly reads that the copy was drafted in the year 854/1450 by someone named Ismaʿīl b. Yūsuf Lāhījī. Curiously, the relevant bio-bibliographical source also gives the full name of Khitābī as Dallākzāde al-Khitābī al-Lāhijānī al-munajjim al-Gilānī by referring to Taşköprızade, who mentions a certain khaṭīb (preacher) named Mawlānā Ḥusām and known as Dallākzade. However, as Taşköprızade’s related entry describes the person in question as an expert in Quranic recitation without any reference to his astral pursuits, it is highly unlikely that Dallākzade in Taşköprızade’s biographical dictionary was the same person as

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136 SK Reisülküttab Ms. 572, 222a.
In a recent study on Khiṭābī’s treatise on a novel astronomical instrument that he composed in 887/1483 and presented to Sultan Bāyezīd II, the editors argue without any convincing proof that Khiṭābī is same person as Sayyid Munajjim, a relatively noted figure from the early Timurid context. Sayyid Munajjim of the Timurid realm, whose real name was Muḥammad al-Ḥusayn, is known as the author of astronomical and astrological works such as *Risāla-i shakl-i mughnī va zillī* and *Latāʾif al-kalām fi aḥkām al-ʿawām*. As far as the contents of these two works are concerned, Sayyid Munajjim was active in the Timurid realm as early as the turn of the fifteenth century. In the latter text that later gradually became a relatively popular astrological manual, Sayyid Munajjim explicitly mentions his own personal observation of a comet that appeared in the year 803/1400-1 in the direction of Rūm. He also clearly writes his real name in the autograph copy of *Risāla-i shakl-i mughnī va zillī* as “Muḥammad al-Ḥusayn, al-madʿuww bi-Sayyid Munajjim.” On the contrary, in the copies written by our Khiṭābī, all of which date to the last quarter of the fifteenth century, he writes his name either as Ḥusām b.

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139 The former work was presented in 25 Ramaḍān 837/30 April 1434 to Ulugh Beg. See: SK Yazma Bağışlar Ms. 1362. As for the *Latāʾif al-kalām*, I have examined a handful of copies in the manuscript libraries of Istanbul and major European cities, the earliest of which date back to the late sixteenth century. In the text itself Sayyid Munajjim refers to the year 824/1421 as the date he calculated the ascendant for the year. In all copies of *Latāʾif* his name is written as Muḥammad al-Ḥusayn al-madʿuww bi-Sayyid (al-) Munajjim.s
140 Kandilli Ms. 310, 30b. He retrospectively interprets the comet as the indication of Yildirim Bāyezīd I’s defeat at the hands of Timur in the Ankara Battle in 1402 and the following turmoil in the Rūm region for a decade: “ancha banda dīda ast dar sana ẓalāṣa va ṣamāna miʿa [803] hijriyya zuʿnāb zāhir shud bi-samt al-raʾs-i Rūm. Amīr Timūr dar lashkar badān jānīb bord va Yildirim Bāyezīd bagaraft va nāḥīz kard ... ve qarīb-i dah sāl dar ān mamlakat nahb u qatīl būd miyān-i ʿumarā va farzandān-i ʿū tāʾ āqībat bar yaki qarār garaft.”
Shams al-Dīn al-Khaṭṭīb al-mushtahir bi-Khiṭābī al-Lāhījānī or simply as Khiṭābī munajjim al-Ḥusaynī. Given that the Sayyid Munajjim of the Timurid realm was active in the 1400s and that he had a name clearly different from that of Khiṭābī munajjim al-Ḥusaynī who served Bāyezīd II as late as the mid-1490s, it also seems unlikely that the two are the same individual.

Who, then, was Khiṭābī? Unfortunately, he does not give us much information to go on when writing about his family, teachers, and peers. He only refers in his Risāla tashrīḥ al-ālāt to Rukn al-Dīn Āmulī as his master, who we know had composed, based upon his own celestial pursuits in Samarqand, the Zīc-i Jadīd-i Saʿīdī in addition to his other extant treatise on the uses of astrolabe (Kitāb panjāḥ bāb-i ʿustūrlāb) that he dedicated to Abūʿl-Qāsim Bābūr Mīrzā (r. 1449-1457).141 Although the zīj of Rukn al-Dīn Āmulī did not obtain popularity among the munajjims and taqwīm compilers in the Ottoman lands in the late fifteenth and the first half of the sixteenth century, Khiṭābī praises his master’s work as one of the three most preferred zījes of the period next to the Ilkhanid and Ulugh Beg tables. He even prefers to use it when he needed to calculate the planetary positions and determine the astrological houses.142

It is not certain when exactly Khiṭābī came to the Ottoman realm. The contents of his writings suggest that he first approached Bāyezīd II in the late 1470s while the latter was still the governor of Amasya. He then seems to have visited the capital and appealed to the reigning sultan Meḥmed II. One of his earliest works is a treatise on natural philosophy (ʿilm al-ḥikmat) entitled Jāmiʿ al-qismayn that he hastily composed in the year 884/1479 in Tokat and dedicated

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141 For the extant copies of his Panjāḥ bāb see the bibliography. For a brief discussion of the zīj of Rukn al-Dīn, see: Aydīn Sayılı, The Observatory in Islam, 212-216.
142 Bagheri and Somi, 183: “Va alān zījātī ki dar akhtar-i mamālik ʿamal karda mī shavad yaki Zīj-i Ilkhānī ast ... va digar Zīj-i ʿaṣrāt-i Mīrzā-yi Ulugh Begī ... va digar do Zīj-i Saʿīdī va Karīmī az ān ḥaṣrat-i ustādī Sayyid Rukn al-milla vaʿd-dīn Āmulī.”
to prince Bāyezīd with the hope of entering his service. As the title of the work suggests, Khīṭābī broadly reviews therein two philosophical disciplines: mathematical sciences (ḥikmat-i riyādī) and natural-physical sciences (ḥikmat-i ṭabi‘ī). As briefly mentioned in the first chapter Khīṭābī first elaborates on the science of the stars (‘ilm-i nujūm) and delves into an exclusively astrological discussion, laying out the qualities and indications of the twelve astrological houses. For him, ‘ilm-i nujūm, which is higher in status than medicine (‘ilm-i ṭibb), is a useful and divine knowledge that helps human beings understand the impact of the motions of the celestial objects upon the sublunary world, guard themselves against harm and destruction – as ordered in the Qur‘ān –, and learn about the divine decree with respect to their personal lives. He then proceeds to medicine and details diseases as well as the required medication for remedying each.

Khīṭābī was apparently in Istanbul by the end of the year 1479. On 11 December 1479, he completed his long commentary on Naṣīr al-Dīn Ṭūsī’s popular treatise, Risāla-i Sī faṣl, and dedicated it to the reigning sultan Meḥmed II. Although Khīṭābī says that his main objective in writing the commentary is to make the concepts and the terminology used in Ṭūsī’s text more comprehensible to beginners in this science, he later reveals that his real desire is to attract the

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143 SK Ayasofya Ms. 2414M, 19b-20a: “muḥarrir-i in suṭūr va muqarrir-i in mazbūr ... Ḥusām b. Shams al-Dīn al-khaṭīb al-muṣtaḥir bi-Khīṭābī al-Gīlānī ... ajāla al-vuqṭ ra dar ta’rīkh-i sana 884 hijriyya dar balda al-muvalḥīdīn Tokat ... bi-ḥəsb-i vasīla-i idrāk-i sa’ādat-i taqabbul-i turāb-i sidda-i raf‘ā-i pādishāh va pādishāhzādai ... sultan Abū l-muẓaffār Bāyezīd ... ta’līf kard.”

benevolence of the Ottoman sultan.\textsuperscript{145} In fact, Ṭūsī’s treatise was already one of the most popular texts of the genre among would-be munajjims of the time and Turkish translations of the work appeared as early as the late fourteenth century. In that regard, Khiṭābī’s claim to compose a text that would be helpful for novices does not represent the truth. That the work is currently preserved in a single copy and was listed in Ḍūfī’s inventory among the books at the palace library also proves that the text did not enjoy much circulation among the author’s contemporaries and subsequent generations. Thus there is little doubt that the aim of Khiṭābī’s long commentary on Ṭūsī’s Risāla-i sī faṣl was rather to secure the support of Meḥmed II by showing off his deep knowledge in celestial matters. He must have attained his desire as he immediately composed for Meḥmed II a voluminous birth horoscope, an imperial copy of which was produced in the year 1480 by the imperial calligrapher and bookbinder, Ghiyāth al-Dīn al-mujallid al-Iṣfahānī.\textsuperscript{146}

Khiṭābī seems to have secured his place in Bāyezīd II’s entourage after the latter’s immediate accession upon the death of Meḥmed II in 1481. In January 1483 he presented the new sultan, whom he described as being, among other things, wise and knowledgeable in sciences high and low (‘ārif al-ma‘ārif al-‘ulwiyya wa-l-sufliyya), a copy of his Risāla tashrīḥ al-ālāt, together with an instrument for celestial observation.\textsuperscript{147} As Khiṭābī states in his treatise, his remarks in the text hint that he also presents the sultan with an instrument for celestial observation: “har ayina alāt-i mav ‘ūd-rā bi yumn-i davlat-i qāhira-i ḥażrat-i pādishāhī bi-itmām rasānīda va kafiyāt-i a’māl va vaż ‘i ān rā darīn risāla mashrūḥ [va] mastür sākhta shod.” Khiṭābī’s reference here to al-ma‘ārif al-‘ulwiyya wa-l-sufliyya seems to be related to the classification of theoretical philosophy (al-ḥikma al-nazariyya) into sciences that deal with the

\textsuperscript{145} SK Ayasofya Ms. 2709, 3b: “[T]ā vasīla shavad bar dā ī-yi mukhliṣ rā bi-taqbīl-i turāb-i ‘ataba-i raf‘a va talthīm-i rajām-i sidda-i manī’a ... al-sulṭān b. al-sulṭān al-sulṭān Muḥammad b. al-sulṭān Murād Khan.”

\textsuperscript{146} TSMK Yeni Yazmalar 830, 264a. This text will be further discussed in Chapter 5.

\textsuperscript{147} His remarks in the text hint that he also presents the sultan with an instrument for celestial observation: “har ayina alāt-i mav ‘ūd-rā bi yumn-i davlat-i qāhira-i ḥażrat-i pādishāhī bi-itmām rasānīda va kafiyāt-i a’māl va vaż ‘i ān rā darīn risāla mashrūḥ [va] mastür sākhta shod.” Khiṭābī’s reference here to al-ma‘ārif al-‘ulwiyya wa-l-sufliyya seems to be related to the classification of theoretical philosophy (al-ḥikma al-nazariyya) into sciences that deal with the
the major objective of the work and the accompanying instrument is to test the accuracy of the three most preferred astronomical tables of the time. According to his calculations, he expects two conjunctions to happen in that year: the first conjunction between Mars and Jupiter, and the second between Saturn and Mars. Along with these two conjunctions, he also expects two full lunar eclipses to occur that year. However, as he says, the calculations based upon the tables of his master Rukn al-Dīn Āmulī and Ulugh Beg were significantly different than the Ilkhanid tables. Khitābī adds that as part of his research, he completed in Istanbul a solar observation and identified a solar eclipse that occurred in October 1482. While his solar observation in Istanbul by the early 1480s is important in its own right, his undertaking to ensure the accuracy of astronomical data is even more significant, since accurate astronomical data was exactly what practicing munajjims needed for rigorous calculations, and thus more precise astrological predictions.

Khitābī does not divulge in his Risāla tashrīḥ al-ālāt which of these three tables he favors as a practicing munajjim, but in drafting the taqwīm for the year 894/1489 he relies on his master’s work. Only one taqwīm survives that was indisputably penned by Khitābī, as it bears his autograph. A thorough discussion on the political and social significance of the taqwīm genre in the early modern Ottoman context will be found below in Chapter 4, but suffice it to say here that through detailed astrological predictions about the fortunes of the upcoming year and knowledge of celestial (ʿulwī) spheres (i.e., the quadrivium) and those that study the changes in the elemental sublunar (suflī) world.

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149 Ibid., 196: “chanāncha khusūfī ki vāqi’ shod dar shab-i yakshanbih-i chahārdahum māh-i Ramaḍān sana 887 raṣad kardim bi-ufq-i dār al-saltana-i Qoṣṭāntiniyya.”
pointed remarks on titulature, taqwīms were instrumental in shaping, representing, and even manipulating public opinion. Besides their obvious practical benefits for calendric and astrological purposes, taqwīms also served as tools for bolstering royal claims and promulgating these claims among the elite audience attached to the court. The astrological predictions in taqwīms are always biased in favor of the sultan, typically highlighting—in almost a propagandizing manner—the strength, perseverance, and well being of the reigning sultan, who is the single most important element in the functioning of law and order within the universe.

In his extant taqwīm from the year 894/1489, Khiṭābī as well eulogizes Bāyezīd II on the occasion of the coming of the new year and expresses his good wishes to the sultan, whom he hails as the “caliph of the All-merciful, shadow of divine affection, strengthener of the world and religion, succor of Islam and all Muslims, glory of kings and sultans, victorious over his enemies by help of the Beneficent King.” He then enumerates the important astrological variables -ṭālīʿ and other astrological houses —and begins laying out his lengthy predictions on the fortunes of the sultan. According to his predictions, the glory and the majesty of the sultan will remain untarnished, and his health and temperament balanced. The sultan will show sympathy to his subjects, bring civil order under his full control, but at times, especially during the winter, he will be anxious on account of his enemies and opponents. Khiṭābī then proceeds to elaborate on the

151 Ibid.: “dalālat konad ... bar tazāyud-i ʿazamati va jihānbaṇī va tażāʿuf-i ḥashmat va kāmrānī-ī ḥaẓrat-i ravā-i ḥaḍrat-i pādīshāhī-ī islām-panāhī khalladallāh mulkahu va sulṭānahu va ḥuṣul-i marām min ḥaythu al-majmūʿ fī tamām al-sana khuṣūṣā dar faṣl-i bahār ... dalīl bovad bar sīḥat va salāmat-i mīzāj-i sharīf va bar sarīr-i sulṭanat mutamakkīn bāda dar ṭadāhūr-i mulkī saʿy namūda va bā aʾādī va mukhālīfān ba-ṭarīq-i rafq va madārā sulik wāqiʿ shodan va andīsha-i umūr-i ʿaẓīma dar žāmūr-i munir āvordan va tavaqqūf dar naql va ḵarakat
fortunes of people from various sectors, including viziers, dervishes, scholars, and many others. His aḥkām for the year ends, as usual, with predictions about diseases, meteorological conditions, crops and prices, and wars and battles. He then draws two tables for the horoscopes of the upcoming year: one on the basis of the Chinese-Uighur animal calendar and the other on the basis of his calculations using his master Rukn al-Dīn Āmuli’s astronomical tables. Then comes the section on the monthly elaboration of the calendrical information and accompanying astrological judgments. It is worth noting that the predictions he expresses in the monthly sections of his taqwīm focus more on possible skirmishes and battles between Turks (Aṭrāq), Arabs (Aʿrāb) and Kurds (Akrād). It would not be farfetched to relate these remarks to the repercussions of the then-ongoing Ottoman-Mamluk confrontation. Taking all these elements into consideration, then, Khīṭābī closely follows in his taqwīm the standard scheme and conventions of the genre.

Based upon the extant manuscript evidence, Khīṭābī seems to be one of the most active munajjims during the first two decades of Bāyezīd II’s reign, yet there are several other names who composed taqwīms at the time such as ʿAbdulkerīm b. Mevlānā Sinān, Ḥamza b. ʿAbdulkerīm, and Nūreddīn b. Ḥamza, all of whom seem to be the members of a single family

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interested in astrological practice. Nevertheless, the lack of archival records and/or other (auto)biographical information from this early period makes it difficult to follow the stages of the careers of Khiṭābī and any other agent.

Surprising enough, in the comprehensive expense register that carefully records the names of individuals receiving gifts and allowances from the palace between the years 1502 and 1512, a certain Sayyid Munajjim is listed for at least thirty different occasions as the recipient of sultanic favor. In fact, as far as the detailed records of this register are concerned, Sayyid Munajjim seems to have enjoyed a status superior to all the other monthly-salaried court munajjims and unaffiliated experts presenting the court with almanacs. Unlike many others, he was not only rewarded whenever he presented a taqwīm; in certain years he received payments and/or robes of honor on four or five different occasions, most of which are unfortunately not specified. On several occasions (again unspecified) he was even paid 7,000 akçes, almost equal to the pay scale of high-ranking statesmen. The amounts he received when he presented a taqwīm were also always higher than other experts. While he was given 1,500 akçes, the amounts received by other munajjims ranged between 500 and 1,000. Moreover, he was once presented a garment on the occasion of the loss of his son, suggesting that he must have had a close relationship with the sultan, for it was usually Bāyezīd’s closest companions who received gifts upon such occasions of death or marriage.

Apart from the information gleaned from the gift register, we know next to nothing about Sayyid Munajjim, which makes this figure all the way more intriguing. Although he was

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153 These names also go unnoticed in contemporary historical narratives and/or biographical sources. There are five extant taqwīms composed by them: TSMK Bağdat Ms. 312, 313, 314, 315, 316.

154 Atatürk Kitaplığı Muallim Cevdet O. 71, passim.
apparently an important courtier of the sultan, as indicated by the amounts and occasions of the gifts he received, none of the biographical sources and/or contemporary narratives mention his name, with the exception of a waqf record, dated 894/1489, documenting his estates in the Eyüp neighborhood of Istanbul. The lack of contemporary information as to an important courtier of a sultan suggests that “sayyid (al-) munajjim” was rather the epithet, not the real name of the person in question. We should recall that the real name of the “Sayyid Munajjm” in the early fifteenth-century Timurid realm was Muḥammad al-Ḥusayn. In a similar vein, ‘Abd al-Raḥmān munajjim at the court of prince Aḥmed described his master Niʿmatullāh Shirāzī as the chief of the munajjims (sayyid al-munajjimīn). Therefore sayyid (al-)munajjim was likely a label attributed at different times to different munajjims either by themselves, their peers, or the court, whose prestige and erudition were deemed superior to their contemporaries. There are other epithets frequently deployed by astral experts in the fourteenth and fifteenth centuries such as shams al-munajjim used by Wābkanawī, or ʿimād al-munajjim used by Maḥmūd b. Yaḥyā b. al-Ḥasan al-Kāshī, the author of Iskandar’s famous horoscope.

Interestingly, one of the taqwīms composed in plain Turkish in the year 937/1531 and dedicated to Süleymān was signed by another self-proclaimed al-sayyid al-munajjim from Tokat, whose actual name was İbn Seyyid Tāc. If we recall the register of payments from the late 1520s that lists the son of Sayyid Munajjim as the then chief munajjim, we can safely argue that by the time this İbn Seyyid Tāc composed his almanac, the “sayyid munajjim” at the court of

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Bāyezīd II must have already passed away. All things considered, the chief (=sayyid) munajjim during the last decade of Bāyezīd II’s reign must have been an individual different than those at the Timurid realm or the time of Süleymān.

Could the Sayyid Munajjim at the court of Bāyezīd II be Khiṭābī himself? There is a slight possibility that the two were the same, for the waqf record about Sayyid Munajjim that dates back to 894/1489 establishes at least that the two were active at the same time. But we should also add that Khiṭābī never refers to the epithet in the surviving copies of his original texts, therefore we cannot easily assume the two as the same until a new document of evidence provides a fresh perspective.

Regardless of the real identity of this mysterious Sayyid Munajjim of the Bāyezīd’ court, the archival records about him document that as part of his service in the capacity of a court munajjim he contributed to the training of new munajjims. One of his students was his own son, Sayyid Ībrahīm, who was evidently active at the Ottoman court until the first half of Süleymān’s reign.157 There is unfortunately no surviving textual product that could be unequivocally attributed to him, but as the son of a prestigious expert as Sayyid Munajjim, he must have received the necessary astrological instruction from his father. Another student of Sayyid Munajjim, manifested through available archival registers, is a certain Receb, who debuted his career as the compiler of a taqwīm in the year 1512.158 As regards to the following steps of Receb’s career, there is also no information in contemporary sources, archival and manuscript alike.

158 Atatürk Kitaplığı Muallim Cevdet O. 71, 499: “Receb şâkird-i Seyyid Müneccim; 500; câme-i mirâhorî ‘an kemhâ-i Bursa.”
With respect to the training of new generations of *munajjims* thanks to the financial and material opportunities made available by the royal patronage and the office of the court *munajjims*, the story of the chain of transmission that ties Mīrim Çelebi from the time of Bāyezīd II to Riyāzī ‘Alī in the later stages of Sūleymān’s reign provides captivating details. As mentioned in greater detail above, Mīrim Çelebi was one of the key figures at the time that helped the production and dissemination of astrologically valid knowledge in the Ottoman capital. Although his status seems to be slightly different than being a mere court *munajjim*, as far as the available archival registers are concerned, Mīrim distinguished himself as a prominent expert of celestial knowledge through his textual products and documented service. He prolifically wrote treatises on astronomical instruments and astrological principles, which were significantly copied both at his own time and subsequent periods. In November 1516, for instance, a certain Lūṭfullāh b. Mübārek copied at least three treatises of Mīrim Çelebi on different types of quadrants.\textsuperscript{159} Lūṭfullāh’s name is not mentioned in contemporary archival and manuscript sources as a student and/or protégé of Mīrim Çelebi. There is one Lūṭfullāh, however, who became a court *munajjim* in the first decade of the reign of Sūleymān. The earliest record that contains a reference to him dates back to 1527 but as the wording in this record suggests (‘ādet-i Lūṭfullāh müneccim), he should have started his tenure before then.\textsuperscript{160} We also see his name in an imperial order sent in April 1578 to the judge of Istanbul. In this report, the judge is asked to procure for Taqī al-Dīn’s newly established observatory in Istanbul the relevant

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\textsuperscript{159} TSMK Hazine Ms. 1760.

\textsuperscript{160} Kamil Kepeci 1764, 25: “‘ādet-i Lūṭfullāh müneccim ki der rūz-i Nevrūz takvīm dāde – 1000 [akçe].”
books of the “late Lütfullâh.”

The significance of Lütfullâh for our purposes derives from the fact that he was the master of Riyâzî ‘Ali, who was, as listed in the relevant archival document, one of the two court munajjims in 1548 and 1549. The story of Riyâzî is important for a number of reasons. First of all, the case of Riyâzî presents us the most detailed information about the life of a practicing munajjim from the period. In addition to his being a court munajjim, Riyâzî was also a talented poet who found recognition among contemporary biographers. ‘Aşık Çelebi, for instance, introduces Riyâzî as a polymath, who was equally adept in a wide array of disciplines including the science of talismans and magic squares, geomancy, Ptolemaic astrology, Euclidian geometry, spherical astronomy, philosophy, celestial magic, logic, theology, and chronology. For him Riyâzî’s expertise in the science of the stars was so extensive that even the famous Egyptian astronomer Ibn al-Shâṭîr (d. ca 1375) was not half as good as Riyâzî (ānuñ bir şaţrı yokdur Ibn Şâţr); whereas the most important astrologer in the entire Islamic history, Abû Ma’shar was not even his one hundredth (Ebû Ma ’şer değûldür ‘ơşr-i ’aşir). He was so proficient in the science of the stars that he did not need to spend much time to calculate the motions of the celestial objects

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161 İsmet Miroğlu, “İstanbul rasathanesine ait belgeler,” *Tarih Enstitüsü Dergisi* 3 (1973), 75-82, at 80, document 2: “İstanbul kâdisına hüküm ki: Mûteveffâ Lütfullâh’iñ vakfi olan mûneccim kitâbları mahmiye-i mezbûredede Mi’mâr Sinân mahallesiniñ imami ve müezzinlerinde olduğî i’làm olunmañ alınıb raşadîhâneye verilmek emredilûb buryurdum ki vardukda te’hir itmeyûb mûteveffâ-yi mezbûruñ nûcûma ve ‘ilm-i hey’ete ve hendeseye müte’allah olan kitâbları eger mezkûruñ ellerindedür ve eger âhradadur her kimde ise zuhûra getürüb dalû bi’l-fi’il raşad hvismetinde olan Mevîlâna Taﬁyûddîn’e cümlesin teslim itdüresün.” Starting from Adnan Adıvar, the scholarship keeps assuming that this Lütfullâh in question is Mollâ Lütfî, who was executed in 1495 on the charge of heresy. As the order clearly reads, however, Lütfullâh in question should be the one who worked as a court munajjim at the time of Suleyman.

and understand their corresponding influence. Apart from ʿĀşık Çelebi, another late sixteenth century biographer Kınalızade Ḥasan (d. 1607) also praises Riyāżī as the Jamshid al-Kāshī of the time and Aristotle of the age.

As an Istanbul-born son of a *devshirme* (*İstanbullu ḳuloğlu*), Riyāżī received a standard *madrasa* education of his time before starting to closely study with Lütfullāh *munajjim*. The biographical dictionaries do not reveal where this master-apprenticeship relationship between the two took place or the books they studied together. However, as it is clear from the remarks of his contemporaries, Riyāżī received a solid training in different forms and genres of celestial knowledge.

In terms of the texts Riyāżī might have read during his training with Lütfullāh *munajjim*, his only surviving textual product, the horoscope he composed around the year 1550 for the construction of the Süleymaniye Complex, provides substantial details. Based upon his explicit references and citations in the text, Riyāżī must have well studied (Pseudo-) Ptolemy’s *Kitāb al-Thamara*, Ghaznawī’s *al-Kīfāya*, and the corpus of Kūshyār. He should have also spent much time on studying the *zīj* literature of the Maragha and Samarqand traditions as well as the uses of astronomical instruments. Mīrim Çelebi’s texts that were copied in the 1510s by Lütfullāh might have even been used during his training. In fact, there is manuscript evidence that clearly documents Riyāżī’s familiarity with Mīrim’s oeuvre. One of the two surviving manuscripts that I have been able to locate in which Riyāżī ʿAlî’s name is found as the possessor of the text is none

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other than Mīrim Çelebi’s commentary on the Ulugh Beg tables.\textsuperscript{165} The other item that apparently passed into Riyāżī’s hands is Nizām al-Dīn Nišābūrī’s commentary on the Ilkhanid tables.\textsuperscript{166}

Aside from illustrating the transmission of the post-thirteenth century Persian astral tradition into the Ottoman world from the late-fifteenth century onwards and its appropriation by subsequent generations of indigenous Ottoman experts, the case of Riyāżī also bespeaks the hardships and anxieties of a practicing munajjim whose career fortunes began to shrink by the mid-sixteenth century due to the decline in the extent of the courtly patronage of munajjims. The anecdotes shared by contemporary biographers along with Riyāżī’s own remarks in the Süleymaniye horoscope reveal an embittered munajjim afflicted by the incidents at his time. As ʿĀşık Çelebi narrates, Riyāżī apparently composed a talismanic treatise to introduce a novel technique that would help dispel the plague from Istanbul, one of the vexing problems of the time, yet his treatise did not receive any favor from contemporary elites. Reasons unclear, Kınalızade Hasan also mentions that throughout his career Riyāżī did not much enjoy the sultan’s grace. Hasan even quotes his father Kınalızade ʿAlī, who had once told him that Riyāżī would have been one of the most prominent and proficient experts of the rational and mathematical sciences, had he ever found the opportunity to become close to the sultan.\textsuperscript{167}

Later in his career Riyāżī considered returning to the judicial and scholarly hierarchy (ʿilmīyya), and asked for appointment as a mudarris or a qāḍī. Though ʿĀşık Çelebi does not

\textsuperscript{165} Now preserved as SK Mehmed Nuri Efendi Ms 151.
\textsuperscript{166} Now preserved as SK Fatih Ms. 3421. Robert Morrison also mentions this particular copy in his book on Nizām al-Dīn Nišābūrī.
\textsuperscript{167} Kınalızade Hasan, Tezkiretü’ş-Şuara, 351: “eger mukārin-i terbiyet ve mülākī-i takviyet-i sultān-i cihān olaydı ol fende a yān-ı zamāndan olacagina reyb u gümān olmaz idi.”
present any further detail about Riyāżī’s determination to return to the ‘ilmīyya hierarchy, Kınalızade Hasan says that during his attempt to reenter the ‘ulamā’ bureaucracy, he approached the shaykhulislam Ebu’s-su‘ūd Efendi (d. 1574) as his potential patron and frequented his majlis. Upon realizing, however, the non-tenured, erratic nature of a career in judgeship and professorship, he abandoned the ‘ilmīyya path and fully allocated his time to composing books. However, as ‘Āṣık Çelebi mentions, most of his writings remained in draft form. As a matter of fact, apart from the horoscope he prepared in 1550 on the occasion of the construction of the Süleymaniye complex, the available catalogues of major manuscript libraries in and out of Turkey do not yield any other surviving textual product of Riyāżī and there is not any modern scholarly work that ever mentions his name, let alone reconstructs his biography.

In the foundation horoscope for the Süleymaniye complex, which I will discuss in more detail next chapter, Riyāżī occasionally inserts his verses, the contents of which represent his resentment about his life and career. One of these verses reads:

“Riyāżī is distressed due to the evil fortune, Those ignorant ones attribute his misery to other reasons, While his fame was as bright as the sun, Those who are ignorant about the intricacies of (the science of) the stars receive more favours.”

Due mostly to this distress and disillusionment regarding his career, he even lately became unwilling to send taqwīms to the court. Through the end of his entry on Riyāżī, ‘Āṣık Çelebi quotes some of his verses, one of which Riyāżī wrote upon the death of his master Lütfullāh. Here Riyāżī again reveals his anxiety regarding his career and explicits his desire that
the deceased Lütfullāh’s allowances be annexed and added to his own, as there remained in the
court only two munajjims, one of which is no one but himself:

“Today I, the insignificant mote, were asked
By the sun of the sky of knowledge
Lütfullāh was the chief munajjim
He just passed away and left his pension
Who remained now at the imperial court?
As a (Jamshid al-) Kāshī-type observer of stars
I said: It is only (Yūsuf) b. ʿÖmer and I
Who survived this world as the ass and the head.”

Riyāżī was not entirely groundless in his resentment. As the available register of
payments is concerned that dates just a year before this horoscope was penned, Riyāżī was listed
as one of the two court munajjims receiving only six akçes a day, whereas his colleague Yūsuf b.
ʿÖmer, whom he mocks by saying “ass”, was making twelve akçes. In that regard Riyāżī’s pay
was extremely low compared not only to his sole coworker but also to other palace staff. For
example the daily allowance of the chief physician of the time, Seyyid ʿAlī ʿĀṣīnī, was eighty
akçes. Even the kehhal (ophthalmologist) Muḥyiddīn or the scribal apprentices in the imperial
treasury were making more than Riyāżī. 170

Besides the internal comparison on the basis of this single archival register from the
period 1548-9, a broader comparison of the pay scale of Riyāżī with those of previous court
munajjims in the late fifteenth and the early sixteenth century also illustrates that by the time
Riyāżī was hired as one of the two court munajjims, the office was no longer a lucrative or

169 ʿAṣīq Čelebi, Meşairü’-ş-Şuara, v. 3, 1398: “Şu’āl itdi bugün ben ʿzerresine/Maʿārif
āsumāınınuñ kuyāştı/Ki Lütfullāh idı evvel müneccim/Maʿādā ʿazm idūb ködi maʾāṣı/Ya şimdi kim
kalubdur bāb-ı şehde/Raşad-bend-i nūcüm-ı kaṣr-ı ʿĀṣī/Diṭūm Ḳīn ʿΩmer’le bendeñüzdiṭüm/Iki
kalduñ ciḥānda göti baṣṭı”

170 MAD 7118. The former was making eighteen akçes per diem, whereas the scribal apprentices
were earning around ten akçes on average.
prestigious profession, though their standard services for preparing taqwīms or calculating auspicious moments to initiate an imperial enterprise were still demanded. Therefore, the case of Riyāżī provides us a reasonable terminus ante quem to argue that by the mid-sixteenth century, the royal support for munajjims in the Ottoman court was on the verge of decline, only to be revived in the last quarter of the sixteenth century.

Before I move to the next chapter I should say that although the discussion throughout the chapter has barely discussed the munajjims presence in the marketplace or friendly gatherings (majlis), this should not give the impression that there were no other munajjim active at the time other than the courtly affiliated ones. Yet the evidence gleaned from literary or archival sources is so thin that it is almost impossible to write their history. In the biographical dictionaries of poets, for instance, there are meager references to a few practicing munajjims that do not necessarily discuss the whereabouts and clients of their service. Evliya Çelebi says that the total number of munajjims in Istanbul in the seventeenth century was seventy, but his words should be taken with grain of salt, for he often uses the exact same number in his descriptions of other professions. The available published ihtisâb registers that list a wide range of shops in the marketplace do not present any substantial evidence as regards to the business ventures of munajjims and any other type of diviners. Hence, the analysis here has to be rather restricted to

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172 The hisba manuals in the medival Islamic writing that show how the muhtasibs (market inspectors) administer the functioning of the market and upkeep of moral behaviors have
those experts visible only in the courtly setting.

references to munajjims. In, for instance, the hisba manual of the fourteenth-century Egyptian qādi Ibn al-Ukhuwwa (d. 1329), it is said that astrology should be practiced on main streets, not inside shops or in byways. Quoted in Yahya Michot, “Ibn Taymiyya on Astrology: Annotated Translation of Three Fatwas,” 150. I have explored all the ihtisāb registers compiled in Ahmet Akgündüz’s study, but could not come across a single reference. See Ahmet Akgündüz, Osmanlı Devleti’nde Belediye Teşkilatı ve Belediye Kanunları (İstanbul: Osmanlı Araştırmaları Vakfı, 2005).
Chapter Four—Chronicling the Past, Mirroring the Present, Divining the Future: Taqwīms (Almanac-Prognostications) in the Ottoman context

IV. 1. Introduction

Having surveyed the intellectual and cultural history of the science of the stars and the social history of its practitioners (munajjims) in the preceding chapters, we now turn to the Ottoman munajjims’ major textual production, the taqwīm, and situate the corpus of these works within its proper historical context. A detailed evaluation of the massive body of Ottoman taqwīms would require a separate dissertation unto itself, and such a study is outside the purview of this chapter. Rather, a few carefully chosen aspects of the extant fifteenth- and sixteenth-century Ottoman taqwīms will serve to elucidate the significance of this hitherto neglected primary-source material for late-medieval and early-modern Ottoman history. It is the aim of this chapter to redress some of the widespread assumptions about pre-modern taqwīms and to encourage future studies to be undertaken on further examples from diverse regions and periods, Ottoman and non-Ottoman alike.

The composition of taqwīms constitutes one of the longest enduring textual practices in all of Ottoman history. While the earliest surviving example of a taqwīm produced in the Ottoman realm dates to 1421, it is highly likely that they were produced on a regular basis for the Ottoman court prior to the fifteenth century, given the existence of older, non-Ottoman taqwīm texts and earlier references to the genre in medieval Islamic writing. Combining, among many other things, astronomical computations, calendric information, and astrological prognostications, the taqwīm survived in manuscript and print culture down to the early twentieth
century. We are, thus, speaking of a textual tradition that lasted at least five centuries, leaving behind a multitude of works.

Despite a plethora of Ottoman taqwīms in various libraries across the globe, the genre and its astrological constituents have not been adequately examined that. Earlier scholarship has mostly focused upon the non-astrological contents of these texts, such as the chronological lists or calendar tables. Notwithstanding the general scholarly lack of interest in especially the astrological components of the taqwīm genre, this chapter argues that a systematic investigation

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of their astrological and non-astrological constituents provides surprising insights into the political, cultural, and intellectual history of the early-modern Ottoman world. Inasmuch as taqwīms were produced and expired annually, a thorough examination of their contents from year to year helps chart a number of intriguing Ottoman realities, including common courtly perceptions of and attitudes toward rival polities, changing vocabulary of sovereignty, the shifting dynamics of the relationships between different social groups, or the scientific models followed in different periods by contemporary men of knowledge.

Notwithstanding the fact that the contents of taqwīms, especially the annual astrological prognostications expressed in vague and repetitive terms are often presumed in the available literature as historically useless materials, their relatively static character allows the modern historian to identify with relative ease those aspects of these texts that did vary across time. Gradual changes in style and contents in taqwīms allow us to historicize these texts and correlate them with contemporary developments in the Ottoman political and cultural sphere. It is, thus, of great importance to examine taqwīms not on an individual basis but rather as a corpus, scrutinizing their evolution over an extensive period of time. By doing so, it is also possible to escape from the trap of haphazardly attributing the references in a random taqwīm to contrived historical occurrences. Especially in utilizing the annual astrological predictions, which are more often than not expressed in vague terms, the modern researcher should resist the temptation to take them at face value and read them as an objective index of certain actual historical incidents.

In light of these methodological concerns, this chapter will first give a literary-historical background to the development and dissemination of taqwīmesque texts in medieval Islamic writing culture. While the taqwīm was employed from at least the ninth century onwards as a
form of writing in different literary traditions, ranging from astronomy and geography to medicine and history, the term increasingly came to denote annual astrological prognostications-cum-calendric information, prepared by experts in the science of the stars before or around the arrival of each solar year. This discussion will include a description of some of the defining features of the taqwīm genre. Although taqwīms written by various—and often anonymous—munajjims in different periods are not entirely identical in terms of their contents and style, the overall similarity of these texts allows us to define a prototypical example and describe its major characteristics to introduce the reader into their general structure.

This overview is followed by a close examination of the corpus of the fifteenth- and sixteenth-century Ottoman taqwīms, in which I relate different aspects of taqwīm writing to identifiable Ottoman realities at the time. By focusing upon the dynamics of production, circulation, and consumption of taqwīms, I attempt to accurately situate them within their proper historical contexts. As part of this overall inquiry, there follow three in-depth analyses. First, the reverse-chronology sections receive a detailed examination in which some of the misconceptions established by earlier scholarship regarding the nature of these chronology tables are addressed and redressed. Next, the astrological contents of taqwīms, particularly the detailed annual predictions, are explored in a comparative fashion, raising the question whether it is possible to use these predictions as a window into the political realities and ideological inclinations of their times. The final analysis treats the reception of taqwīms by the wider interpretive community and tries to gauge the extent to which annual astrological predictions figured in contemporary public discourse and shaped the imperial decision-making process.
IV. 2. *Taqwīm* as a special form of writing, *Taqwīm* as a specific genre in medieval and early modern Islamic literary tradition

In the three major languages of Islamic Near East, the term *taqwīm* connotes a calendar as we understand it today; in pre-modern times, its meaning was much more complex and varied. Before characterizing the generic features of the *taqwīm* genre and discussing its significance for modern historical studies, it should be first underlined, for the sake of clarity throughout the chapter, that the term *taqwīm* denotes three distinct yet interrelated types of compositions: i) surveys of knowledge displayed in tables, charts, and diagrams, popular in different genres of medieval and early modern Islamic writing, especially in the disciplines of the astral sciences, medicine, geography, and history; ii) the genre of almanac-prognostications comprised of annual astrological predictions and calendric information (which constitute the central theme of this chapter); and iii) calendars in the modern sense of the word.

The origins of the use of tabular forms in medieval Islamic literary culture are not entirely clear; yet it was largely astral lore, specifically the *zīj* (astronomical tables) literature, that initially stimulated authors from sister disciplines to integrate tables, columns, and charts in their texts. The word *taqwīm* in the *zīj* literature is originally used as often paired with any or all

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2 *Taqwīm* originally had a more spatial meaning, being derived from the Arabic root *qāma*, “to get up; to stand up; to stand erect; to rise.” *The Hans Wehr Dictionary of Modern Written Arabic*, ed. J.M. Cowan Third Edition (Ithaca: Spoken Language Services, 1976), 798. A modern dictionary of Arabic demonstrates its rich accretion of connotations, abstract, metaphoric, and practical, as: “raising, setting up, erection; appraisal, assessment, estimation, rating valuation; correction; rectification, amendment, reform, reformation, reorganization, reshaping, modification, adaptation; rectification, detection (el., radio); land survey, surveying; determination of geographical longitude and latitude; geography; stocktaking; almanac; calendar; chronology,” *Ibid.*, 801.

of the planets (i.e. \textit{taqwīm al-kawākib}) to denote the tabulated presentation of their true longitudes.\textsuperscript{4} Modeling likely upon its use in the astral lore, other genres in different disciplines began to employ the term. In the introduction to his geographical compendium \textit{Taqwīm al-buldān}, for instance, Abū’l-Fidā’ (d. 1331) explicitly says that he modeled his book upon earlier examples of \textit{zīj}.\textsuperscript{5} The obvious practical advantage of the tabular arrangement of information, for both the readers and authors themselves, drove its dissemination into diverse genres, considerably simplifying the task of finding the desired information in a text, like a specific treatment of a malady in a medical treatise, the mathematical denotation of a celestial position in an astronomical manual, the longitudes and latitudes of a city in a geographical work, or short biographical information on rulers in a historical text.\textsuperscript{6}

The scholarship on the use of tabular forms in Islamic manuscripts is unfortunately thin. Denise Aigle, one of the pioneering scholars working on medieval Islamic texts that employed graphic presentations, maintains that the preponderance of tabular organization in different literary genres, particularly in the works related to practical sciences such as medicine, geography, and history, proliferated from especially the thirteenth century onwards.\textsuperscript{7} These texts, regardless of content, usually have the word \textit{taqwīm} as part of their titles. Among the salient examples of this trend, one should name the \textit{Taqwīm al-abdān fī tadbīr al-insān} of Ibn Jazla (d.

\textsuperscript{4} Benno Van Dalen, “An Introduction to the Mathematics of Islamic Astronomy and Astrology.” (Unpublished paper).


\textsuperscript{6} Aigle, 16.

\textsuperscript{7} In addition to the above-cited work, see “The Historical \textit{taqwīm} in Muslim East,” in \textit{The Mongol Empire between Myth and Reality: Studies in Anthropological History} (Leiden: Brill, 2015), 89–104.
later than 1100), the *Taqwīm al-lisān* of Ibn al-Jawzī (d. 1201), the *Taqwīm al-adwiya* of Ḥubaysh b. Ibrāhīm al-Ṭīfīsī (d. 1231), the *Taqwīm al-buldān* of Abū`l-Fidā`, and even the *Taqwīm al-tawārikh* of Kāṭib Çelebi (d. 1657). Considering the surprising similarities in the tables and layout of the folios in these works and our almanac-prognostications, it is safe to argue that *taqwīm* as the genre of almanac-prognostications should be evaluated within this broader Islamic literary tradition of works employing tabular forms of presentation under the title *taqwīm*.

What *taqwīm* has come to denote as the specific genre of almanac-prognostications, however, is an annual presentation principally combining astronomical, astrological, and calendric information for the upcoming year. Seemingly ubiquitous throughout late-medieval and early-modern Islamicate culture, especially in the central and eastern parts of the Islamic world, these texts were primarily produced by experts in the science of the stars before or around the time of the year-transfer (*taḥvīl-i sāl*), that is, the spring equinox and beginning of the new solar year (*Navrūz*). The production of these texts required the astral expert’s making mathematical and astronomical computations of the true longitudes of the planets (*taqwīm al-kawākib*) necessary to deriving subsequent astrological analyses. As *taqwīms* were annually produced on the occasion of the turn of the new solar year, the defining moment for astronomical calculations is the time when the sun enters the sign Aries. After the *taqwīm*-compiler identifies

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10 Benno Van Dalen, “An Introduction to the Mathematics of Islamic Astronomy and Astrology” (Unpublished paper)
the ascendant (ṯāliʿ), establishes all the other astrological houses, and determines further celestial variables at the time of the spring equinox by drawing upon the data and methods provided by astronomical tables (zīj) in circulation, he or she prepares the horoscope of the coming year and starts delineating astrological predictions as to its fortunes.\(^\text{11}\)

While zīj was the most important, and evidently affordable tool in the taqwīm-producer’s paraphernalia, the vocabulary used in extant almanacs and other treatises hints that astral experts might have also used astronomical instruments for establishing the celestial map of the desired moment.\(^\text{12}\) Astronomical calculations, of course, provide the necessary ground upon which astrological predictions are laid down and calendric tabulations are placed. The general astrological predictions for the upcoming year (ahkām-i kulliya or ahkām-i tāliʿ-i sāl-i ʿālam) start with often-sycophantic remarks on the fortunes of the reigning sovereign to whom taqwīm is dedicated. The ruler, who is often paralleled to the Sun, is always at the center of the analysis, just as the Sun is the mainstay of the entire cosmos. This panegyric is followed by a discussion on the fortunes of other social categories, usually six in number, each theoretically corresponding to one of the seven planets. For example, the section following the fortunes of the ruler describes the conditions of viziers and other statesmen (ahvāl-i vuzarāʾ va arkān-i davlat), the third is on ʿulamāʾ, shaykhs, and related people (ahvāl-i ʿulamāʾ va fuqahā va mashāyīkh-i kibār), the fourth about governors and men of the sword (ahvāl-i umarā-i kibār va sipahsalārān-i ʿalī-miqdār), the fifth on the sultan’s women and servants (ahvāl-i khvātān va khuddām), the sixth on people of the divan including scribes, poets, physicians, and astrologers (ahvāl-i ahl-i dīvān

\(^{11}\) Ascendant is the point of the ecliptic rising on the eastern horizon at the given moment. See: Mohammad Bagheri, “Kūshyār ibn Labbān’s Glossary of Astronomy,” SCIAMVS 7 (2006), 155.

\(^{12}\) Some stock examples include “nazar bi-ʾAfītāb kardīm ki...” or “chūn nazār kardīm va yaftīm Bahrām rā dar vatăd-i ṭabī...”
va ṭibbāʾ va shuʿarāʾ va munajjīmān), and the seventh regarding travellers, messengers, and commoners (ahvāl-i misāfirān va rasūlān va ‘avām al-nās). Except for predictions about the sultan, the vocabulary used for these social categories is always impersonal and non-specific. The order and composition of these groups varies depending on the individual preference of the almanac maker. There are many instances in which groups are merged together and the taqwīm-maker composes this part in fewer than seven separate sections. In any of these cases, however, it is hard not to detect the sultano-centric political philosophy transmitted through the narration of astrological predictions.

Annual predictions about different social categories are followed by forecasts of earthly affairs. These affairs are usually grouped into four categories: wars and battles, meteorological events, crops and prices, and pestilence and disease. From time to time, almanac makers might also include, in addition to the predictions on social categories and earthly phenomena, a separate geographical section in which he or she explains how the fortunes of the upcoming year would look like for the major cities and countries in each of the Seven Climes of traditional geography.13

Following these general astrological predictions about the fortunes of the upcoming year, the almanac-producer usually places two charts on two separate pages. The first of these charts is a simple horoscope prepared according to the Chinese-Uighur animal cycle calendar.14 This chart is more often than not accompanied by a short bit of prose, explaining to which animal cycle the year in question belongs. There might also be a short prognostication of the fate of the year’s

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13 For the understanding of the climates, see: André Miquel, “İklim,” EI², Online version.
14 For Chinese-Uighur animal cycle calendar see: Osman Turan, On iki hayvanlı Türk takvimi (İstanbul: Cumhuriyet Matbaası, 1941).
newborns, distinguishing as a general rule between those babies born in the first half of the concerning year and those born in the second half. The second chart (on the following page) is the detailed horoscope computed by the almanac-maker utilizing the zij available. This chart is preceded by a short prose declaration of the expected time and date of the revolution of the solar year according to the lunar Islamic/Hijrī calendar. The date is then converted to other calendric systems used at the time. While the list of calendric systems may vary depending on the period and personal predilections of the taqvim author, the standard set of calendar systems includes three solar calendars: the Greek/Rūmī, the Persian/Zoroastrian/Yazdgīrdī, and the Jalālī/Malikshāhī, another solar-based calendar introduced at the time of the Saljuq sultan Malikshāh (r. 1072-1092).15

After these two charts and their short prose commentaries comes the laborious presentation of the astronomical, astrological, and calendric information for each month of the upcoming year. Here the almanac-maker places ephemeris tables to mathematically demonstrate the positions of the planets in each and every day of the month. Assuming the Sun moves constantly through the zodiac during the year, over one day the sun’s position increases by one degree; thus the position of the Sun in the zodiac is equivalent to the date in the schematic calendar. The tables also designate for each month the days of religious/liturgical and meteorological significance for different traditions. In addition to such astronomical and calendric information, the monthly tables also include brief astrological remarks in the form of predictions (ahkām) and advice on auspicious days and times (ikhtiyārāt), based on almanac-

15 For the classical study on the calendars used in the Islamicate world, see: Sayyed H. Taqizadeh, “Various Eras and Calendars used in the Countries of Islam,” BSOAS 9/4 (1938), 903-922; 10/1 (1939), 107-132; 14/3 (1952), 603-611.
producer’s interpretation of the individual horoscope of each month (i.e., the ṭālīʿ of the time of Sun’s entering a new sign during its annual rotation across the ecliptic). Finally the last folio of taqwīms is devoted to predicting eclipses in the upcoming year. If there is an eclipse expected to occur in the year, then information about its time, location, and duration is recorded. The reason why information about eclipses is recorded only at the end of taqwīms is, as al-Bīrūnī says, the unfavorable character of eclipses that were interpreted as bad omens.

It is highly telling to discuss the ways almanac-makers used the term taqwīm. Unlike the modern connotations of the word which incline more toward the notion of a calendar, medieval and early-modern Islamicate astral experts often employed the term in conjunction with either a specific planet, as in the case of taqwīm al-shams, or planets in general, as in the case of taqwīm al-kawākib, denoting “survey of [the true longitude of] the planets.” In this, taqwīm likely retains the original spatial connotations of its root, implicitly promising the calculation and tabulation of the true positions of the celestial objects across time, whereby one can easily determine the position of seven planets relative to each other. By contrast, the word tārīkh (“dating,” “history”) was favored in the astral lore to denote chronology/calendar systems. In the zij literature, and particularly in the two most popular post-thirteenth-century manuals of astronomical tables (i.e., the Zīj-i Ilkhānī and the Zīj-i Jadīd-i Ulugh Beg), the first chapters (dar maʿrifat-i tavārīkh) are often dedicated to describing then-widely-used chronology systems and methods of converting dates.

16 For ikhtiyārāt see: David Pingree, “Ekṭīrāt,” in Elr.
18 Wehr, Cowan, op cit., 12.
19 Surprisingly, the Zīj-i Ilkhānī has not been published in a critical edition. My references are
This summary of the structure of *taqwīms* relies almost exclusively upon the surviving Ottoman examples that constitute the greater majority of extant available Islamic *taqwīms* but it is possible to consider this schema as universally applicable to all available *taqwīms* notwithstanding the cosmetic differences among almanacs in terms of their contents and style. Although the great majority of extant *taqwīms* produced in different regions and periods of the pre-modern Islamicate world are found in Ottoman lands, there is rich documentary evidence for the production and use of this tool in earlier Islamic history and elsewhere. Though modern scholarly attention to the almanacs is quite limited, those few studies dealing with the genre of *taqwīm* demonstrate the likelihood that it originated in the eastern Islamic lands.  

The history of *taqwīms* in the Islamic world is yet to be written. Although the origins of the genre are obscure, Michael Hofelich argues that it developed from Hellenistic precursors dating from the fourth or fifth centuries A.D. In fact, from around 400 B.C. onwards after the Babylonians first invented the concept of the Zodiac, different arrangements of ephemerides for the sun, moon, and planets, and astrological remarks for the days of month emerged. In addition to the possible Babylonian-Hellenistic vein of influence, the impact of Indian and Sasanian astral knowledge on the formation of Islamic astrology, especially in the courts of the early Abbasid caliphs should also be taken into consideration.

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22 The most thorough discussion of the circulation of astrological knowledge in early Islam is offered by David Pingree, *From Astral Omens to Astrology: from Babylon to Bikâner* (Rome: Istitutio Italiano per l’Africa e l’Oriente, 1997). See also Pingree, “Astronomy and Astrology in
Thābit b. Qurra, the prolific polymath active at the Abbasid court in the second half of the ninth century, made the first known mention of a taqwīm, which he calls daftar al-sana (“account of the year”). Two centuries later, al-Bīrūnī also employed these concepts in his astrological compendium, Kitāb al-tafhīm li-awā’il ʿinā‘at al-tanjīm. According to al-Bīrūnī, these ephemeral texts, which he also named as taqwīm or daftar al-sana, were routinely produced each year around the time of Navrūz. The major objectives of these annual compositions, according to al-Bīrūnī, were to tabulate the planetary positions and the exact day/time in which the sun enters different signs of the Zodiac, to provide the calendric information for different chronology systems, and to communicate astrological prognostications. It also contained, as he described, a brief chronological section at the beginning, informing the readers of the dates of the prophets and distinguished rulers.

I will discuss in greater detail the significance of al-Bīrūnī’s remarks on the use of historical chronologies in almanacs when exploring the role of reverse-chronology tables in Ottoman taqwīms. Suffice it to say, the documented integration of historical material into taqwīms as early as the late tenth century seems to have been related to the growing popularity of astrological histories, or historical astrolgies, in the early Abbasid intellectual realm from the ninth century onwards.


25 In addition to Gutas’s work cited above, see Antoine Borrut, “Court Astrologers and Historical Writing in Early Abbasid Baghdad: An Appraisal,” in Contexts of Learning in Baghdad from the 8th-10th Centuries, ed. J. Scheiner and Damien Janos (Princeton: The Darwin Press, 2014), 455-
The early Abbasid period witnessed the pointed cultivation of astral lore and the intellectual and scientific legacies of Greeks, Indians and Sasanians’ becoming increasingly appropriated and “subsequently naturalized.” In addition to the aforementioned Thābit b. Qurra, the courts of the early Abbasid caliphs welcomed a great many astral experts, such as the Banu Nawbakht family, Māshāʾ Allāh b. Atharī (d. 815-6), Ṣafī al-Farrukhān al-Ṭabarī (d. 815-6), and most importantly Abū Maʿṣar al-Balkhī (d. 886). The scholarly efforts of these names helped accumulate different kinds of astrological texts ranging from individual horoscopes prepared for the members of the dynastic family to astrological histories aiming to explain and legitimize the divinely ordained rule of the Abbasid dynasty. It is no surprise that after initiating their new “cycle” (dawla), Abbasid caliphs cultivated astrology to bolster their ideological claims. In its simplest term, the genre of astrological histories provided chronological information about events in the distant and recent past, and associated these incidents with celestial phenomena, particularly the conjunctions occurred between Saturn and Jupiter.

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28 David Pingree, “Kirān,” EIr, Online version. See especially Charles Burnett and Keiji Yamamoto, Abū Maṣḥar on Historical Astrology. The Book of Religions and Dynasties (on
This conjunctionist astrology became popular in the early Abbasid intellectual context owing especially to the works and translations of Māshāʾ Allāh b. Atharī, who was crucial to channeling the Indian and Sasanian traditions into the Islamic intellectual realm.\textsuperscript{29} In it, the conjunctions of Saturn and Jupiter betoken the occurrence of major events such as the emergence of a new religious dispensation, a turn of a ruling “cycle” from one dynasty to another, or the replacement of a reigning ruler. There are different types of conjunctions and each type is associated with a different sublunary transition. For instance the regular conjunctions of Saturn and Jupiter that recur at intervals of about twenty years in a different sign (\textit{al-qirān asgar}, “the lesser conjunction”) indicate a change of ruler. These conjunctions stay in the same astrological triplicity [i.e., a group of three signs of the Zodiac belonging to the same element] for a long time; however, about every 240 years, they move into a new triplicity. This conjunction (\textit{al-qirān awsat}, “the middle conjunction”) was often interpreted as a marker of a more serious change such as the emergence of a new dynasty or a nation. Moreover, the completion of a cycle of shifts through all four triplicities every 960 years (\textit{al-qirān akbar}, “the greater conjunction”) was thought to indicate even a more sweeping change such as the advent of a prophet and the establishment of a new religious dispensation.\textsuperscript{30}

The earliest examples of this genre are unfortunately lost; but, on the basis of the surviving texts from the early ninth century examined by Edward Kennedy and his former colleagues, their production involved the detailed computation of birth horoscopes as well as the horoscopes of Great Conjunctions) (Leiden: Brill, 2000), 582-587.


\textsuperscript{30} For a concise summary of the theory, see Borrut, 468-9.
year-transfers of the birthdates (tahwīl sinnī al-ʿālam), which makes them the intellectual cousins, if not sisters, of the taqwīm texts. Antoine Borrut, who most recently pointed out the importance of the genre of historical astrology, argues—without mentioning the contemporary development of the taqwīm genre—that these texts gradually diminished and eventually disappeared in later Abbasid history after a new theocentric vision of history started to become the dominant view among the ‘ulamāʾ and as astrology was allegedly marginalized in Islamic society. We are not in a position to detect whether these Abbasid astrological histories, which Antoine Borrut argues gradually lost their significance, were incorporated, in whatever fashion, into later taqwīm texts. That the extant taqwīms from the Ottoman and non-Ottoman realms with chronology tables almost always exclude Umayyad history by jumping from the narration of Karbala to the emergence of Abū Muslim, suggests that earlier Abbasid astrological histories could indeed have influenced the structure and contents of later taqwīms.

Moving forward from the Abbasids, we find contemporary references to taqwīms produced in Fatimid Egypt and Syria in the eleventh century. Unfortunately the available catalogue records yield no surviving Fatimid taqwīms. The closest relative to a Fatimid taqwīm could be the twelfth-century ephemeral almanacs David Pingree and Bernard Goldstein found among the documents of the Cairo Geniza. These texts are Hebrew-alphabet transliterations of works originally composed in Arabic. Though most of these documents survive only fragmentarily,

32 Borrut, 485-7.
33 Aydı̇n Sayılı, The Observatory in Islam, 167.
some of their contents, combining astronomical descriptions of the daily position of the Moon with corresponding astrological analyses, do remind of the *taqwīm* tradition. The astrological components of these documents, however, do not include yearly and monthly predictions, and consist solely of astrological advice (*ikhtiyārāt*) one should keep in mind before deciding to do things like bloodletting, entering baths, or arranging marriages.

The Rasulid period in Yemen (1229–1454) provides the second richest collection of extant *taqwīms* after the Ottoman corpus. In his detailed analysis of the almanac genre during the Rasulid dynasty, Daniel Martin Varisco lists eight surviving Rasulid *taqwīms*, the earliest of which was compiled around the year 1271. Varisco’s study is of the utmost importance, for his is one of the rare scholarly attempts to recognize the set of almanac texts as an important historical source per se and contextualize their contents for the social, and particularly agricultural, life of medieval Yemen.

The preponderance of references in contemporary literary sources and other documents from Eastern Islamicate lands corroborates the modern scholarly assumption that the *taqwīm* was of Eastern Islamic/Persian origin. Niẓāmī-ʿAruḍī, for example, briefly mentions the *taqwīm* genre in his *Chahār maqāla*. In the introduction to his third discourse on the “lore of the stars and the excellence of the astronomer in that science,” he briefly summarizes the required qualities one has to have to become an erudite *munajjim*. Quoting al-Bīrūnī’s *Tafhīm*, Niẓāmī ʿAruḍī says “a man does not merit the title of *munajjim* until he has attained proficiency in four sciences: First, Geometry (*handasa*); secondly, Arithmetic (*ḥisāb*); thirdly, Cosmography

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(hay‘a), and fourthly, Judicial Astrology (ahkām).” For Niẓāmī, the most common applications of the science of the stars that incorporate all four of these sub-disciplines are astronomical tables (zījḥā) and almanacs (taqāwīm). Except for his reference to taqwīms as a practical field of interest for applying the knowledge of the science of the stars, there is no concrete example in Niẓāmī’s anecdotes of the actual use of taqwīms that might help clarify how these texts were produced and consumed at the time. However, we have additional hard evidence from post-thirteenth-century Persianate East, showing that taqwīm production was already an established tradition among practicing munajjims.

In his prologue to the Zīj-i Īlkhānī, for example, Naṣīr al-Dīn Țūsī (d. 1274) does not shy away from explicating to his audience the real purposes of the tables he and his colleagues prepared at the Maragha Observatory. Unlike modern scholarly treatments of the zīj literature that usually disregard the astrological intentions underlying the costly systematic programs of observations, Naṣīr al-Dīn Țūsī writes rather explicitly from the very beginning of the text, it is crucial to observe and calculate the positions of the celestial objects if one wants to have foreknowledge about earthly matters such as the security of the country, warfare and peace among rulers, health and disease of individuals, the situation of agricultural production and market prices, meteorology, and the fate of newborns. Astrological judgments about these

37 BML Or. 24, 2b: “Sukhan dar raṣad-i siqāraḡān va anki raṣad va zīj va taqīm cha bāshad: ... bi-dānistan-i raṣad-i mavżī-i siqāraḡān bar āsumān va payvastan-i īshān ba-yakdīgar va ījud shodan va miqdār-i davr-yi īshān az yakdīgar va az zamīn va miqdār-i ravish-i īshān ma’lūm shavad va az dānistan-i ān hukm tuvān kard ki ba’d az in dar ʿālam cha khāhad būd az āminī va parīshānī va sulh-i pādishāhān bā-yakdīgar va īharb va gardish-i rūzgār va tandorost-ī bīmārī-ī khalq va vabā va farāhī va tangī-i narkhhā va bārandagī va khushgī va digar ṭalhā va hamchunī hāl-ī har farzandī ki dar vujūd āyad va dirāzī-ī ʿomr va kūtāhī va nik-bakhīt va bad-
issues could only be cast with a precise knowledge of celestial positions, and the knowledge of celestial positions could only be calculated accurately by systematic observation. Once the positions of celestial objects in each and every day are established through laborious observation, this information is recorded in a manual of astronomical tables, i.e., a zij (Ar. pl. azyaj). Utilizing the data and methods provided in these tables, taqwīms are produced on a yearly basis, designating the positions of celestial bodies across the year, which would allow practicing munajjims to calculate the ascendant and make their astrological predictions. Ṭūsī concludes his introduction by saying that he hopes his new zij will become the main reference work for munajjims in preparing their almanacs and casting horoscopes.38

Aside from Zij-i Ilkhānī, the real contribution of Naṣīr al-Dīn al- Ṭūsī in the field of almanac-making was his short treatise, Mukhtasar dar maʿrifat-i taqvīm, better known as Risāla-i Sī faṣl. This work explains concisely the nature of the planets, the characteristics of the signs of the Zodiac, and the influences of different planetary positions, and soon became one of the most sought-after astrological texts in the Central and Eastern Islamic lands. As we have already mentioned, along with the commentaries of later astral experts such as Khīṭābī (d. later than 1495) or Birjandī (d. 1525), the work was translated into Turkish as early as the fifteenth century

38 BML Or. 24, 3b.
by Ahmed-i Dā‘ī.\textsuperscript{39}

For practicing \textit{munajjims}, especially the novice and inept ones, almanacs had a function similar to the \textit{zīj}, providing readily available tables of celestial positions in a given year. However, the prestige of a \textit{munajjim} rested upon the ability to make the necessary astronomical calculations with ease and precision on his/her own. Because making accurate calculations without relying upon a \textit{zīj} was a praiseworthy virtue for a \textit{munajjim}, unskilled practitioners were often mocked for their lack of computational skills. For instance in one of his letters to his father, Jamshīd al-Kāshī (d. 1429) derides a certain Mawlānā ʿImād for his inability to determine the positions of celestial objects without—not even a \textit{zīj} but—an almanac.\textsuperscript{40} It is evident through the remarks of al-Kāshī that an erudite \textit{munajjim} was expected to produce \textit{taqwīms}, not simply consume them.

Jamshīd al-Kāshi is not the only witness to the production and circulation of almanacs in the Timurid era. Although no almanac from the Timurid realm is known to survive, various contemporary scholars refer to the genre in their writings. It would have been surprising indeed not to find such references to the notion of \textit{taqwīm} in the Timurid context, as it was in the courts of Timurid princes, especially the first half of the fifteenth century, that astral pursuits, among other occult curiosities, gained a new momentum. Mīrzā Iskandar ibn ʿUmar-Shaykh (r. 1409–14) was evidently the first of these princes who showed a keen interest in the science of the stars


Two of the contemporary voices that help us document the use of \textit{taqwīms} in the Timurid world were intimately connected with Ulugh Beg. The first one is Sharaf al-Dīn `Alī Yazdī (d. 1454), a dynastic historian to the Timurids and an influential occult philosopher, who was personally invited by Ulugh Beg to join the team of astral experts at the Samarqand observatory.\footnote{For his life and intellectual stance, see: Evrim Binbaş, “Sharaf al-Dīn `Alī Yazdī (ca. 770s-858/ca. 1370s-1454): Prophecy, Politics, and Historiography in Late Medieval Islamic History.” (Ph.D. dissertation, University of Chicago, 2009).} In one of his short treatises, Yazdī treats the \textit{taqwīm} texts and attempts to outline their major characteristics. As his wording suggests he associated the \textit{taqwīm} with cognate occult activities that aim to rationalize the divine secrets underlying the interconnectedness of celestial
and terrestrial realms.\textsuperscript{44} For Yazdī, annual \textit{taqwīms} systematically determine the daily celestial positions and derive accompanying astrological suggestions therefrom. Although he does not comment upon the origins or historical development of the genre, his remarks on the inclusion of annual astrological predictions relative to the fortunes of seven different social categories and five earthly affairs evince the established practice of the almanac tradition in the central and eastern Islamic lands.\textsuperscript{45}

The second scholar from the Timurid realm who testifies to the use of almanacs is Muḥammad al-Ḥusayn (d. later than 1434), better known as Sayyid Munajjim.\textsuperscript{46} As mentioned in the previous chapter, Sayyid Munajjim presented Ulugh Beg with an astronomical treatise that he finished composing on Friday, Ramaḍān 20, 837/April 30, 1434.\textsuperscript{47} He is most famous for his \textit{Laṭāʿif al-kalām fi āhkām al-aʾwām}, a manual for teaching the students of the science of the stars’ basic astrological principles. Like Ṭūsī’s \textit{Maʾrifat-i taqwīm}, Sayyid Munajjim’s astrological textbook soon became popular among contemporary students. Besides his autobiographical remarks and astrological interpretations of the comet that became visible in the


\textsuperscript{47} SK Yazma Bağışlar Ms. 1362.
year 803/1400–1 as the portent of Timūr’s victory against Bāyezīd I (r. 1389–1402), the most interesting aspect of this text for our purposes here is the quasi-\(\text{taqwīm}\) of the year 824/1421 appended to the end of the treatise.\(^{48}\) In fewer than 12 folios, Sayyid Munajjim calculates the horoscope of the year and enumerates the accompanying astrological forecasts (\(\text{āhkām-i kulliya-i ʿṭāliʿ-i sāl-i ʿālam ʿalā tarīq al-ījmāl}\)).\(^{49}\)

One last contemporary source on \textit{taqwīms} in the Timurid realm is Rukn b. Sharaf al-Dīn al-Āmulī, another venerable astral expert who wandered around Iran and India during the tumultuous years of the post-Shāhrūkh (d. 1447) period.\(^{50}\) As the author of an individual \(zīj\) and master of several students, some of whom eventually ended up in the Ottoman court and served the Ottoman sultans, Rukn al-Āmulī’s views on the science of the stars reveal the common scholarly approach toward the practice of the science of the stars in the late-medieval Turko-Persian cultural sphere. In the treatise on the astrolabe that he dedicated to Abū’l-Qāsim Bābūr Mīrzā (r. 1449-1457), Rukn al-Āmulī says that he spent most of his career studying philosophy (\(\text{ʿulūm-i ḥikmā}\)), more specifically the mathematical sciences of \(\text{ʿilm-i hay’a}\), geometry (\(\text{handasa}\)), and arithmetic (\(\text{hisāb}\)).\(^{51}\) There is no doubt for him that the ultimate goal in studying these disciplines is to practice the science of judgments (i.e., astrology) and grasp the methods of time reckoning (\(\text{samara-i īn ʿulūm... ʿilm-i āhkām va maʿrifat-i avqāt ast}\)). The proper conduct of these practices, however, is foundational: first observing the stars, and then calculating the true longitudes of stars (\(\text{istikhrāj-i taqwīm-i kavākib}\)) and the horoscope of the hour horoscope

\(^{48}\) Kandilli Rasathanesi Kütüphanesi Ms. 310, 30b.
\(^{49}\) Ibid., 63b-71b.
\(^{50}\) Not much is known about Rukn al-Āmulī. In addition to Sayılı’s \textit{Observatory in Islam} (p. 214-5), see: S. Mohammad Mozaffari and Georg Zotti, “The Observational Instrument at the Maragha Observatory after AD 1300,” \textit{Suhayl} 12 (2013), esp. 146.
\(^{51}\) Harvard University Library Ms. Persian 33, 2a-3a.
(ṭavālīʿ-i sāʿāt). The astrolabe is, according to Rukn al-Āmulī, the best tool in the eyes of the men of wisdom to compute the horoscope as well as make other necessary time measurements.⁵² Rukn al-Āmulī’s text does not specifically discuss the genre of almanac-prognostications; however, given that he mentions the importance of tabulating the celestial positions for a certain time, his elaboration is perfectly applicable to (and may even derive from) the tradition of preparing taqwīm-i sāl based upon the celestial configuration at the time of the year-transfer.

As part of our survey of pre-Ottoman taqwīms, we may now finally introduce two surviving almanacs from fourteenth-century Rum and Anatolia. One of these texts is a Greek almanac produced in Trebizond by an anonymous author for the course of the year March 12, 1336 to March 12, 1337.⁵³ The basic structure of this text is quite similar to other surviving examples of taqwīms from later periods of Islamicate history and bears many prototypical characteristics of the genre outlined by earlier authorities such as al-Bīrūnī. As is customary, this Greek text starts with determining the celestial map at the time of the spring equinox. After calculating the ascendant and rendering the horoscope, the author shares his astrological predictions as to the fortunes of, first, Constantine Loukites, the eminent official in Trebizond, and then those of various other social groups. Similar to many later taqwīms, these annual predictions are followed by monthly tables of astronomical and calendric information, the margins of which are filled with astrological prescriptions for performing and/or avoiding certain acts. The dates in the tables are given according to the Byzantine and Hijrī calendars. Considering the vibrant intellectual relations between Pontus Trebizond and western Iran in the

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⁵² Ibid., 3a.
⁵³ Raymond Mercier, An Almanac for Trebizond for the Year 1336 (Louvain-la-Neuve: Academia-Erasme, 1994).
fourteenth century, it is not far-fetched to argue that the methods and data used by the anonymous Byzantine almanac-maker were modeled upon the contemporary Persian astral tradition.\textsuperscript{54} Several contemporary scholars in the Trebizond region were instrumental in the transmission of Persian astral materials to the Greek world. For example, Gregory Chioniades (d. 1320), a protégé of Constantine Loukites and a key figure in the introduction of new forms of astral studies into the Byzantine world, conveyed the then-recent astronomical tables of \textit{al-Zīj al-Sanjarī} by al-Khāzinī, \textit{al-Zīj al-Alāʾī} by al-Shirvānī, and the \textit{Zīj-i Ilkhānī} into the Greek world. This argument is borne out in fact in this case, as Raymond Mercier asserts on the basis of his own calculations that this almanac was computed by utilizing either the \textit{Zīj-i Ilkhānī} or \textit{al-Zīj al-Alāʾī}.\textsuperscript{55}

The second extant fourteenth-century \textit{taqwīm} from the \textit{Rūm}-Anatolia region is the illuminated and voluminous almanac prepared in the year 773 A.H. (July 15, 1371–July 2, 1372 A.D.) for the Eretna court by a certain Zayn al-Munajjim b. Süleymān al-Konavī.\textsuperscript{56} In fact, it is difficult to define it as a standard \textit{taqwīm}, as the text lacks astronomical contents, detailed annual astrological predictions, or ephemerides and calendar tables. It is, rather, a compendium of useful divinatory knowledge, including tables and charts for different occult practices that range from dream interpretation and palmoscopy to astral divination and \textit{ikhtiyārāt}. A detailed historical chronology, listing major events that have happened from Creation up to the year 769, precedes all of these tables of divination. Apparently, the paratextual notes scattered in the first few folios document that the \textit{taqwīm} was in circulation in the Eretna court for about a decade since its

\begin{itemize}
  \item \textsuperscript{54} See for instance: David Pingree, \textit{The Astronomical Works of Gregory Chioniades} (Amsterdam: J.C. Gieben, 1985).
  \item \textsuperscript{55} Mercier, 17.
  \item \textsuperscript{56} SK Nuruosmanıye Ms. 2782.
\end{itemize}
composition, for there are records about events that happened in the year 783.\textsuperscript{57} Although the text lacks year-specific astronomical and astrological calculations, the layout of the folios, the detailed charts for divinatory practices, and most importantly, the presentation of reverse historical chronology tables make this compendium a close relative of the fifteenth-century Ottoman taqwīms.

\textbf{IV. 3. Taqwīm à l’Ottoman}

As the development of the genre described above clearly demonstrates, the Ottoman case is not the first instance in the Islamicate world where taqwīms were composed routinely. Ample references to the practice from at least the tenth century onwards and a few surviving manuscripts from outside the Ottoman world make it possible to argue that the taqwīm was a ubiquitous literary tradition in Islamicate culture during the Middle Ages. Yet, unlike other periods and cultures of the Islamicate world for which a dearth of evidence prevents definitive interpretation of the significance of this genre, the early-modern Ottoman era provides a substantial amount of taqwīm texts that can be carefully followed, almost year-to-year.

The best bibliographical sources for Ottoman taqwīms, \textit{Osmanlı Astroloji Literatürü Tarihi}, and the two volumes of \textit{Kandilli Rasathanesi El Yazmaları Kataloğu}, list by my count over 150 known almanac-prognostications composed in the period 1421-1800.\textsuperscript{58} This list is far

\textsuperscript{57} One of these notes is related to the late-fourteenth century Ottoman principality, showing that the Ottoman conquests in western Anatolia were followed in the Eretna court: “\textit{fath kardan-i khudāvandīgār ... Sultān Bāyezīd b. Murād Beg b. Orhān dar vilāyat-i Aydīn va Şārūhān sana 771.”

\textsuperscript{58} Günay Kut, \textit{Kandilli Rasathanesi el yazmaları : Boğaziçi Üniversitesi Kandilli Rasathanesi ve Deprem Araştırma Enstitüsü astronomi, astroloji, matematik yazmaları kataloğu} (İstanbul: Boğaziçi Üniversitesi Yayinevi, 2007); Ibid., \textit{Kandilli Rasathanesi el yazmaları : Boğaziçi
from complete, as many *taqwīms* have certainly been lost altogether due to their ephemeral nature, and some additional ones doubtless survive undiscovered within miscellanies and obscure collections. I have had access to about 120 such works and have closely studied more than two third of these.

Although earlier scholarship on the Ottoman *taqwīms* has argued that they were produced in multiple copies to be distributed to the wider reading public, there is not much evidence in support of this case in the surviving manuscripts and contemporary historical sources, at least prior to the nineteenth century.\(^{59}\) Compared to contemporary Europe where vernacular almanac-prognostications became early-modern best sellers after the introduction of print technology, the consumption and circulation of the fifteenth- and sixteenth-century Ottoman *taqwīms* were mostly restricted to the inner circle of the sultan. The European counterparts of *taqwīm*, that is, the *tacuini* in Italy, the *practica* in Germany, and the *almanach* in Britain, France, and the Low Countries had formats, contents, and functions surprisingly similar to those of contemporary Ottoman *taqwīms*.\(^{60}\) In fact, as revealed in etymological dictionaries of Latin, the word *tacuini* was originally derived from the Arabic *taqwīm*, making these contemporary texts close relatives.\(^{61}\) Despite from this intriguing etymological connection, there is alas no study shedding...
light upon the shared sources and origins of these different varieties of almanac-prognostications. Yet, the relatively rich European historiography on early modern almanac-prognostications makes it evident that these texts enjoyed wider public and political recognition in Europe from the late fifteenth to the early eighteenth century.

It is outside the purview of this study to compare early-modern Ottoman taqwâms to their contemporary European counterparts. What I will try to do here is to go beyond the earlier descriptive treatment of the genre and correlate different aspects of taqwîm writing to the (changing) realities of the early-modern Ottoman world. By especially focusing on the production, circulation, and consumption of taqwîms, and tracing relevant stories of the agents involved, I will historicize fifteenth- and sixteenth-century Ottoman taqwîms within their respective social and political contexts.

Regarding the authorship of taqwîms, earlier scholarship has suggested that the task of compiling and presenting the annual taqwîm was a monopoly enjoyed by the office of müneccimbaşı. As we have already discussed in the previous two chapters, despite the fact that an office consisting of monthly-salaried court munajjîms became formalized during the time of Bâyezîd II (r. 1481-1512) and the tasks of the munajjîms on the palace payroll were more or less defined, taqwîm production was still considered a viable option for aspirant outsiders seeking to secure a sultanic benefaction.

It is not easy to reconstruct the personal dynamics underlying the production of taqwîms. Most of the surviving fifteenth- and sixteenth-century taqwîms do not include the names of their compilers. Those few almanac-prognostications identifying their authors are also not very

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helpful. Almanac-makers revealed little about themselves in their taqwīms, and were barely considered worthy of mention in contemporary biographical sources. For example in Ṭaṣkoprızâde’s al-Shaqāʾiq al-Nuʾmāniyya only one individual, that is Mawlānā Aṭāullah ‘Acemî, the master of Mīrim Çelebi, is underlined for his productivity in the making of taqwīms. Likewise, in contemporary historical narratives and chronicles, there exist no specific mention of a taqwīm maker or a munajjim, despite loose references to the services of unspecified munajjims in designating auspicious times for undertaking imperial enterprises. The archival documents, already introduced in the previous chapters, are also not that helpful for illuminating how the munajjims were undertaking the task of producing and presenting annual taqwīms.

Therefore we do not have sufficient evidence as to the exact mechanics and procedures underlying the taqwīm business. Who were the agents involved in the writing of a taqwīm and its presentation to the palace? Were all taqwīms welcomed in the palace or was there any initial selection process? Did the sultan really read them (or have them read to him)? Who had permission to read annual taqwīms? Were taqwīms of each year read once and for all, or did their readers consult them sporadically throughout that specific year? Where were the taqwīms kept? Why were they—or at least some of them—kept after they expired?

There is no trace in contemporary narrative and archival sources as to a sort of atelier in the palace in which presentation copies of taqwīms were produced. It was mostly incumbent

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64 There is a substantial literature on the preparation of illustrated manuscripts for the Ottoman court, yet in none of these studies is mentioned the production of a taqwīm. See for instance: Emine Fetvacı, Picturing history at the Ottoman Court. (Indiana: Indiana University Press, 2013); Fatma Sinem Eryılmaz, “The shehnamecis of Sultan Süleyman: Arif and Eflatun and their dynastic Project.” (Ph.D. Dissertation, The University of Chicago, 2010). See also: Filiz
upon the individual almanac maker to prepare his taqwīm on the basis of established conventions. In fact, in terms of its production and reception by readers, the astrological almanac should be considered slightly different than a regular book. Early modern Ottoman readers of taqwīms were aware of the ephemeral nature of these texts. For instance in a relatively popular late-fifteenth century text of folk astronomy and meteorology, the author Ḥâce Ebrî points to the main difference between a taqwīm and his malḥama text by reminding his readers that taqwīms are rendered ineffective every new year whereas malḥama texts survive for years to come.65 Kātib Çelebi also implies this in his Taqwīm al-tawārīkh by saying that taqwīms of munajjims are by nature ephemeral.66 Due mostly to their ephemeral nature, their preservation was not an immediate concern. For example, from the early years of Bāyezīd II’s reign, there are at least three separate taqwīms (from the years 894/1489 and 895/1490) that have the seal of the sultan in their flyleaves, showing that these copies were initially incorporated to the imperial library. However, the detailed catalogue of the Ottoman Palace Library prepared in 1502–3 by the chief librarian Ḥāṭufī, does not cite any of those three sealed taqwīms among regular books in the library, hinting that taqwīms were considered at the time different than regular books despite the fact that the they are all in codex form.67

As regards to the time of the production and presentation of these texts, it is not far-fetched to consider taqwīms in parallel with New Year’s greetings, for taqwīms were prepared and presented on the occasion of Navrūz. Given the dearth of substantial studies about the

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65 SK Hafid Efendi Ms. 205/1, 2b: “takvīm gibi yılda bir zāyiʿ olmaz.”
66 Katib Çelebi, Takvimü ’i-Tevarih, 4b: “takvīm-i aştāh-i tencīm gibi mensūhī ʿl-ʿamel.”
67 Library of the Hungarian Academy of Sciences, Ms. Török F 59.
historical anthropology of Navrūz celebrations in different parts of the Islamic past, it is difficult to argue with certainty that the coming of the new solar year was always flamboyantly celebrated in different corners of the Islamic world, but on the basis of several pieces of literary evidence from the Turko-Persian cultural zone, it is still safe to maintain that the coming of the spring (as well as the new solar year) was usually considered an auspicious instance: a proper time for the planning and execution of military campaigns, a propitious moment for poets to present the court with their most recent literary compositions, a welcome opportunity for physicians to offer their novel medical prescriptions, and of course a timely occasion for munajjims to deliver their annual taqwīms. In the early-modern Ottoman courtly context, these literary offerings had a certain symbolic and material value within the matrix of complex patrimonial gift culture, and Navrūz presented a perfect opportunity for aspiring individuals to establish contacts with imperial elites.

To exemplify the timing of the presentation of taqwīms to the palace, the famous register of payments from the last decade of Bāyezīd II’s reign documents that the entry on the taqwīm submission of Qāḍī-i Baghdād was recorded in early April of 1508. Six more individuals

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69 Atatürk Kitaplığı Muallim Cevdet O. 71 is replete with entries on individuals who received gifts on occasion of the coming of the spring (=Bahāriye).

70 Ibid., 127.
received cash and robes in exchange for taqwīms they presented to the court that year. Accordingly, Mawlānā Sayyid Munajjim and his son Sayyid Īsmāʿīl received 1,500 and 1,000 akṣes respectively on March 19, 1508. Two days later, on March 21, 1508, Salmān-i ʿAjam and Erdeṣīr, both among the müşāherehōrān class, received 500 akṣes each for their taqwīms. Finally on April 2, Yūsuf b. ʿŌmer el-Sāʿatī, who was recorded as Sinān b. Munajjim, and a certain ʿAlī, who is specifically identified in the relevant entry as the student of Mīrim Čelebi, received 500 akṣes.71 In view of this list, it is self-evident that Bāyezīd II must have accorded great esteem to Qāḏī-i Baghdād, as the amount of the cash gift the newly arrived scholar received equals the largest bequest to any of the presumably more established astral experts.

One thing that is not clear from the archival records is whether each of these experts mentioned presented an individual taqwīm or not. Did Mawlānā Munajjim and his son receive benefits for presenting two individual taqwīms or a single one that they produced collectively? Likewise, does the stock phrase in some of the later sixteenth century documents, “the custom of the munajjims who presented a taqwīm” (ʿādat-i munajjīmēn ki taqvīm avordand), meaning the routine almanac presentations of the munajjims, refer to a single taqwīm produced through the collective effort of the court munajjims or a number of different taqwīms compiled individually by each of them?

Considering the fact that we have copies of taqwīms compiled by different individuals for a single year, it is highly likely that, at least for a certain period of time during which courtly interest in astral computations and astrological predictions was on the rise, the court was

71 Ibid., 126-127.
annually presented with a number of different almanacs. Not all of these diverse almanacs have reached our time, but for certain years three or more taqwīms have survived. For instance for the year 932/1526, we have four different almanacs apparently compiled by different taqwīm makers. While two of these taqwīms are anonymous, the remaining ones were compiled by Necmeddīn b. Seyyid Muḥammed and Yūsuf b. ‘Ōmer el-Sā‘atī respectively. Similarly, three distinct almanacs survive from the year 909/1504. Two of these taqwīms are anonymous, whereas the compiler of the third one was Salmān from Iranian lands, whose name is recorded in the massive register at least nine times as one of the monthly-salaried court munajjims at the time.

Comparing taqwīms compiled by different authors for a single year can provide intriguing insights into the intellectual, cultural, and even political history of the era. Such comparisons also help us identify more accurately the shared conceptions and/or diverging elements among diverse almanac-makers.

The two surviving almanacs from the year 919/1513, for instance, based their computations of celestial positions upon different astronomical tables. In his taqwīm, Yūsuf b. ‘Ōmer el-Sā‘atī utilizes the Zīj-i Ulugh Beg, whereas the anonymous author of the other surviving almanac uses the Zīj-i Muḥaqqaq of Shams al-Dīn Muḥammad Wabkanawī, which was completed over an observational program of more than forty years in Maragha and Tabriz.

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72 See Appendix C for the full list of taqwīms examined for the chapter. Aydı̇n Sayılı also states on the basis of al-Maqrīzī’s historical account that during the Fatimid times, different munajjims were producing and presenting distinct taqwīms. See: Sayılı, The Observatory in Islam, 151.
73 These are Arkeoloji Müzesi Ms. 1607/1-2, BnF Turc 183, and TSMK Revan 1711/14.
74 These are respectively TSMK Bağdat Ms. 321, TSMK Revan Ms. 1711/13, and TSMK Emanet Hazinesi Ms. 1712.
where Ghāzān Khan (r. 1295-1304) founded an observatory.  

75 Apparently, the computations made by the anonymous almanac are slightly different than those of Yūsuf b. ʿŌmer el-Sāʿatī, which might have led to divergent astrological interpretations. For Yūsuf b. ʿŌmer el-Sāʿatī, the revolution of the solar year would take place 10 hours and 15 minutes into Friday night, 3 Muḥarram 919/11 March 1513; whereas the anonymous author sets the moment as 1 hour, 19 minutes and 14 seconds into the same night.  

76 Consequently the horoscopes they calculated for the year-transfer are different from each other. According to the computations of Yūsuf b. ʿŌmer el-Sāʿatī, the ascendant would be in Pisces, whereas the anonymous compiler finds it in Aquarius.

When astrological interpretations are taken into consideration it is relatively difficult to determine whether or not the variations in the scope of astrological forecasts among different almanacs are really caused by slight variances in computations of astronomical data. Especially from the late fifteenth century onwards, as the impact of the Samarqand mathematical-astronomical school became more influential among Ottoman practitioners of astral knowledge, Ottoman taqwīm makers allocated an even larger space to the elaboration of celestial parameters as the necessary “scientific” ground for casting their specific astrological predictions. Nonetheless, as discussed in greater detail in the first chapter, many of these astral experts were also aware of the epistemological limits of the science. For them, the celestial parameters and influences are infinite, yet the human mind and lifespan are inadequate to the task of discerning

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76 Cf. TSMK Emanet Hazinesi Ms. 1710, 10b and TSMK Revan Ms. 1711/10, 228b.
all of them. Therefore, the best one could do is to adopt a conjectural interpretive approach based upon experience.77

Their interpretive freedom, however, was always restricted by the conventions of astrological principles. That is to say, since astrology was a conservative craft and the qualities ascribed to celestial objects, astrological houses, and stellar positions were largely delimited by previous authorities; there was little room for creativity for the practicing munajjim in interpreting a particular celestial situation.78 For example, the practicing munajjim did not have the freedom to arbitrarily interpret a hypothetical celestial configuration ruled by the planet Mars with themes and vocabulary ascribed to another planet. Moreover, almanac-makers almost always followed a boilerplate narrative progression in their astrological predictions. All of these features make it difficult for the modern historian to separate the “historical” wheat from the “astrological” chaff.

Nevertheless, the limited vocabulary and restricted creativity in astrological predictions provide the modern historian with the ability to detect with relative ease anomalous usages and unusual references. The comparative analysis of astrological predictions in the two surviving almanacs of the year 919/1513, for instance, reveals that the anonymous author’s remarks are slightly richer in terms of less-commonly used references. For the ease of discussion, I will focus

77 One of the stock phrases cited by many taqwīm writers reads as follows: “har chand idrāk az kulliyāt-i in fann qāṣir va az juz ʾiyātash mutaʿaddid ast ammā bar sabīl-i ghalaba-i ẓann va tajārib-i ahli fann kalima-i chand navashta mī shavad.”

78 The best example is a draft of a later sixteenth-century taqwim that I was able to locate in the Bibliotheca Medicea-Laurenziana in Florence. In this draft, the anonymous munajjim apparently put all the formulaic remarks about the fortunes of different social categories with leaving several blanks that were to be filled later with specific dates and/or names of categories. See: BLM Or.

On the conservative nature of astrological craft, also see: Hilary Carey, Courting Disaster: Astrology at the English Court and University in later Middle Ages (London: Macmillan, 1982).
on the respective predictions in these two almanacs regarding the conditions of wars and battles.

Both almanac writers describe, before elaborating their predictions, the detailed combination of astronomical and celestial parameters upon which they built their interpretations. However, the combinations selected by these two compilers are not identical. For instance, the anonymous compiler uses in at least two cases the relative positions of Mercury, whereas in Yūsuf b. ʿŌmer’s presentation of astral parameters Mercury plays no role. Despite divergences in the cited parameters, the corresponding astrological interpretations of each compiler still sound quite similar. For Yūsuf b. ʿŌmer, the parameters he found important portend the emergence of disputes, struggles, battles, and slaughter. Instigators will be busy with causing sedition, and sinful people and roughnecks will triumph over noble individuals. According to Yūsuf b. ʿŌmer, majority of these signs will appear in the eastern lands, in Iraq, Alexandria, Egypt, Hijaz, Damascus, Turkistan (bilād-i Turk), Yemen, Nihavand, Tabriz, the environs of Gilan, Fars, Azerbaijan, Tabaristan, some of the cities in Rūm, and in the lands of infidels.79 Like Yūsuf b. ʿŌmer, the anonymous compiler raises the possibility that many massacres and seditious acts will occur in the upcoming year as the instigators prevail. The locations in which the anonymous compiler expects these omens to emerge are the Mediterranean islands, Istanbul, Alexandria, Ghazni, the environs of Tarsus, Diyarbakir and Kurdistan, Hamadan, Isfahan, Ray,

79 TSMK Emanet Hazinesi Ms. 1710, 13a [those locations common with the other taqwīm of the same year are highlighted]: “dar īn sāl nizāʾ va mujādala va muhāraba va muqātala bisyār bovad va mufattīnān va ahl-i sharr dar nahj-i fitna va fāsād va iḥdāz-i sharr gūshāsh konand va dar aṭrāf va javānīb ahl-i sharr va fitna dar taḥrīk-i sharr va fitna majīd va sāʿī bovand va bi-muhāraba va muqātala qiyām namāyand va dozdīhā va zadān-i rāyhā va kaṣrat-i luṣūs va galaba-i ashrār va runūd va avbāsh va raṣīdan-i muẓirrat az ʿishān ba-mardom-i jallīl ‘l-qadr. Aḵsar dar vilāyat-i mamālīk-i Mashriq va ʿIrāq va Iskandariyya va Miṣr va bilād-i Ḥijāz va Shām va bilād-i Turk va dasht-i ‘Arab va Yaman va Nihāvand va Tabrīz va aṭrāf-i Gīlān va Fārs va Āzarbāyyān va Ṭabaristān va dar baʿz-i vilāyat-i Rūm va bilād-i kafara bisyār bāshad.”
Herat, Ferghana, Sistan, Damascus, the Persian Iraq, the Hejaz, Yemen, Azerbaijan, and finally Ardish.  

At first glance, these geographical references appear to be definitive signifiers, alluding to the political and religious denominations of the region. No matter how tempting it may be to take these references as an objective inventory of the immediate historical and political context, by scrutinizing a considerable corpus of taqwīms one realizes that the exact same references are used over and over by different almanac-makers. Such vague and repetitive wording serves well the dual purposes of munajjims, who on the one hand carefully refrain, as part of their professional concerns, from referring to exact locations, yet at the same time wittily mobilize readers’ opinion, expectations, and anxieties toward certain fixed interpretations.

I will delve more into the problem of dealing with the vague and repetitive language of taqwīms later in the chapter, but for the time being I would like to focus upon the Ardish reference of the anonymous compiler, as a rare instance of the category in the entire corpus of Ottoman taqwīms from the mid-fifteenth to the mid-sixteenth century, it deserves a special consideration. Unlike Ardish, the categories of Tabriz and Azerbaijan, which modern scholars might also tend to associate with the Safavids, were already among the common stock of references in earlier taqwīms. In the almanac prepared the year 895/1490, for instance, the anonymous compiler discusses in a separate section the fortunes of the inhabitants of Tabriz.

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80 TSMK Revan Ms. 1711/10, 231a [those locations common with the other taqwīm of the same year are highlighted]: “bisýārī khūnīkhtan va koshtan dar īn sāl va zūhūr-i a’dā va ḥarakat-i lashkarhā va ghalaba kardan-i dozdān va muṣfīdān va aḥl-i shāh va faṣād va būdān-i dozdīhā va khīvānāthā va qīṭālḥā va nāḥb va gārāt va tāḥkht va sūkht dar bā‘-i jāyḥā va dar īn sāl aḵsār-i īn tā‘-i ṣīrāt dar jāz-i bāḥr-i Rūm va Ḥuṣantarīyya va Iskandariyya va Gāznā va navāḥi-i Tarsīs va Āmād va Ammān va Akrād va aḥl-i jibāl va Ḥamādān va Ḥisfān va Rāv va Hurāt va Ḥaḷvān va Fargānā va Sījīstān va Shām va Irāq-i ‘Ajam va Ḥījāz va Yāman va Āzarbāyjān va Ardish bā-zūhūr āyad.
without any inflammatory remarks.\textsuperscript{81} The other locations to which this anonymous compiler dedicates individual sections as part of his annual predictions are Istanbul, Egypt, Herat, Samarkand, Shiraz, the Indian subcontinent (Hind), Mecca, Medina, and so on and so forth.\textsuperscript{82} Thus, what we see in the \textit{taqwīm} of 895/1490 is rather a repetition of canonical geographical categories instead of a deliberate invocation. In the case of Ardabil in the two 1513 \textit{taqwīms}, however, it is hard not to associate it with contemporary Ottoman perceptions of the Safavid problem, as it otherwise occurs so seldom in \textit{munajjims’} compositions. Quite intriguingly, apart from the anonymous compiler of the \textit{taqwīm} 919/1513, Qāḍī-i Baghdād, who fled before Safavid expansion and took refuge in Ottoman lands, extensively used the category in his \textit{taqwīm} of the year 913/1508.\textsuperscript{83}

Tracing the use of aberrant categories throughout the extant \textit{taqwīms} not only divulges the immediate personal and communal concerns and anxieties of their expected audiences but also hints at the currencies of ideological discourses of their times. In one of the three extant \textit{taqwīms} of the year 909/1504, Salmān-i ‘Ajam surprisingly goes into specifics by saying that during the current water triplicity a \textit{khārijī} and \textit{mudda ’ī} would rise and attain the throne as well as the crown (\textit{tāj va tākht}) in Iraq, and would impose new customs and laws (\textit{rusūm va āyīn-i nav

\begin{footnotesize}
\textsuperscript{81} TSMK Kandilli Ms. 365, 14a-14b: “\textbf{Hāl-i} [bold in the original text] Tabrīz va ṭavābi ’-i ān: dar nīṣf-i avval-i sāl ʾahvāl-i ahl-i īn bilād māʾ il ba-nīkī bovad va mulūk va salāṭīn-i īn diyār rā naqīl va ḥarakat va safar dar bīṣh āyād va sakht-dil va pur-kīn bovand va raʾāyā va ṣavāmaʾ-ʾn-nās va akābir qaviʾ-ḥāl va khūṣ-rūzgār bovand va dar muntasīf-i ākhir-i sāl ʾahvāl-i īn vilāyat māʾ il ba-ẓaʾaf gozarad mulūk va selāṭīn-i īn buqaʾ mutaraddiduʾl-ḥāl va mutahayyiruʾl-ʾafkār bovand va raʾāyā va ṣavāmaʾ-ʾn-nīs va akābir nuḥūṣāthā va ṭa khrīḥā dar umūr-i khūṣ mushāhada konand va zulm va sitam mulāhāza konand.”

\textsuperscript{82} TSMK Kandilli Ms. 365, 14a-16a.

\textsuperscript{83} British Library Ms. Or. 6432, 35a, 51b.
\end{footnotesize}
In a similar vein, the anonymous *taqwīm* of 911/1506, which was apparently presented to prince Selīm, interprets the expected solar eclipse of the year as the misfortune of a ruler from the Fourth Clime, more specifically, of the *Pā(dī)shāh-i Tabrīz.* Unlike earlier references to Tabriz as a general geographic category, this novel “padishah of Tabriz” label continued to be used in subsequent *taqwīms* from the reigns of Selīm I and Süleymān I. Besides such quasi-specific remarks reflecting Ottoman preoccupations with the Safavid problem, one can also find anomalous items in the category pertaining to the “infidels.” The most obvious example crops up in the *taqwīm* of the year 925/1519 in which a certain Ėače Kemāl makes explicit remarks on the *Rīm-pāp* (the Pope of Rome), invoking the need for a campaign in the west (*batu*) and specifically toward the island of Rhodes, which comes to the fore for the first time in the entire corpus of Ottoman *taqwīms.*

The analysis of anomalies is easily extended to titulature and the vocabulary of sovereignty. As extant Ottoman *taqwīms* were dedicated to the reigning sultans, and in a few cases to princes aspiring to the throne, they are extremely rich in expressing notions of sovereignty ascribed at different times to Ottoman rulers. By examining the terms by which the almanac-makers addressed their patrons, it is possible to get a sense of ideological orientations and experimentations undertaken at the court. It is true that these dedicatory passages stand as

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84 TSMK Emanet Hazinesi Ms. 1712, 2b: “*khārījī va muddaʿī dar īn qirān dar mamlakat-i ʿIrāq ba-tāj va takht rasad va rusūm va āyīn-i nav nahand ve dar īn qirān quvvat-i ālīʿi kasānī bāshad ki ālīʿi īshān muvāfīq bāshad bā ālīʿi sāl-i qirān ya vatadi bāshad az ālīʿi sāl-i qirān.*”

85 TSMK Revan Ms. 1711/5, 111a: “*chūn dar fašl-i ṭābīstān kūsūfī vāqīʿ mī shavad dar burj-i Asad dalīl ast bar zaʿf va nikbat-i mulūk ḥāṣṣa pādishāhān-i mashriq va ʿīlīm-i rābiʿ va ʿafāt-i pāshāh-i Tabrīz vallāhu āʿlam.*”

86 In much later sixteenth century *taqwīms*, one can even find direct references to, for instance, Shāh Tahmāsb.

87 TSMK Emanet Hazinesi Ms. 1695.
just another example of the politics of patronage in pre-modern court life, where every artist and author was expected to show his/her gratitude to the patron on bombastic terms with the hope of strengthening their relationship. However, as taqwīms’ sphere of influence was not solely restricted to the sultan, and their (astrological) contents evidently circulated, mostly by word of mouth, among contemporary court elites, the honorifics used therein for the reigning sultan became especially important and endowed taqwīms with a certain propaganda value.\footnote{In the European context, before the popularization of print technology, the almanac makers used to read annual astrological predictions publicly to the university community before New Year’s Day. See: Steven Vanden Broecke, \textit{The Limits of Influence: Pico, Louvain, and the Crisis of Renaissance Astrology} (Leiden: Brill, 2003), 30-1. There is no direct evidence for a similar practice in the contemporary Ottoman world, yet the rise of burlesque almanac genre among the late-fifteenth and early sixteenth century Ottoman literati, who largely imitated the language of taqwīms to mock certain group of people in the society, is a significant evidence as to the dissemination and circulation of astrological predictions outside the palace circles. For the examples of contemporary burlesque almanac genre, see Mehmed Çavuşoğlu, “Zati’nin Letayif’i II,” \textit{Türk Dili ve Edebiyatı Dergisi} 22 (1977), 143-161. One of the earliest examples of this genre, which became more popular from the seventeenth century onwards, is a certain Vahyī’s narrative composed apparently in 1496 for Selim I. See: British Library Or. 3289. For the seventeenth-century examples, see: Körprüüzade Mehmed Fuad, \textit{Kayıkçı Kul Mustafa ve Genç Osman Hikayesi} (Istanbul: Evkaf Matbaası, 1930).} Moreover, unlike other textual products that are composed quite sporadically, the annual character of taqwīms makes it possible to chart the contents of titulature, and changes therein, on a yearly basis.

The close examination of the titulature sections in different taqwīms reveals that mid-fifteenth century almanacs are richer in terms of references to celestial and eschatological themes. Especially in the case of the title ṣāḥib-qirān (“The Master of Conjunction”), mid-fifteenth century taqwīms provide the only elaborate astrological discussions of this status, which became commonly accorded to Ottoman sultans. The title itself is derived from the cosmic significance of the Great Conjunction of Saturn and Jupiter, and was systematically used in the
post-Mongol era to signal a ruler’s aspirations and predestination to world conquest, in the mold of Alexander the Great and Chinggis Khan. Although the term predates Tīmūr and was in frequent use during Seljūq times, it is mostly after Tīmūr’s adaptation of the title that the term became a major component of subsequent political discourse in the Turko-Persian world. It is not entirely clear when exactly the Ottoman ruling elites decided to integrate this notion into their ideological baggage, but mid-fifteenth century taqwīms clearly show that the term was given ample use within the vocabulary of sovereignty.

The anonymous author of the taqwīm of the year 849/1446 extensively uses the title ṣāḥib-qirān as the defining attribute of Murād II (r. 1421-1444; 1446-1451). In the preceding chronology, the compiler describes the Sultan as, among other things, the ṣāḥib-qirān of all contemporary tācdārs (“crown-bearers”) and begs. In the section where he starts expressing annual astrological predictions, the anonymous author delves into an even more thorough discussion of Murād’s status as ṣāḥib-qirān. He urges his readers to know that (şöyle bilesiz ki) Murād II came to the world as the ṣāḥib-qirān of the age (‘āleme ṣāḥib-kirān düşmüşdür) and the sound of his sword would buzz all over the globe. The celestial proof of his status is that,

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90 In the course of the sixteenth century, the term began to be heavily used in non-courtly, popular historical and literary production as well. For the use of the term in a masnavī written for Selīm I, see Derviş İşık Şemsi, Deh Murg-i Şemsi, ed. Mahmut Kaplan (Manisa: Celal Bayar Üniversitesi, 2003). For the extensive deployment of the term in a versed chronicle written by Mevlānā İsā for Suleymān, see Barbara Flemming, “Ṣāḥib-Kirān und Mahdī: Türkische Endzeiterwartungen im ersten Jahrzehnt der Regierung Suleymān,” in Between the Danube and the Caucasus, ed. György Kara (Budapest: Akadémiai Kiadó, 1987), 43-62.
91 Oxford Bodleian Library Hunt. Donation 46, 3a: “Sultān Murād hān bin Muḥammed hān pādīşāh oladidan beri...ki cemī’-i Osmān oğullarının fahrı ve selçukidir ve pādīşāhların güzidesi ve yegânesidir ve ‘ālem kavminin ḥayrîsî ve zamâne beglerinin ve tācdârlarının ṣāḥib-kirānîdûr.”
according to the horoscope of his accession to the throne, the ascendant was the 28th degree of
the sign Virgo. The ruling planet of this sign is Mercury and, at the time of his (second)
accession to the throne, Mercury was extremely auspicious. The anonymous munajjim does not
explain it here explicitly, but as assigning the malefic planet Mars as the ruling planet of the
ascendant of Mehməd II’s (first) accession to the throne in the year 1444, he explicitly contrasts
the fortunes of Murad’s second rule to Mehməd’s brief first rule. All in all, the celestial
indicators are clear proof for Murad II’s being the şahih-qirān of the age.92

The use of şahih-qirān never fully disappeared in the titulature sections of later taqwīms,
yet it also never enjoyed as much prominence as in the taqwīm of the year 849/1446—no matter
how contrived the astrological reasoning was. In addition to the term şahih-qirān, new notions

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92 Ibid., 16b [the parts in bold are written with red ink in the original text. The underlined parts
are for emphasis].: “ve ale’t-tahşiş hususiyet birle bizim padişahımız Sultân Murad şah
üzere olsun ... ki dâ’imâ ra’îyet(i) hoş durat ve nevâhî ider ve sıfat ve merhamet
nazarlaryla nazar ider ve dâd virür ve ‘adl gösterir ve cemi’ yaradılmış halka hayr şanur ve
ihşânlar kıur ve cümle ‘alem ʿáltı’ adlı ve âmânâ sûyesinde âsûde ve emnîn ve râhat geçerler
gice ve gündüz leyl ve nehâr devlet ve ‘omrî izdiyâdına çok çok du’âlar iderler. ʿAltı te’âlâ
mustecab ide inşâ allâh te’âlâ ve hapus te’âlâ ʿomrîne çok çok yollar berekâtılar virsîn âhîr ve
ʿâkibet hayr olsun sa’adetle ve devlette manşûr ve muzafer mü’eeved ve mü’ebbed dünya
türdükça tërîsun ve devletle ezeli ve ebêdi ve sermedî çok çok yaşasın zîrâ kim cemi’ yaradılmış
halk haçret-i ‘alîyyelerinden şâkir ve zâkir ve râzîdur ʿaltı te’âlâ haçret-i ‘alîyyelerinden râzî
olsun âhîrî ve ʿâkibetî hayr olsun imân ve islâm ve Kurân-i ‘azîm yoldaş olsun ve cemi’
yaradılmış halkuñ du’âsi gice ve gündüz leyl ve nehâr buniñ überinedir makbûl ve mustecab
olâ...ve dâhi söyle bilesiz kim padişâh-ı ‘alem ve hûdâvend-i benî Âdem ve a’del ve müsîfik ve
ekrem Sultân Murad han hazretleri ‘aleme şahîh-kîrân düşımsüdür gerekir kim etrâf ve eknâf-i
‘êlemde sîvî ve âvâzîsi ve kiluç sarken ve garben ve ba’den ve qurben ve tahten ve feyken ve
berren ve bahren çiûreye ve devlet-gûr [devlet-gîr]? ola ve himmet(î) ‘âli ve kadri yîce olub
padişâhumuz Sultân Murad han padişâhzâdesîyle Sultân Muhammed hân birle çok çok
yvasanlar ... Şöyle bilesiz kim Sultân Muhammed hân jâli’î cülüs idübi tahta oturduğu vakidê
ʿAkreb burcuüdi ve yulûzî Merrıddur ve âna padişâhumuz Sultân Murad hânîn jâli’î cülüs ve
duhûl bildi kim Brûsâ şehrine girûb salтанan tahtında geçûb serîr-i memlekette karîr itidî vakîtde
Sünbûle burcunûn 28 derecesiüdi ve 24 da’iﬁkasıyla Sünbûle burcunûn ve Cevzâ ve saltanat
burcunûn îssî ‘Uṭâridîr ve ‘Uṭârid ol vakt be-ġîyet kuvvetliyîdi ve Zûhre padişâh jâli’î idür...ve
şöyle bilesiz bu sebebedendir kim padişâhumuz hazretleri ‘azzama’llâh iqâdârahum wa’a la’llâh
shânahum’ ‘âlemde şâhîh-kîrân olduguna wallâhu a’lam'.”

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were gradually integrated at different times. The taqwīm of the year 858/1454, for instance, employs for the first time the term Mehdiyyū’z-zamān (the expected Messiah of the age) – among many other titles – for the new conqueror of Constantinople, Meḥmed II. In his taqwīm for the year 902/1497, ‘Abd al-Karīm b. Mawlānā Sinān unusually adopts the term sālār-i memālik-i Irān (the vicegerent of the lands of Iran) for Bāyezīd II. A few years later, Salmān-i ‘Ajam described Bāyezīd II as the quṭb-i aflāk-i ḥaqīqat (the pole of the spheres of truth). Salmān’s association of qutb status with Bāyezīd II seems to be the earliest expression of this notion, which eventually became one of the defining attributes of the sultan, widely used by contemporary literati. All of these titles and notions of sovereignty might, of course, be interpreted as stylistic preferences of their authors, unworthy of much attention. However, given contemporary elites’ apparent attention to the contents of taqwīms, the underlying propaganda value and ideological currency of sultanic titles passing in these texts should be not disregarded at all. As munajjims cultivated their authority as experts in celestial and therefore divine knowledge, the celestial significance they ascribed to the reigning sultans might have carried considerable significance among the targeted audience, the elites atop the Ottoman state and culture.

IV. 4. Taqwīms and Ottoman History Writing

As shown, almanacs evince important dissimilarities stemming from the identities of their

94 TSMK Bağdat Ms. 314, 2b.
95 TSMK Emanet Hazinesi Ms. 1712, 2a.
96 See Kutb-name, ed. İbrahim Ongun and İsmet Parmaksızıoğlu (Ankara: TTK, 1980).
compilers and/or the immediate historical-political contexts in which they were composed. These divergences extend, over time, to general structural changes in the contents of taqwīms. In terms of language, for instance, there is a shift from the mid-fifteenth to the late-sixteenth century.\textsuperscript{97} While most extant taqwīms from the mid-fifteenth century were written in plain Turkish, almost all surviving almanacs from the reign of Bāyezīd II—which number over 30—are in Persian, likely reflecting a cultural reorientation at the court of the latter. Subsequently, as a result of the wider \textit{Ottomanization} process of the cultural and bureaucratic life in the course of the sixteenth century, the language of taqwīms gradually shifts again, from Persian to a refined Ottoman Turkish.\textsuperscript{98}

As with language, the contents of taqwīms also underwent a serious transformation from the mid-fifteenth century over the course of the sixteenth. The surviving mid-fifteenth-century almanacs, which recall the late-fourteenth-century Eretna taqwīm, constitute compendia of useful and entertaining knowledge, combining history, astronomy, astrology, and divination. In addition to the detailed chronology tables summarizing the history of the world, one can find almost side-by-side mathematical explanations of horoscope calculations and vernacular statements of omen divination. By late-fifteenth and early-sixteenth century, however, many of these more demotic

\textsuperscript{97} For the details of this language shift, see Appendix C.
components were on the verge of decline, as the contents of annual *taqwīms* became increasingly mathematicalized and technicalized. While almost none of the mid-fifteenth century *taqwīms* have detailed ephemeris tables, the almanacs from the time of Bāyezīd II onwards often include them. The individual charts on different divinatory practices such as dream interpretation, palmoscopy, and Aristotelian discourses on the conducts of wars and/or friendships were also gradually purged from the *taqwīm* texts.

This transformation in the structure of the genre is best traced through examination of the reverse-chronology sections. Before discussing the historical context of this transformation, it remains to lay out first the contents of these chronological lists.

It is not, however, the primary aim of this section to evaluate the authenticity of the historical information therein or its significance for early Ottoman history. In the 1950s and 60s, the fifteenth-century Ottoman *taqwīms* containing reverse-chronology tables attracted the attention of Turkish scholars, and some of these lists were published as separate editions.\(^99\) In the absence of authentic historical materials and archival documents from the early fifteenth century, Ottoman historiography welcomed these tabulated lists of historical events and used their data to supplement the available knowledge of early Ottoman history. Osman Turan and Nihal Atsız pioneered the use of these sources for historical purposes by publishing the chronology tables of some almanacs from the first half of the fifteenth century. Drawing mostly upon the work of Turan, Halil İnalcık was the first to import this new information into his study of the reigns of

Besides incorporating into his text the historical details introduced by the almanacs, such as the details about the first enthronement of Mehemmed II or Ottoman-Karamanid relations in the first half of the fifteenth century, İnalcık also strove for an intertextual analysis of taqwīms and contemporary chronicles. In that regard, his most significant contribution was the discovery that some late-fifteenth-century chronicles and historical narratives had used the almanacs as sources. According to İnalcık’s study, Uruc Bey’s chronicle and at least one of the anonymous histories of the Ottoman dynasty written in the late fifteenth century drew upon the tabulated historical data of the almanacs. In a similar vein, Victor Ménage also demonstrated, a few years after İnalcık, that Neşri (d. <1520), another dynastic historian of the Ottoman house, used the chronology sections of taqwīms as a source.

Although both İnalcık and Ménage focused only upon the chronology sections of the almanacs for historiographical purposes and ignored the remaining astrological contents, as their predecessors Turan and Atsız had, it was Halil İnalcık who percipiently asserted that “the munajjims in the [Ottoman] court can be regarded as the first vakʿanūvīs.”

İnalcık, of course, does not mean here the office of court historian, which, as is well-established, did not come into being until the late seventeenth century. His association of munajjims with recorders of chronology and writers of history is worth pursuing indeed, for the

authority of *munajims* as experts of the science of the stars, and hence the reckoning of time and chronology, has a long history. Despite the variety of ways of keeping time in past cultures, its passing (in, e.g., years, seasons, months, days, or hours) was in principle measured in reference to the movement of planets, particularly that of the sun and the moon. The history of astronomical observation was always closely linked to the history of reckoning time; and, as discussed in earlier portions of the dissertation, the broader definition of horological reckoning includes all kinds of temporal computations ranging from establishing a year’s calendar to determining auspicious moments to embark upon an activity. In addition to the regular and relatively easily observable movements of the luminaries, the configuration of other planets was also considered a key component in computing time for different purposes. The conjunction astrology and the accompanying genre of astrological histories, as mentioned in especially the first chapter, could be regarded as examples of such computations.

As experts in tracking the motions of celestial objects, the *munajjims* in the service of early Ottoman sultans must have been also responsible for computing and recording “time” in the broadest sense of the word. We do not have any surviving text by a *munajjim* from the Ottoman court prior to the fifteenth century. Yet the surviving *taqwīms* from the first decades of the fifteenth century are perfect pieces of evidence of the *munajjims*’ wide temporal responsibilities, past, present, and future. In addition to chronologically tabulating major events since the Creation, *munajjims* undertook a variety of tasks such as preparing the calendar of the year, specifying the conversion of dates according to different calendric systems, composing arduous electional tables (*ikhtiyārāt*) for acts to do or avoid on certain days or at certain times, and spelling out forecasts/astrological judgments (*aḥkām*) as to the fortunes of the upcoming...
year.

The tabulated lists of historical events found in the first few folios of some of the fifteenth- and early-sixteenth-century almanacs are composed of brief entries, each referring to a major political, religious, or natural incident in history. Events are dated (with a few exceptions) not by the Hijrī year in which they occurred, but as having happened so many years before the almanac was drawn up. Each entry is cast in the form, “[This many] years have elapsed since….” (“…dan berū X yıldır”/“az gāh-i….X sāl ast”). The entries are usually grouped under different headings, reflecting the historical understanding of their compilers—which proves quite similar to the contemporary or subsequent Muslim writers of universal history such as Khwāndamīr (d. 1535 or 1536) in his Habīb al-siyar or Muṣṭafā ‘Ālī (d. 1600) in the Kūnhū‘l-ahbār. Accordingly, the first section of the chronologies in the almanacs is devoted to the Creation of the universe and the canonical history of pre-Islamic prophets. In this section, the prophet Idrīs is almost always given a special importance as the originator of the scientia astrorum, and the date the science of the stars was “descended” (“‘ilm-i nūcūm Īdrīs‘e ineli” / “nuzūl-i ‘ilm-i nujūm ba-Īdrīs”) to him is specifically mentioned. The next section covers the life of the Prophet and early Islamic history through the end of the Abbasids. Despite the temporal span of this period, this section in the almanacs is usually the least detailed one and only covers—unless the sub-section on major Sufis and ‘ālims is incorporated here—the birth and death of the Muḥammad, the four Rightly Guided Caliphs, Ḥasan b. ‘Alī, Ḥusayn b. ‘Alī, and a few Abbasid caliphs from the early

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part of the dynasty. The Umayyads are almost always omitted and the entry on Karbala is followed only by the rise (khurūj) of Abū Muslim. Following this section comes the most comprehensive list tabulating the political and natural events in the Islamic East during the Saljuq, Mongol, and post-Mongol eras. The history of the Ottoman dynasty is generally appended to this section, and the entries on Ottoman history begin with the emergence (khurūj) of ʿ Osman Ghāzī and end with the most recent major event.

Although this scheme is followed as a general principle in different almanacs and the set of events covered is quite standard, it is worth noting that chronology lists are not entirely identical. Firstly, the discrepancy in the amount of elapsed years is a constant matter of conflict. Especially when events from distant past are in question, such as the Creation or history of pre-Islamic times, the discrepancies grow even larger. Given the difficulty of establishing an accurate chronology for pre-Islamic history, a fact attested by medieval scholars like al-Bīrūnī themselves; it is not at all unexpected to find serious inconsistencies between the chronological lists of different almanacs. Yet sometimes such temporal discrepancies occur even in the records of events from the more recent past. For instance, as to the birth of Meḥmed II, the taqwīm of the year 843/1439 says that eight years have passed, thus establishing the birth year of the prince as 835; whereas for the taqwīm of the year 856, twenty-three years have passed since the birth of Meḥmed II, leading to a two lunar-year discrepancy between the two taqwīms.

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106 In his encyclopedic work on different chronology systems, al-Bīrūnī often reminds of his readers the difficulty to establish consistency among dating systems. See: Al-Bīrūnī, Kitāb al-āthār al-bāqiya ‘an al-qurūn al-khāliya, tr. C. E. Sachau as The Chronology of Ancient Nations (London: 1879), in passim.

107 Cf. Atsız, Osmanlı Tarihine Ait Takvimler, 105 and TSMK Bağdat Ms. 309, 3a. One can argue here that one of these two taqwīms might have used the lunar calendar in calculating the
Apart from these discrepancies in the number of years elapsed, the chronology tables also vary depending with respect to the scope of events covered. Some almanacs are much more comprehensive than others, recounting a greater range of political and natural occurrences. Thus it is not unusual to find a reference to a historical incident unrecorded by other almanacs. For the contents of the section on biblical and prophetic history, the variety is quite limited and almanacs basically repeat the same list, starting with the Creation and/or fall of Adam from the heavens and covering other prophets up to Muḥammad. In the section on early Islamic history, too, the list is more or less standard. With the exception of the taqwīm of the year 843/1439, there is not a single entry on the reigns of the Umayyad caliphs. The same taqwīm is also evidently the only one that addresses (briefly) the Samanids, Buwayhids, Khwarizm-shahs, and the Atabegs. Almanacs also vary relative to the inclusion of events related to the politico-cultural and environmental history of the Turko-Mongol Islamic East. The accession of Abū Saʿīd Bahādur Khān (d. 1335), for instance, is recorded only in three taqwīms, while all except the two lists the enthronement of Barqūq (d. 1399). In particular, with regard to the recent Anatolian and Ottoman past, variety is almost a norm. The outburst of plague in the Karasi region, which apparently occurred in the year 749/1348-9, is only recorded by the taqwīm of 824/1421 and is disregarded by the rest. In a similar vein, the full solar eclipse and the appearance of a celestial novelty that allegedly took place in the year 790/1388 are only recorded in the taqwīm of

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108 Atsız, Osmanlı Tarihine Ait Takvimler, 92.
109 The two taqwīms that did not record Barqūq are the 894/1489 taqwīm at TSMK Bağdat Ms. 310, and the 900/1495 taqwīm at TSMK Revan Ms. 1711/11, as the chronology tables in these two taqwīms are only related to the history of the Ottoman dynasty.
110 Atsız, Osmanlı Tarihine Ait Takvimler, 25.
Likewise, the early Ottoman conquests in Balkans and Anatolia do not enjoy the same degree of attention in each almanac. These examples could be multiplied with further discrepancies, and as such reveal what the individual almanac-maker deemed important and unimportant when compiling his list. The selections of the almanac-makers could be further tied to their geographical affiliations and professional backgrounds, as some of them might have been simultaneously affiliated with different courts in the Rum-Anatolia region in the first half of the fifteenth century that might have equipped them with local information on adjacent regions. The death of İlyās Beg, the son of Menteşe, for instance, is only mentioned in the taqwīms of 856/1452 and 858/1454. In a similar vein, the fire in Samsun in 824/1421 is only recorded by these two taqwīms. The death of Yā'qub Çelebi b. Germiyan is also deemed important only by the compiler of the taqwīm of 835/1432.

Having outlined the main characteristics of the chronology sections integral to certain—not all—fifteenth century Ottoman taqwīms, one now raises two important questions earlier scholarship has largely neglected: What might be the reasons for incorporating these chronology sections in the first few folios of some almanacs and why did these tabulated lists of historical events begin to disappear by the early sixteenth century?

As mentioned several times before, scholarship on earlier Ottoman taqwīms focused almost exclusively on chronology tables and disregarded the remaining, much larger astronomical and astrological sections, unfortunately reinforcing the assumption that taqwīms were only produced for chronological purposes and erroneously implying that all almanacs

111 Ibid., 69.
included tabulations of historical events. Quite contrarily, however, a systematic investigation of the surviving taqwīms from the fifteenth through the seventeenth centuries clearly shows that compared to the number of taqwīms without chronological tables, the ones with tabulated historical information are indeed quite limited. In around hundred taqwīms I have personally examined, there are no more than sixteen with chronology sections. In fact, from the late fifteenth century onwards, the chronology sections became sparse and by the first half of the sixteenth century they almost entirely disappeared. The reasons for this dwindling are hard to reconstruct; it might be a useful starting point to discuss the initial use of historical chronologies in taqwīms and their eventual elimination as a contribution to debates in the scholarship about the rise of Ottoman history writing in the late fifteenth century and the changing dynastic claims of the Ottoman establishment.

As we have already seen, the use of chronological tables in annual almanacs is not an Ottoman innovation. In addition to the Eretna taqwīm mentioned above, there is a surviving Rasulid taqwīm, currently preserved in the Bibliothèque nationale de France, which went unnoticed in Varisco’s study on Rasulid almanacs. This taqwīm was produced in 841/1437 and in both size and comprehensiveness its chronology section surpasses both the Eretna and Ottoman taqwīms.113 The compiler of this lengthy almanac covers in over seventy folios the detailed history of Yemen from 439/1047-1048 onwards with a special emphasis upon the history of the Rasulid dynasty. In the first eight folios where the anonymous compiler of this taqwīm lists the names and reigns of rulers from diverse civilizations and historical traditions, the author perfectly exemplifies the universal historical vision embedded in almanacs. Accordingly,

113 BnF Arabe Ms. 4609.
he first starts with a biblical history that ends with a short entry on the prophet Moses. After this section comes the list of rulers from the Banu Isra’il. Israelite rulers are followed respectively by Babylonian, Persian, Greek, and Roman kings. Finally he jumps to the history of the Prophet and the caliphs, and situates the history of Yemen and the Rasulid dynasty within this framework. The wording he uses, to wit, “the transfer of rule” (intiqāl al-mulk) from one civilization to another, clearly reflecting the almanac-maker’s understanding of the unfolding of history, was fairly typical among scholars in his time.\(^{114}\)

As the Eretna and Rasulid examples manifest, chronology tables, far from being distinctive to the Ottomans, were among the favorite components of almanac-makers across the Islamicate world in the fourteenth and fifteenth centuries. The almanac-makers often prepared their own tables by simply reproducing the lists at their disposal after making necessary calculations based upon the year they lived in. For instance, the taqwīm of the year 842/1439, produced by a certain Ibrāhīm b. shaykh al-munajjim wa’r-rammāl, was likely used by another munajjim 44 years after its composition, for on top of each date recorded in the chronology list of this taqwīm is there a marginal note, showing the new total number of years (added by 44) that have elapsed.\(^{115}\) It is thus not surprising not to find much creativity among taqwīms when the historical chronology sections are in question.

It is still worth asking though whether this period is in fact exceptional in terms of the number and extent of historical chronology sections. The growing importance attached to genealogical debates in the Eastern Islamic world from the thirteenth century onwards would have provided fertile ground for such inquiries. The genealogical debates in the period served the

\(^{114}\) BnF Arabe 4609, 2b-8b.

concerns of ruling dynasties in the post-Mongol Islamic East in need of legitimizing their authority in the absence of universally accepted principles of rule. The caliphal ideal had been demolished by the fall of the Abbasid dynasty at the hands of Hülegü Khan in 656/1258, and the later dissolution of Chinggisid rule made the bloodline of the Altan Urugh, the “Golden Family” of Genghis Khan, less directly conclusive. The genealogical and chronological tables of almanacs helped connect the history of a ruling dynasty to a prestigious, universal, and sacred past. As we have already seen in the surviving taqwīms from the Rasulid, Eretna, and Ottoman contexts, the history of each respective dynasty is always situated within the taqwīm’s historical scheme as a culmination of the unfolding of universal history, granting the ruling dynasty a divinely ordained status.

Although the genealogical agendas of the post-Mongol world may have played a role in the growing incorporation of chronological tables into almanacs, it should also be noted that the inclusion of historical information in almanacs was a much older tradition. Unfortunately no taqwīm survives from earlier centuries with a historical chronology section to allow us a comparison. Nonetheless, we should recall Biruni’s saying in his Tafhīm that almanacs in those times did contain lists of historical information. More important than this little piece of information, Biruni argued that the main motive of almanac-makers in including such chronological sections was “the intellectual pleasure found in such things.”

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117 Biruni, The Book of Instruction in the Elements of the Art of Astrology, 188.
Bīrūnī’s words are invaluable as they remind us of the importance in medieval Islamic belles-lettres of the pedagogical motives and intellectual pleasures underlying the employment of a certain literary device or composition. As we have already seen, the use of tables and charts was favored in different literary genres mostly for the practical reason of presenting the required information to the reader in a succinct and easily understandable fashion. Here, tabulating important historical points concerning the prophets and distinguished rulers must have served similar concerns of practicality. Yet, as Bīrūnī underlines, the type of the information is as important as its form. Although we lack serious studies in the perception and recognition of history as a literary activity in past cultures, it is self-evident that the knowledge of major past events was considered an integral part of courtly and intellectual life, and the Ottoman munajjims maintained this tradition in their taqwīms through chronological tables.

We still need to explain, however, why in the early sixteenth century these chronology tables were on the verge of decline. Did they become obsolete in the eyes of their readers, particularly the rulers? Did munajjims become uninterested in simply repeating the same information each year, mechanically adding one more year to the sum of years elapsed? Is there perhaps a correlation between the simultaneous rise of dynastic history-writing and decline of annalistic chronology tables?

Given the dearth of contemporary sources illuminating the reception of taqwīms, it is quite difficult indeed to provide substantial answers for each and every question. We can nevertheless correlate the changes in the contents of taqwīms to the changing dynamics of political and literary culture at the Ottoman court in the late-fifteenth and early-sixteenth centuries.
The general consensus in the relevant historiography about the rise of Ottoman history writing maintains that during the reign of Bāyezīd II, a new historical consciousness arose, ushering in the composition of the first Ottoman dynastic histories.118 Although there were earlier Ottoman histories, written mostly in Persian verse in the mid-fifteenth century, through the sustained attempts of Bāyezīd II gained the history writing a new momentum from the late fifteenth century onwards.119 This process had seemingly two different phases. During the 1480s and early 1490s, the type of dynastic histories that Bāyezīd II supported, such as the works of Neşri or Rūhī, were interested in the simple recounting of events in plain Turkish with an annalistic format.120 These earlier examples of dynastic histories also attempted to portray the Ottomans as heirs to the Seljuq dynasty. Thus, in terms of both style and contents, the historical chronology sections of taqwīms were in harmony with contemporary dynastic histories.

By the early sixteenth century, however, due partly to the shifting cultural orientations of the court and partly to the growing desire of Bāyezīd II to represent his rule and dynasty as the most prestigious—both politically and culturally—among contemporary houses, leading literati were commissioned to compose comprehensive histories of the Ottoman dynasty in eloquent and

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120 Fleischer, 235.
learned style.\textsuperscript{121} Bāyezīd’s project bore impressive fruit: Idrīs Bidlīsī (d. 1520) composed the *Hasht Bihisht* in elaborate Persian, and Ibn Kemāl produced an Ottoman history in high Turkish prose. Unlike earlier annalistic dynastic chronicles and the chronology sections of almanacs, these novel works were historically more analytical, as well as linguistically more elegant.\textsuperscript{122} Besides the stylistic and linguistic elements, the new dynastic history writing also gave voice to the emboldened claims of the dynasty that increasingly demarcated itself from the simple Seljuq legacy and emphasized instead the unmatched and inevitable success of the Ottoman house.

Literary tastes’ moving away from annalistic presentations and the innovative historiographical attempt to distinguish Ottoman rule by detaching the history of the Ottoman dynasty from the earlier Rum-Anatolian tradition, thus, stands as a working hypothesis to explain the gradual decline of the chronology sections of *taqwīms*.\textsuperscript{123}

\textbf{IV. 5. Taqwīms and Contemporary Recognition}

Despite the fact that historical chronology sections and detailed charts for various divinatory practices eventually disappeared from *taqwīms*, astrological predictions remained resilient and came to characterize the genre. As we have already seen, the majority of studies on

\begin{itemize}
  \item \textsuperscript{122} Fleischer, 239.
  \item \textsuperscript{123} There are two surviving *taqwīms* produced in the first decade of the sixteenth century that have chronological sections on the House of Osman, the 913/1508 *taqwīm* of Ḥādi-i Baghdād and the 915/1510 *taqwīm* of ʿAbd al-Raḥmān munajjīm. But as the first one was composed by a newcomer to the Ottoman court and the second compiled for Bāyezīd’s favorite son Aḥmed in Amasya, they might not have been aware of changing trends at the imperial court.
\end{itemize}
Ottoman taqwīms gives precedence to their non-astrological components, which has inevitably led to the rise of misconceptions about the real function and value of the taqwīm genre. The literature on the chronology tables, for instance, deliberately presents these tabulated lists of historical information as the only significant part of taqwīms and completely ignores the wealth of astrological materials by saying that such “superstitious” elements—which were among the taqwīms’ raison d’être—have nothing to offer serious historical inquiry. As a result, the rich prognosticative contents and their potential use for historians have escaped the eyes of modern scholars.

Aside from the latent desire not to besmirch the Ottoman past with astrological “superstition” and “irrationality,” the established scholarly convictions about the insignificance of these sections are also justified on the ground that astrological contents of taqwīms are “near-platitudes, equivocations, and the artful hedging of bets,” making them unreliable, if not worthless, as historical sources. Considering the often boilerplate progression of astrological predictions in taqwīms, this objection is not entirely unfounded. Yet, it would be a huge waste of primary sources to categorically dismiss a written tradition that steadily filled pages and pages over five centuries.

The astrological and prognosticative materials in the surviving taqwīms can be classified roughly into two groups. The first group, which we can define as “year-specific” contents, includes the detailed annual astrological predictions (aḥkām-i sāl) that munajjims prepared on the

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124 Turan, 8.
125 This is also true for early modern European almanac-prognostications. See: Robin Bruce Barnes, “Hope and Despair in Sixteenth Century German Almanacs,” in The Reformation in Germany and Europe: Interpretations and Issues, ed. Hans R. Guggisberg and Gottfried G. Krodel (Sonderband Washington: Gütersloh, 1993), 440-461.
basis of the horoscope of the intended year. What I mean here by “specificity” is not that the astrological forecasts are explicit about specific individuals or events, but rather these predictions are theoretically produced by the *munajjim*’s interpreting the horoscope of a particular year after calculating the celestial positions at the exact moment the sun enters Aries (i.e., the year-transfer, *taḥvīl-i sāl*). In this first group we include the brief astrological judgments accompanying the monthly calendar tables, as *munajjims* also calculated and tabulated the horoscope of each month (i.e., the Sun’s entrance into a new sign) with a few remarks on the general *akhām* of the month.

The second group consists of a wide array of prognosticative materials, ranging from long and tedious electional tables listing acts to perform and avoid at certain times, to individual diagrams and brief explanations for different sorts of divinatory techniques including dream interpretation or palmomancy, i.e. prognostication derived from the observation of bodily spasms and jerks. The contents of these prognosticative instructions are not strictly tied to a specific year and are usually incorporated by the fifteenth century almanac-makers to enrich and “anthologize” their occult compendia. Moreover, the first group of astrological contents is almost always an integral part of annual *taqwīms*, whereas the inclusion of any or all of the components from the second group is at the discretion of the *munajjim*.

As we have already mentioned, astrological predictions about the upcoming year are expressed on vague terms and modern historians must be aware of the risks of treating their contents as transparent. As astrology was (and still is) a highly conservative practice with quite

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126 I borrowed the term from David Roxburgh, who identified in the late medieval Persian artistic context an “anthologizing mode”, “a practice of making digests and compendia on different topics that peaked under the Timurids and their contemporary dynasts.” See David Roxburgh, *The Persian album, 1400-1600: from dispersal to collection* (New Haven: Yale University Press, 2005).
restricted, rigid interpretive mechanisms, any particular reference in a single *taqwīm* does not always need to be related to a burning issue in the immediate historical context.

One method proposed above to deal with the problem of vagueness and repetitive character of astrological predictions/references is to examine *taqwīms* as a cluster of texts and read them in conjunction with others. Initial comparisons can be made of those *taqwīms* written by a single compiler across time or *taqwīms* written for a single year by different compilers. Juxtaposition makes it possible to track more accurately the repeated patterns and deviating elements.

Another method of comparison that could provide even more precise answers about the real value and contemporary recognition of the astrological predictions in annual *taqwīms* is to read the contents of *taqwīms* and contemporary historical narratives in tandem with one another in order to detect whether the astrological predictions expressed in almanacs influenced contemporary discourse or even manipulated certain political and imperial decisions. This path might also lead us to address the elephant in the room, to wit, whether these predictions and prognostications expressed in quite vague terms did have any concrete influence on their audience and their decision making-processes.

In the following pages, I will illustrate how the predictions in *taqwīms* were deemed important by the contemporary Ottoman elites—at least in the early sixteenth century—no matter how vaguely they were expressed. For that purpose, I will read sections from select *taqwīms* together with contemporary historical narratives to demonstrate how the *munajjims’* interpretations of the celestial data at a particular moment (i.e., his astrological predictions) were later reinterpreted by a broader interpretive community, primarily composed of individuals
affiliated with the court.

In the taqwīm prepared for the year 920/1514 and presented to Sultan Selīm I before Navrūz of that year (i.e., Muḥarram 13, 920/March 10, 1514), the anonymous munajjim calculates, using the Ulugh Beg tables, a full solar eclipse beginning nine hours and 33 minutes into Sunday night, Jumādā II 28, 920/August 20, 1514. The eclipse will begin to slow (makth), ten hours and 23 minutes into the same night, reaching total eclipse at ten hours and 33 minutes. The sun begins to reappear at ten hours and 43 minutes, fully emerging from eclipse 41 minutes into Monday morning.

As for the astrological interpretation of this astronomical data, the anonymous munajjim says the following:

"Because the total eclipse occurs below the horizon in this latitude (ufq), its effects in this region [viz. Rūm] are relatively minor. [By the same token], because it occurs above the horizon in the Persian lands (diyār-i 'Ajam), its effects are most strongly felt in that region, including the region of the Euphrates, Mosul, Fars, Hamadan, the Sawad of the Arab Iraq, Ferghana, Herat, India, Makran, eastern Khurasan, Ahvaz, Tabriz and Isfahan, and will persist for two years and twelve days, being the strongest at the beginning of this period. It signifies the affliction (nakbat) of a person of a great stature (shakhṣī-i 'ażīm al-shān) in the region of the Euphrates, Mosul or the Persian lands. But God knows best the true nature of things."

The categories and geographic references employed by the anonymous munajjim in his astrological predictions of the expected solar eclipse are not that striking, as he refers to vague

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127 TSMK Revan Ms. 1711/11, 266b.
128 Ibid.: “chūn vasaṭ-i kusūf dar in ufq taḥta 'l-arz ast, asar-i kusūf dar in diyār kamtar bāshad va chūn vasaṭ-i kusūf dar diyār-i 'Ajam fāvqa 'l-arz ast ta 'šīr-i kusūf dar ān diyār va kanār-i Firāt va Mūsul va Fārs va Hamadān va savād-i 'Irāq-i 'Arab va Farḡhāna va Harāt va Hind va Makrān va sharqī-yi Khurasān va Ahvāz va Tabrīz va Isfahān ba-vujūd āmad va do sāl va duvāzdah rūz in ta 'šīr bi-mānad va mu 'azzam-i ta 'šīr dar avā 'il ba-zuhūr ājad va dalīl-ast bar nikbat-i shakhṣī-i 'ażīm al-shān dar aṭrāf-i Firāt va Mūsul va diyar-i 'Ajam wallāhu a 'lam bi-ḥaqā iq al-umūr.”
geographic categories such as the Euphrates, Mosul, and the lands of the ‘Ajam. Yet he skillfully concentrates the attention of the reader on the foretold individual, who is said to be of exalted status. The anonymous munajjim’s remarks become all the more meaningful when they are juxtaposed with an intriguing passage of the Selīmshāhnāme of Idrīs Bidlīsī, which explains the Ottoman victory in 1514 over the Safavids in the Battle of Chaldiran in astrological terms:

“Among the indicators of the divinely-granted victory that made good the purpose of the lord of all sultans of the age [i.e., Selīm] and the triumph realized by the allies of that holy [sovereign] against foes perverted in religion and government were a number of configurations (ṣūrat) apparent to the sight of perpicient analysts of the motions of the heavenly spheres, this in accordance with the principles laid down by sage observers of the fixed stars and planets (rāṣidān-i marāṣid-i nujūm-i ṣavābīt va sayyār) and the meteorological phenomena that occur under cycling heaven. The first [of these indicators] was the total solar eclipse that occurred on Sunday night, Sha‘bān 28, 920 (vuqū-ʿi kusūf tamām būd ki dar Yakshanbih bist-o-hashantom Sha‘bān), in the descending lunar node in the sign of Virgo, with Monday’s dawn breaking on the eastern horizon during the height of the eclipse. Drawing on [professional] intuition (tahaddus) and [long] experience (tajriba), astrologers (arbāb-i aḥkām-i nujūm) universally agree that the fact that the radiant body [of the Sun] remained dark for 41 minutes after its dawning in the east was a clear indicator of the calamitous and total destruction of the power of the king of the east (tamām-i nakbat-i zavāl-i davlat-i khusrau-i mashriq-zamān) and the brilliant dawning of a manifest victory from the west, this to protect religion and serve as a model warning [of the woe that awaits] tyrannical foes on the Day of Judgment, as heralded by “The Hour has drawn nigh: the Moon is split” (Q 54:1). And indeed, as occult synchronicity (gharāvīb-i ittifāqāt) would have it, at the moment of eclipse the army of the depraved shah, emperor of the east, was arraying itself in opposition to the army of the sultan of the west. That is to say, it was evident to perceptive observers that the body of that Sun, eclipsed by the darkness of blackly oppressive enemy forces, became ever more ascendant precisely with the increase of the thick blackness of that foundation of darkness and the evil fortune of that black-hearted faction, such that the fully-eclipsed Sun broke forth from the east amid the spheriform tents of the Qizilbash: thus did the Sun, wreathed in perfect beauty and glorious majesty, rise from the west (such a reversal and opposition being one of the conditions that will herald the Hour of Resurrection).”

There are number of striking issues for our purposes here as to the role taqwīms might have played in shaping and mobilizing contemporary political debates and decisions. The work, which narrates the incidents immediately before and during the reign of Selīm I and which aims at underlining his deeds and achievements, was in fact never finished by Idrīs Bidlīsī during his lifetime and could only have been compiled by his son in late 1560s from the scattered notes of his father.\textsuperscript{130} Therefore, we are not in a position to clearly identify whether it was really Idrīs who wrote the above-quoted passage, and if so, when exactly he composed it. Yet, the quality of the Persian prose and the accurate historical details about the chronology of the Battle of Chaldiran make it highly likely that Idrīs himself originally composed the passage.

The hard astronomical data given in Idrīs’s passage about the date and duration of the expected solar eclipse almost entirely coincides with the calculations of the anonymous munajjim in the annual taqwīm presented to the Palace before March 1514. The only information that differs is the month in which the eclipse was expected to occur. However, this was likely a slip of his son’s pen when copying Idrīs’s notes after so many years or by Idrīs himself while writing down the passage, as the date, which is designated as Sunday (yakshanbih), could not simply be in the month of Shaʿbān, which corresponds to Wednesday, October 28, 1514, almost two months after the Battle of Chaldiran. The twenty-eighth of Jumādā II, however, makes perfect sense at it corresponds to Sunday, August 20, 1514, immediately before the outbreak of the battle. Apart from the exact month of this eclipse, Idrīs’ passage regarding the direction (on the eastern horizon) and duration (41 minutes) of the eclipse also accords precisely with the information given in the taqwīm.

\textsuperscript{130} Ibid., 12.
The most important aspect of Idrīs’s remarks, however, is his dual-layered astrological interpretation of the solar eclipse. By referring to munajjims’ interpretation of the solar eclipse, Idrīs (re)interprets the celestial phenomenon as a clear sign of the total destruction (nakbat) of the power of the Safavid shah and a manifest victory for the Ottoman sultan. Thus the vague interpretation of the anonymous munajjim in the annual taqwīm finds its eventual fulfillment and explanation. Whether or not Idrīs had the chance to read and review that particular taqwīm, the use of raw astronomical data and the wording of astrological interpretations make a strong case about the political and public recognition of the astrological predictions elaborated in taqwīms.

Idrīs’s remarks are just one example of how astrological predictions might have directly shaped contemporary expectations and debates. Besides stimulating public discussions, the astrological predictions of taqwīms also affected imperial decisions. It is indeed not surprising, as many chronicles and historical narratives often mention in passing that a certain military expedition was initiated or a certain imperial building’s construction began upon an auspicious hour of the munajjims’ designation. What the parallel reading of taqwīms and chronicles/historical narratives shows unequivocally that such remarks should not be dismissed as simple rhetorical devices, for the instructive words of munajjims as to the propitious times to embark upon certain individual and imperial enterprises were definitely taken seriously, as already manifested in the dissertation by archival documents and manuscript sources.

To that end, I will focus here on the taqwīm prepared for the year 925/1519 by the Ḥāce Kemâl and contrast it to another contemporary Selîmnâme, written by Keşfî Meḥmed Çelebi (d. 1525). As briefly mentioned before, Ḥāce Kemâl’s taqwīm, especially its astrological predictions are surprisingly explicit in its references and use of categories. He, for instance, talks at length
about the uneasiness in the west (Batu), specifically in the land of the Franks (Frengistân), and comments upon the probable Ottoman victory against the Pope (Rîmpâp) and the conquest of the island of Rhodes. He, however, cautions the Sultan not to embark upon any campaign in the first couple months of the year, because the relevant astrological variables betoken the advisability of delaying the action at least past the first few months of the year. For Ḥāce Kemâl, the campaign should be undertaken during the fourth or fifth month of the year.\textsuperscript{131}

Quite intriguingly, at the end of his narrative, Keşfî Meḥmed Çelebi discusses Selîm’s decision to call off his planned campaign against the island of Rhodes. According to Keşfî, Selim was eager to initiate a campaign against the island but after learning about the words of munajjims who reached a consensus in their taqwîms saying that the beginning and the middle of the year would be extremely inauspicious, he decided to give up the campaign.\textsuperscript{132}

In just a few years after Selîm’s unfinished attempt, the Ottomans were able to seize the island under the commandment of Selîm’s newly enthroned son Süleymân, but even before Süleymân’s campaign against the island, astrological conspiracies in the contemporary taqwîms seem to have distracted the palace. As already mentioned in the previous chapter, according to ʿĀşîq Çelebi (d. 1571), a certain ʿÖzrî, who was at the time the qâdi of Varna (today in Bulgaria) besides his being a poet, presented to the court a taqwîm during the campaign against the island of Rhodes. In his taqwîm, ʿÖzrî Çelebi allegedly predicted that the island of Rhodes would

\textsuperscript{131} TSMK Emanet Hazinesi Ms. 1695, 6b: “\textit{delâʾîl sâyledir ki bu yılîn ibtidâsında ḥâżret-i pâdisâh-i ʿâlem-penâh kendü nefsine sefere çıkmayalar... ama sefare çıktıkları vakit dördüncü ve besinci ay ola, vallâhu ʿâlam}”
\textsuperscript{132} SK Esad Efendi Ms. 2147, 133b: “\textit{ve hem ehl-i nücûm müttefikan′aleyh bu yılîn evâ′ili ve evâsıtı gâyetde şüm ve nihâyetde mezmûmdur diyû takvîmlerinde tahrîr ... ʾîldilar. Ol sebebben sefer emri te′hîr buyuruldı.”
eventually be conquered but the siege would be prolonged and cost the lives of many soldiers.  

Embittered by these predictions in the taqwīm, Süleymān asked his retainers to bring the author of this taqwīm to his presence. Upon hearing the sultan’s order, ‘Ōzrī first visited a close friend of his, Muṣṭāfa the geomancer, and they together interpreted his ascendant, reaching the same conclusion that he would die during his visit of the palace. According to Āṣık Çelebi’s anecdote, ‘Ōzrī died exactly as he foretold.

The taqwīm of ‘Ōzrī is not extant today; therefore, unlike the cases of Idrīs Bīḍlīsī and Keşfī, we could not read this anecdote in parallel with the actual predictions from the original almanac. In fact, the anecdote recounted by Āṣık Çelebi is likely apocryphal, for contemporary archival records about a certain poet named ‘Ōzri clearly document that as late as Muḥarram 19, 940/August 10, 1533, he received gifts and allowances from the court. No matter what really happened to ‘Ōzri Çelebi, and how and when he lost his life, Āṣık Çelebi’s anecdote is still valuable as it conveys a contemporary perspective pertaining to the discursive power of the taqwīms.

A last piece of evidence for the extent to which contemporary (ruling) elites deemed astrological predictions important is a non-anecdotal, archival one: a petition, written apparently by a dismissed munajjim and delivered to Sultan Bāyezīd II, likely through the end of his reign. In this anonymous petition—or in fact a letter of pardon—the dismissed munajjim asks the sultan’s mercy for his recent failure to present the court with taqwīms. He explains it by referring first to his lately shifting scientific interests, as apparently he has become interested in medicine.

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133 Aşık Çelebi, Meṣaʿirüʿ-š-Šuara, ed. Filiz Kılıç, v. 2 (İstanbul: Suna ve İnan Kıraç Vakfı, 2010), 1064.
134 Ibid.
135 Kamil Kepeci 1764.
He then reveals the real reason of his failure by saying that as he becomes older and death draws near, it excites more grief and uneasiness to deal with the stars, especially with the *judicium*.\(^{136}\)

In the last part of the petition, the anonymous dismissed *munajjim* desperately pleads with the sultan and concludes the petition by asking the sultan to reemploy him in his service.

Besides revealing an interesting detail about the epistemological suspicions of a practicing *munajjim* as to his own craft, the petition is a clear proof that sultans—at least some of them—inquired after, and waited impatiently for, the annual astrological counsel of the *munajjims*, and failing to produce the annual astrological prognostications in a timely manner potentially entailed a *munajjim*’s loss of position.

All in all, the *taqwīms* that *munajjims* produced and presented the Ottoman court on a yearly basis are invaluable sources modern scholars from various subdisciplines should pay more attention. Not only the *taqwīms* can allow modern historians of science to easily track the scientific models and astronomical methods preferred by different practitioners. They also provide, through especially the detailed astrological predictions on the fortunes of the upcoming year, complementary details and colorful insights about the burning political and ideological matters of the time, which were subject to constant change. Though it is a challenging task to glean the valuable historical information out of the often repetitive and hackneyed prose of prognostications, that the *taqwīms* were composed on a yearly basis helps the modern researcher detect more accurately the diverging elements to further associate them with the problems and

\(^{136}\) TSMA E. 10159/145: “*dar īn ayyām muyassar nashod ki bi-istikhrāj-i taqvīm mashgūl shavad....Az chand jiḥat yaki az ishtīghāl bi-muṭāla‘a-i ṭibbiyya ammā mānī‘-i kullī ān ast ki īn kamīna rā vaqt-i ārtihāl nazdīk ast va ishtīghāl bi-nujūmiyyāt siyammā bi-āḥkāmash mustalzim-i qasāvat-i qalb ast.*”

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debates of their times. The testimony of contemporary historical narratives and a few archival documents about the recognition of munajjims’ astrological predictions in the taqwīms also reveals the need to appreciate the value of these texts for historical purposes. It should be also noted that taqwīms were not the only surviving textual product of the munajjims. The astral experts were also engaged in producing other types of annotated horoscopes that they composed for the occasions of birth, enthronment of the sultan, or the calculation of the auspicious moment for undertaking an imperial enterprise. The next chapter will discuss the significance of this genre on the basis of few surviving examples from the fifteenth and sixteenth century Ottoman world.
Chapter Five—From Bolstering Royal Claims to Expressing Self-Aggrandizement: Political and Personal Dynamics of Casting Horoscopes

V. 1 Introduction

In the previous chapter I delved into one particular, and seemingly the most prevailing, form of horoscope production identified within the astrological practice of (solar year) revolutions (tāḥvīl-i sāl). In annual taqwīms, munajjims and other individuals conversant in the astral sciences interpreted the horoscopes they prepared on the basis of the key moment of sun’s annual ingress into Aries, i.e. the beginning of the solar year, as well as its monthly entrance into other Zodiacal signs. Contrary to the conventional wisdom that tends to take taqwīms simply as calendars, ample amount of relevant texts descending from the fifteenth-and sixteenth-century Ottoman realm has demonstrated that astrology played a central role in the taqwīm tradition.

There are other examples of horoscopes produced for different forms of astrological practice such as nativities and elections.¹ As I already outlined in greater detail in the first chapter, the genre of nativities (mawālīd) rests upon the fundamental assumption that the celestial configuration at the time of birth has an enduring impact on a person’s destiny. Whereas the branch of elections (ikhtiyārāt) intends to determine the most propitious moment to start a specific enterprise or perform an activity, such as enthronement of a ruler, embarking upon a military campaign, or laying the cornerstone of an imperial building. Although the amount of such horoscopes descending from the period in question is not as many as the extant taqwīms, a

few surviving documents, including the nativity of Meḥmed II and the horoscope produced for the construction of the Süleymaniye mosque complex, will be scrutinized in this chapter with an eye toward examining the intersecting personal and imperial dynamics of the astrological practice.

The reasons are not clear why we have surprisingly so little extant nativity books and occasional horoscopes, although the practice itself was quite widespread given the frequent references in contemporary sources. In addition to numerous anecdotes about the practice that regularly feature in the chronicles and historical narratives, manuscript sources also contain various personal horoscope charts (zāyicha), often in the standard square or rectangular format divided into twelve sections, scattered in the colophon page or the recto of the first folio (ẓahr al-

2 Even in the surviving horoscope for the construction of the Süleymaniye complex, which I will discuss in detail below, the author Riyāżī explicitly refers to other horoscopes he prepared for the birth and accession day of Süleyman. Unfortunately none of these horoscopes have survived our day, unless they remain undiscovered in some obscure manuscripts. One should also recall the discussion in the taqwīm of the year 849/1446 about the horoscope of Murād II’s second accession to throne or the elaboration of Idris Bīdlīsī on Bāyezīd II’s horoscope, both discussed in more detail above. Similar references could also easily be found in earlier historical narratives. In his Gazānâme-i Rūm (ca. 1456), Kāşīfī recounts that when Meḥmed II was born, Murād II called for the munajjims and asked them to interpret the birth horoscope of his son. Apparently, munajjims interpreted the celestial configuration as the definitive sign of Meḥmed II’s being a ṣāhib-qirān. See: Ebrahim M. Esmail, “Kâşīfî’nin Gazânâme-i Rûm adlı Farsça Eseri ve Türkçe’ye Tercüme ve Tahlili.” (MA Thesis, Mimar Sinan Fine Arts University, 2005), 14. Kīvāmī narrates in his Fethnâme-i Sultân Meḥmed that when Meḥmed II ascended the throne for the second time, he had the munajjims interpret the horoscope of his ascension. Their interpretation was that Meḥmed II would rule the world like Alexander the Two-horned. See: Ruşan Türkmen, “Kīvāmī, Fethnâme-i Sultân Meḥmed.” (MA Thesis, Firat University, 2006), 192. Such anecdotes in the earlier Ottoman sources follow the examples richly elaborated in preceding and/or contemporary Persian chronicles and historical writings, such as Kḥwāndamīr’s Ḥabīb al-siyar or Sharaf al-Dīn ʿAlī Yazdī’s Zafarnāma. For example for the curious story of Mavlānā ʿAbd al-Lisān munajjim’s calculation and interpretation of the birth horoscope of Ibrāhīm Sultān b. Shāhrukh (d. 1435) see Yazdī, Sharaf al-Dīn ʿAlī, Zafarnāma, ed. by Sayyīd Saʿīd Mīr Muḥammad Ṣādiq and ʿAbd al-Ḥusayn Navāʾī, v. 1 (Tehrān: Kitābkhāna Mūziḥ va Markaz-i Asnād-i Majlis-i Shūrā-yi Islāmī, 1387), 786-788.
These diagrams are not necessarily accompanied by an astrological commentary of the horoscope, but still hint at the prevalence of the practice.

One important reason of the scarcity of extant textual examples of these occasional horoscopes is the very personal nature of these materials. As Laurence Elwell-Sutton has already pointed out, since most of these horoscopes were of interest only to the individual or the specific occasion to whom/which they applied, their preservation across different generations was not an immediate concern. We should also take into consideration the oral nature of the astrological counseling, which I have already mentioned, as these natal charts or suggestions for elections might have been interpreted verbally on the spot.

In order to introduce the reader to the distinguishing characteristics of the materials this chapter will evaluate, i.e., the nativities and other horoscopes produced for electional purposes, it would be useful to start with comparing them with the taqwīms. First of all, in both taqwīms and nativities, the same standard mathematical and astronomical procedures were followed for casting the horoscope at the desired moment. Accordingly, the munajjim first determined the degree of the ascendant (ṭāliʿ), the Zodiacal sign rising above the horizon, by consulting the astronomical tables (zīj) or sometimes using an astrolabe, or even both. The next step was to demarcate all the other eleven astrological houses, so as to sketch the position of the Zodiac in relation to them at the designated moment. This operation is called the equalization of houses.

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3 These charts available in numerous Islamic manuscripts still wait to be thoroughly studied. For a general evaluation of the question in medieval European manuscript culture, see: Sophie Page, *Astrology in Medieval Manuscripts* (British Library/University of Toronto Press, 2002). On zāyīcha (horoscopic diagram), see: David Pingree, “Horoscope” *Elr*; Enrico Raffaelli, “Zāyča” *Elr*.

(taswiyat al-buyūt). Once the horoscope chart (zāyīcha) was drawn, the munajjim became ready to start prognosticating it.

Here emerges the fundamental difference between the ṭaqwīms and the nativities, because in the former case the calculations and ensuing prognostications are only for the particular year in question, whereas in the nativities munajjims needed to project the celestial calculations and astrological interpretations toward the temporal point that the newborn is expected to reach in terms of lifespan. In order to make these projections and establish the life expectancy of the newborn, the munajjims had recourse to calculating additional astrological variables such as the haylāj (indicator for the body), kadkhudā (indicator for the soul), tasyīrāt (prorogation or progression), firdārāt (planets ruling certain periods), or intihā’āt (profections), all of which are discussed in greater detail in the major examples of the zīj genre.⁵

Aside from the use of additional astrological indicators, another important difference between the nativities and ṭaqwīms is the timing of these calculations. In the ṭaqwīms, which were produced and presented before or around the time of Navrūz (i.e., the revolution of the solar year), calculations were made prospectively, to wit, the munajjims estimated the moment of the solar year transfer in order to make prognostications out of it. Whereas in the nativities, the munajjim makes retrospective computations on the basis of the information provided to him about the exact birth date of the individual. Although there is both textual and visual evidence implying that munajjims might have been in close proximity to the royal birth chamber, the

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⁵ The last major section in both the Zīj-i Êlkhānī and Zīj-i Ulugh Beg is solely devoted to the elaboration of these procedures. For the technical details of these indicators, see the very useful commentary and annotated glossary of astrological terms prepared by L. P. Elwell-Sutton in his edition of a horoscope descended from the Qajar period: The Horoscope of Asadullah Mirzā: A Specimen of Nineteenth-Century Persian Astrology, tr. and ed. by L. P. Elwell-Sutton (Leiden: Brill, 1977), 57-98.
detailed birth horoscopes at hand rather reveal that the nativities were produced after the munajjim was approached by the client, who was usually enjoying his/her her adult years and curious enough to ask the munajjim to prognosticate his/her destiny in the remaining years of his or her life. As part of this request, the client (or his/her deputy) usually provided the munajjim the original date of his/her birth. For example, in the nativity of the Timurid Mirzā Rustam Bahadur, produced in Muharram 822/February 1419 by a certain Yaḥyā b. Ṣimʿān al-munajjim al-Kāshānī, the munajjim refers to the initial calculation of the degree of the ascendant that was apparently recorded by an observer (of the sky) (rāsidī) at the original time of birth. In a similar manner, as we briefly mentioned about its contents in the second chapter, a petition was delivered to Bāyezīd II by an anonymous munajjim, who, apart from asking for permission to have access to certain books and instruments in the treasury, promised the sultan to prepare nativities for the princes Ḵorkūd and Ḵhūm if their birth dates are communicated to him.

As it was the case in previous chapters, the present chapter also does not set out to illustrate the complex methods and techniques used by the munajjims to cast horoscopes or verify the past calculations on the basis of modern computations. It has rather the sole purpose of

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7 Huntington Library Ms. HM 71897, 7b: “rāsidī ki bi-ālāt-i raṣad daraja-i ṭāli‘ maʾlūm konad ... az taḥrīr-i musavadda-i ki mavjūd būd. Chunān maʾlūm shod ki az shab-i mazkūr dah sāʿat gozashta būda ta zamān-i vilādet-i mubārak.”

8 TSMA E. 10159/6: “va agar ṭāli‘ hā maʾlūm nabāshad tārīkh-i vilādatā tašlīm namāyand tā baʿd az istikhrāj kayfīyyat-i ṭāli‘-i har yak rā chūnāncha az dalāʾ il-i mujūmī maʾlūm shavad ba-ʿarḍ rasānīda shavad.”
understanding what these extant occasional horoscopes could tell the modern historians about the complex political and patronage dynamics underlying their production and circulation. Unlike the taqwīm genre, however, the amount of surviving textual materials is significantly limited. Therefore compared to the comparative analytical examination of the numerous taqwīms from the fifteenth-and early-sixteenth-century Ottoman milieu, the treatment here will be more descriptive and sporadic. Here I will describe in detail two specific examples. One of them is a nativity produced for the sultan Meḥmed II through the end of his life. Although ʿĀṭūfī’s catalogue of the Palace library that he prepared in 1502-3 also lists the horoscopes of Cem Sultan and Bāyezīd II in the inventory, these texts have not survived our day.⁹ The second textual example that I will discuss even in more detail is Riyāzī’s curious horoscope that he composed around the year 1550 for the occasion of the construction of the Süleymaniye mosque complex.

V. 2. Nativity Books as a Means of Self-Propaganda

Immediately after arriving at the court of Meḥmed II and presenting him in December 1479 with his lengthy commentary on Țūsī’s Si faṣl (which he entitled Muwaḍḍih al-rusūm fī


There is an eighteenth century copy of Bāyezīd II’s horoscope, fragmentedly copied by a certain al-Sayyīd ‘Abdu’l-kerīm b. Muṣṭafa in Muharram 1177/July 1763. This copy consists of only five folios and does not contain the part on astrological judgments. In the horoscope, Bāyezīd’s birth date is set as 5 Muharram 851/March 26, 1447 and the birth place as Manisa. While this birth date complies with the overall consensus in the relevant historiography, his birthplace is usually considered to be Dimetoka. See: Kandilli Rasathanesi Kütüphanesi Ms. 396.
ʻilm al-nujūm), Khīṭābī was requested by the sultan to compose his nativity. The voluminous nativity was originally completed by him in 24 Rabī’ al-awwal 885/June 3, 1480, and another presentation copy was made ready before the sultan would pass away in May 1481. The horoscope begins with a standard invocation of God, to which are added several quotations from the Quran that refer to the heavenly bodies, the world of the unseen (a’lam al-ghayb), or the idea that human body is the microcosm of the universe. This is followed by a brief doxology in praise of the Prophet Muhammad. These rather standard textual components are then followed by a relatively long passage glorifying Meḥmed II and his rule. Among numerous strong appellations with full of celestial imagery, Khīṭābī particularly defines the sultan in this passage as the caliph of the epoch (khalīfat al-dahr), the imām of the age (imām al-zaman), and the khān to all the world rulers (khān-i khavāqīn-i jihān). He then swiftly records the birth date of the sultan, first according to the lunar Hijri system (26 Rajab 835) and then the Old Iranian/Yazdigerd era.

10 SK Esad Efendi 1997, 2b: “ammarani an yustakhraja ṭālī’ mawlūdihi al-maymūn wa yuḥaṣṣal min wilāyat mā huwa al-ʿāsl wa-l-qānūn li-yazhara min ithbātihi awdā’ al-suʿūd wa-n-nuḥūs wa yuʿrāf mā yuṣṭahṣala min sayrihā al-sanawī...”

11 There are at least two copies of this text. The one now located at SK Esad Efendi 1997 and composed of ninety folios seems to be the autograph copy of Khīṭābī. Not only the quality of the script seems very similar to the handwriting of Khīṭābī in his other works cited in the third chapter. In the colophon part of the copy Khīṭābī says that he first finished writing it in Istanbul in 24 RA 885/June 3, 1480. SK Esad Efendi 1997, 90b: “Tammat al-kitāb awwal ‘alā yad al-ʿabīd al-žaʾīf Khīṭābī al-munajjīm al-Jīlānī fī yawm al-arbaʿāʾ īshrīn Rabīʿ al-awwal min shahr [sic] sana khams wa ṣamānīn wa ṣamāna miʿa hijriyya nabawiyya fī baladiyyat al-Qustantiniyya.” Based likely upon this copy, another and more flamboyant presentation copy (composed of 264 folios) was prepared by the famous calligrapher of the time, Ghiyāth al-dīn Isfahānī. TSMK Yeni Yazmalar 830, 264a: “tammat al-kitāb al-ṭālīʿ al-mawlūd al-mubārak humāyūn khalladallāh taʿālā ūmrahū wa khilāfahu ʿalā yad al-majrūh al-haqīr Ghiyāth al-mujallid al-Isfahānī bi-dār al-salṭanat Qustantiniyya aslaḥallāhu shānuhū abadan.” Unfortunately its copy date is not specified, but Ghiyāth al-dīn’s wording certainly implies that it was produced when Meḥmed II was still alive.

12 SK Esad Efendi 1997, 2b. As for celestial imagery, Khīṭābī uses the following expressions: “āfitāb-i jalāl az ufq-i iqbal ʿulū kard” (for describing the birth of Meḥmed II), “khalīfat-i āfitāb-i falak-i mustaqīm, markaz-i dā’ira-i muqīm-i mihr, burj-i tajdarī dar daraj-i shahriyārī”
The author then gives a quick table of contents and briefly introduces the main chapters in the horoscope. Although he says that the text is composed of three chapters (ṣalāṣa abvāb), it would be more accurate indeed to group his overall scheme into two main parts: astronomical/computational (elaborated in between 3a-67a) and astrological/interpretive (67b-90b), because the three chapters Khiṭābī introduces in the beginning are only related to the specific astronomical/computational procedures. These are as follows:

i) Procedures undertaken to determine the degree of the ascendant (īstikhrāj al-ṭāliʿ);

ii) Procedures undertaken with the use of the indicators to establish the life expectancy of the newborn (haylāj and ʿafīyya al-kawākib);

iii) Procedures undertaken with the use of the latitude of the incidental horizons (ʿarūḍ al-āfāq al-ḥāditha).

Khiṭābī opens his elaboration by fixing the birth date of the sultan in the Old Iranian/Yazdgirdi era as Saturday, 2 Murdād 801. He then starts establishing the equivalent dates according to other temporal systems. As an indication of his intentions to show off his extensive knowledge in computational tasks, Khiṭābī here instructs, in the fashion of the zīj literature, how these calendric calculations can be manually made. After making, and showing how to make, painstaking calendric calculations, he establishes that the equivalence of the date in the lunar Hijri calendar (tārīkh-i ʿArabī) is 26 Rajab 835. The corresponding dates in the Rūmī/Iskandarī (tārīkh-i Rūmī) and Jalālī/Malikshāhī (tārīkh-i Malikī) eras are given respectively as 29 Āzar
māh (April) 1843 and 17 Farvardīnmāh 353.\textsuperscript{13} He later gives the place of the birth as Edirne (dār al-saltanat), which he says is located in the sixth clime. He then moves to the next section and fixes the exact hour of the birth as eight hours and four minutes into the Saturday evening, 26 Rajab 835/March 29, 1432. Here, like Yahyā munajjim in the horoscope of Mīrzā Rustam Bahadur, Khīṭābī refers to the notes of an anonymous observer that had recorded the birth date of the sultan.\textsuperscript{14} He further implies his surprise to have found this information already recorded, because as he says, in the absence of such recorded dates munajjims often have to appeal to instruments like the astrolabe (usturlab) or hourglass (shīsha-i sā’at) to retrospectively calculate the time of birth. However, in the case of Meḥmed II, there is no such need.

After setting the ground by inserting the date and place of the birth, Khīṭābī starts his lengthy exposition on the complex mathematical and astronomical procedures required for calculating the horoscope. Quite similar to the flow of narrative in other extant horoscopes from the Timurid realm, such as the famous horoscope of Mīrzā Iskandar produced by ʿImād al-munajjim or the horoscope of his half-brother Mīrzā Rustam Bahadur composed by Yaḥyā b. ʿImād b. Yaḥyā al-munajjim, Khīṭābī himself explains and exemplifies in a very detailed fashion (in almost two-third of the entire work (3a-67a)) those specific methods an erudite munajjim should adopt when preparing someone’s nativity. The methods he specifically mentioned include the namūdārāt of Ptolemy, Idris, Abū Ma’shar, or Zarathustra as well as the haylājāt, kadkhudāhs, and firdārāt. He also provides in a simple textbook format the minimum sufficient

\textsuperscript{13} Ibid., 3a-3b.  
\textsuperscript{14} Ibid., 4a: “ḥāfīzān-i vaqt-i vilādat-i bā-saʿādat-i humāyūn ba-taqārib va kitābat chunān rasāniyānd chūn sāhib-qirān bā-davlat va saʿādat az katm-i ṣadām-i mubārak ba-sahrā-yi vujūd nihād gozashta būd az shab-i shanbih hasht sā’at va chahār dagīqā taqrīban muvāqīq bā-bīst o shash-i māh-i mubārak sana 835.”

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knowledge on the dispositions of the stars and planets (ṭabāyi`-i sitāragān), indications of each astrological house and signs of the planetary aspects (ittišāl-i naẓarī).

It is partially true, in light of the extant annotated horoscopes from the Timurid realm, that such detailed explanations on the astronomical, mathematical, and astrological technicalities of the practice, which probably did not have any bearing on the patron sultans, were in fact dictated by the genre of the nativities. Every new munajjim might have felt the pressure to (re)produce these generic features and conventions of their scholastic endeavor in order to prove how well-trained s/he was as a munajjim. In fact the exhaustive comments upon these technical matters might have served two important purposes. On the one hand, the munajjim could create another opportunity for him/herself to demonstrate, in the presence of both the primary patron and contemporary practitioners, his deep knowledge in the different foundational units of the astral sciences. On the other hand, these explanations with exemplary cases and insertion of tables might have stood as useful training materials for the would-be munajjims.

Given the fact that there is almost no surviving manuscript evidence as to the extra copies of such lengthy horoscopes, and that those limited extant copies do not contain any rich marginalia that would have proved otherwise its heavy use by the past readers/students, it is quite difficult to say, at least for the period in question, that these texts produced for the royal consumption were also studied by contemporary munajjims for pedagogical purposes. The later centuries witnessed, however, the emergence of zāyicha collections, through which certain munajjims brought together several horoscope charts drawn for some of the recent political incidents as well as the decisive events in the Ottoman history such as the conquest of
Constantinople, the enthronement of Süleyman, or the battle of Mohaç.\textsuperscript{15} Although these copies are also devoid of reader notes, one may still consider, in the light of Monica Azzolini’s excellent study about the pedagogical uses of collected horoscope charts, as exercise notebooks of certain practitioners.\textsuperscript{16}

In Khiṭābī’s case, however, he shows his scholarly aspirations and ambitions to display his intellectual assets through painstaking quotations from, and detailed references to, some of the major authorities in the astrological lore including Ptolemy and Kitāb al-Thamara, Bīrūnī and his Taḥīm, Ghaznawī and his Kifāya, ʿAlī-Shāh Bukhārī and his Aqmār va ashjār, Hermes and the Kitāb al-asās, or Tūsī and his Zīj-i İlhānī. Somewhat similar to his lengthy commentary on Tūsī’s Sīfaṣ, by which he also likely aimed at convincing the sultan as regards to his level of expertise, the horoscope best serves for the self-interests of Khiṭābī, who was trying to establish a stable position for himself in the court hierarchy as an erudite munajjim.

Following his long discussion on the lots and the fixed stars as well as the concepts of the proragators, whose specific function is considered influencing the lifespan of the native, Khiṭābī finally turns to what was presumably the main justification for the entire work: the astrological interpretations of the celestial findings.\textsuperscript{17} He first starts with the general prognostications based upon the degree of the ascendant of Meḥmed II’s birth, which was established, according to his

\textsuperscript{15} See for instance Kandilli Rasathanesi Kütüphanesi 444. See also the Mücerrebāt of Muṣṭafā Zekī: SK İzmır Ms. 485.
\textsuperscript{17} SK Esad Efendi Ms. 1997, 67b: “Chūn az taṣḥīḥ-i daraja-i ṭālī’ va taʿyīn-i haylāj va kadkhudhāhāt va ʿarūd-i āfāq-i kavākīb va tasyīr-i avtād (...) fārīgh shodīm khāṣfīm ki āhkām-i davāzdaḥ khān[a rā mujmalan bayān konīm ba’d az ān āhkām-i har sāl ra ʿalā al-taṣfīl ūrād konīm.”
own calculations, the 22\textsuperscript{nd} degree of the Aquarius. Similar to the discourse produced in the taqwīms, Khīṭābī employs platitudes and vague references to praise the rule of Mehmed II. For Khīṭābī, as far as the indications of the horoscope are concerned, the owner of this horoscope would be firmly stationed in his throne. All of his measures would well serve to their purposes. Whoever dares to revolt against him or avoids fully obeying him would end up being a miserable and formidable one. He would be victorious over his rivals, and many sultans of the time would envy him due to his successes. Day by day his glory would intensify, and his generosity would keep pleasing the scholars, Sufis, and mystics. When his age would turn to 45 (solar years), there is a possibility that he would undertake a military campaign, at the end of which he would be victorious. His fame would spread over all corners of the world. When he would turn to 47, several mischievous individuals would try to provoke trouble and unrest. During this age, the balance of his blessed temperament would be disturbed, and the enemies and dissidents of his state would be in a stronger position. Nevertheless in the end they would be defeated at the blessed hands of the sultan.\textsuperscript{18}

As far as Khīṭābī’s projection for the sultan’s life expectancy is concerned, the turning point seems to be the year 60, as Khīṭābī particularly says this is the era when the owner of the horoscope may come close to the end of his “granted/gifted” life. Therefore he should be careful,

\textsuperscript{18} Ibid., 68a-70b: “ṣāhib-i ṭāli’-i humāyūn ... bar maqārr-i saḥnāt va ’azamat va pasand-i khilāfat va imārat thābit va rāsikh bāshand va nīkā-rāyī va khūb-andīsha va tīz-dhihn va rūshan-rāy bovand va ’āqīl va kāmil va khudāvand-i rāy va tadbīr bovand va dar ’avāqīb-i umūr fikrīya ba-ṣavāb andīshand va ba-har muhīm va kāri ki rāy āvorand akthar ba-ḥusūl payvandand va rūzgār bi-’azamat va hashmat godharānand va harkas ki bā ān ḥażrat sar az mutāba’ va ’ubūdiyat munharīf kārānād mahzūr va mānkūb kārā ... aḵsar avqāṭ tīr-i tadbīr bar hadaf-i ṣavāb zanand va bar a’dā muẓaffār va maṇṣūr gardand ... ba chashm-i salātīn maḥṣūd bovand.”
at that particular time, especially with the food he would eat and water he would drink.\textsuperscript{19} If nothing bad happens during that period, Khıtābī concludes, the owner of the horoscope would live until he would be 75 years old. Considering the likely timing of the production of this horoscope, which coincided with the last phase of Meḥmed II’s political career when controversies derived from the deterioration of his health condition were in circulation, these vague remarks and cautions as to the dietary measures of Meḥmed II are reflective of the atmosphere at the court of Meḥmed II.\textsuperscript{20}

V. 3. Choosing the Most Auspicious Time for the Sultan and the Self

An important aspect of the munajjims’ authority in measuring and interpreting time was to elect astrologically auspicious moments to start a specific activity. As regards to the elections of propitious moments, Ottoman chronicles and historical narratives are replete with references, albeit vaguely expressed, to the munajjims’ designation of auspicious hour. The periodic insertion of formulaic remarks (“bir sāʾat-i saʾd ve vakt-i meymūn” or “mūbārek sāʾat ve firūz-dem”) into historical narratives inevitably raises questions whether these fillings on pages point


\textsuperscript{20} For the detailed political history of the final period of Meḥmed II’s life from May 1480 onwards, see Franz Babinger, Mehmed the Conqueror and his Time (Princeton, N.J.: Princeton University Press, 1978)
to an actual, historical fact or are used as a mere rhetorical device. Extant archival documents, most of which survived from seventeenth and eighteenth centuries, clearly evince the former, as court munajjims were routinely asked to compute astrologically auspicious moments for a wide variety of matters, such as setting out on a military campaign, launching a newly constructed galleon, organizing a banquet, or even manufacturing a talismanic shirt. Despite the fact that there were certain Ottoman sultans who were uneasy with the idea of heeding astrologers’ advice, the ruling authorities often duly noted the temporal instructions of the court munajjims. In certain cases, when the initial recommendation of munajjims could not be implemented due to unavoidable delays, they might have even been asked to calculate an alternative auspicious hour. For example, in a brief memo written in the year 1788, the office of court astrologers was asked to designate an alternative hour to set out on the military campaign towards Bulgaria after the first proposed time was missed. Upon this request the office calculated a second hour and delivered it to the grand vizier.

These surviving archival documents, through which the court munajjims reported the result of their calculations to the court for the requested imperial matter, were usually written in the form of brief memos. Unfortunately, prior to the late seventeenth-century there is no such surviving archival document. There is, however, one extant report in a manuscript form,

21 See for instance BOA C. SM 37/1873, BOA AE SMST III 50/3625.
22 As a counter example, one may consider Sultan Abdulaziz. See: Aydüz,
23 BOA Hat 14/576: “ordū-yi hūmāyūnuḥ...Rusçuk’ta şahrāya ḥūrūcū zimmında bir vakt-i mūbārek ihtiyārını ḥāvi müneccim-i evvel ve şānī efendiler dā ‘ileriniṅ iki kiṭ’ a ihtiyār pūsūlālār ordū-yi hūmāyūna mūtekaddimen gönderilmiş idi. Lakin ihtiyār olunan vaktlerden iļerüce bir vakt-i sa’d ihtiyār olunmak ḥuşūsu sa’d-ı ʿażam kulları ṭarafından tahrīr olunduğunā bināen mūmāileyhumā dā ʿilerinden tekrār birer ihtiyār pūsūlāsī getürdüllūb ma’rūzu ’atebe-yi ʿulyālārī kilmişdī.”
24 See for instance BOA C. SM 37/1873, BOA AE SMST III 50/3625.
produced in the mid-sixteenth century and now located at the “Yazma Bağışlar” collection of the Süleymaniye manuscript library. Surprisingly, the text is not mentioned in the comprehensive bio-bibliographical catalogue of the Ottoman astral lore published in 2011. Nor is there any reference in modern studies to the text or its author, albeit he was a decent poet in the eyes of his contemporaries.

The report is written on the occasion of the construction of the Süleymaniye mosque complex and its author ʿAlī (d. later than 1550), who uses the epithet Riyāżī, says explicitly in his introductory lines that he composed this treatise upon hearing that Süleymān the Lawgiver requested from the munajjims to designate an auspicious moment to lay out the foundation of the mosque he was planning to construct. In nine short chapters Riyāżī delivers the auspicious hour that he has calculated, explicates in detail the scientific reasoning behind his temporal election, and communicates his predictions regarding the fortunes of the complex.

As a unique document —unique in the sense of its existence and scope, not in terms of the practice itself— the text neatly illustrates how munajjims put astrology in practice for both scientifically ratifying the grand ideological claims of their patron rulers and promoting their own personal professional interests. Given the fact that the date Riyāżī suggests for the commencement of the construction perfectly accords with the date recorded in the surviving inscription of the Süleymaniye mosque as well as in other contemporary historical narratives, the document stands as yet another concrete example of the political and practical recognition

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astrological advice received at the time. There is of course the slight possibility that the treatise was composed when the construction had already started, yet I should also underline the fact that the contents of the text do not contain any anachronistic element. In addition to showing the political recognition of the service of the munajjims, the document as a foundation horoscope of a Friday mosque also gives us another opportunity to question some of the established convictions in the modern scholarship that has long assumed a definitive clash between astrological practice and religious orthodoxy. Last but not least, the vocabulary and metaphors used throughout the text present new evidence on the lofty political and cultural meanings ascribed at the time to the Süleymaniye complex by the sultan and contemporary ruling elites.

Unlike the already mentioned archival documents from later centuries preserved in shorter than one-page memos, the report in question is in a standard book format, consisting of thirteen folios written in small clear naskh script, with diacritical marks and without a title. The verse markers and section headings are in red ink, and titulature used for Süleymān in gold. The manuscript is bound in brown leather and its center is embossed with a circular medallion (shamsa). Both the medallion and decorative lines in the corners are also stamped in gold. Given the physical qualities of its cover, folios, and script, the surviving manuscript seems to be the presentation copy.

According to the colophon of the text, the work is written by a certain ʿAlī, better known with his pseudonym Riyāžī.26 This pseudonym is not an accidental choice for an epithet, as Riyāżī is an appellation literally corresponding to what the term mathematicus signifies in the Renaissance context for those who were learned in the mathematical sciences (i.e. al-ʿulūm al-

26 SK Yazma Bağışlar Ms. 4034, 13b: “Qad ițțala ʿa kawākīb hadihi ʿl-ahkām min falak al-ḍamīr wa ufq al-aqlām, afqar ʾibādullāh ar-raḏī, ʿAlī al-nisāba al-Riyāżī.”
riyādiyya) of geometry (handasa), arithmetic (ʿadad), astral lore (hayʿa and nujūm), and music (mūsīqī). As such, the adoption of this epithet certainly displays the self-confidence of our protagonist in his knowledge of the mathematical sciences, which, as we have already examined in the first two chapters, constituted the prerequisite skills and knowledge for the accurate practice of learned astrology.

Riyāḍī’s expertise, however, seems much more extensive than a standard coverage of mathematical sciences. As already mentioned in the third chapter, he features in contemporary biographical dictionaries as a polymath, equally adept in casting talismans and magic squares (ṭilsim u nīrencāt ve vefk), geomancy (reml), celestial magic (teneccūm ve daʾvet), philosophy (ḥikmet), logic (manṭık), theology (kelām), and chronology (tevārīh-i eyyām). As a son of a devşirme, he completed his standard madrasa education likely in the 1520s before he put himself in the early 1530s a master-apprenticeship configuration under the supervision of a certain Lütfullāh, who was one of the court munajjims at the time. Around this time Riyāḍī began to frequent the circles of such powerful bureaucrats as ʿĀrā ʿAbd al-Ṣāliḥ (d. 1537-8) and the chief treasurer Įskender Çelebi (d. 1535), but we unfortunately lack any additional detail about his presence in the social environment of these wealthy residents of the blossoming capital.

27 Darrell Rutkin!
29 Very little is known about Lütfullāh, who is usually confounded in the current literature with Mollā Lütfī (d. 1495), an executed Ottoman ʿālim upon allegations of heresy. The confusion results from misinterpreting an imperial order written in 1578 in which the chief judge of Istanbul was asked to procure for the newly constructed Istanbul observatory the relevant astrological-astronomical books of “the late Lütfullāh.” Both Adnan Advan and Cevad İzgi, two prominent names in Ottoman history of science, identify “the late Lütfullāh” as Mollā Lütfī without any substantial reason. However “the late Lütfullāh” mentioned in this imperial order was one of the court munajjims during the first half of the reign of Süleymān as clearly documented by archival register of payments at the time and his own copy of the horoscope, housed now in Kandilli Rasathanesi Library.
Although it is difficult to fully ascertain the date he started to work as a court *munajjim*, the earliest reference I was able to find about him in the scattered archival documents dates only back to 1548-9, a year before the construction of the Süleymaniye mosque started.

In terms of professional matters, the period preceding immediately the construction of the Süleymaniye mosque must be quite disquieting for Riyāżī. As I already demonstrated in the third chapter, in contrast to the pay levels of any other comparable palace personnel, the salary Riyāżī received at the time was significantly lower. Moreover, he might have been uneasy with his colleague Yūsuf b. ʿÖmer’s enjoying a more prestigious status than that of him, for in one of his verses that ʿĀşık Çelebi quotes, Riyāżī implies in a sarcastic tone the worthlessness of Yūsuf by identifying him as the ass of a body while casting himself as its head.

This possible resentment of him partially explains why Riyāżī decided in the first place to write a relatively long and detailed horoscope with sporadic insertions of personal remarks, instead of merely delivering in a short memo the date he would have advised to start the construction of the mosque. He must have used the sultan’s initial request for the planned construction as an opportunity to impart and persuade the court that by virtue of his unmatched expertise in the required mathematical sciences he was superior to all the other contemporary *munajjims*.

Compared to the brevity of astrological memos later court *munajjims* wrote to designate an auspicious moment for similar occasions, Riyāżī’s text is written in a codex form, containing elaborate explanations for his astrological reasoning and occasional insertions of his original verses, echoing his embittered voice. In the beginning of the text, for instance, he inserts one of his verses that highlight his uneasiness about his adverse fortunes while other inept individuals
receive more favors. In fact the entire horoscope is an explicit call to the sultan to reassess and appreciate his scholarly caliber. In the epilogue section of his treatise, Riyāżī maintains that many calamitous incidents have recently happened in his life, and several unbearable obstacles and adversities have hampered him living a blessed life. In a self-aggrandizing manner, Riyāżī refers here to his own intellectual merits and does not shy away from expressing his discomfort about the lack of meritocracy at his time:

“How strange it is that Riyāżī has no property in this world, While he is equally well-versed in each of twenty four sciences.”

Riyāżī opens his treatise with a brief deliberation of the reasons of its composition. Accordingly, Süleymān, whom he glories as “the sultan of the Two Holy cities”, “the caliph of the two mosques”, “the destroyer of the idols and the houses of unbelief”, “the founder of the pavilion of the pure sharia and builder of the private columns of religion” demanded an auspicious hour to lay foundation of a Friday mosque which eventually became the Süleymaniye Mosque that still stands as one of the most significant landmarks of Istanbul. The mosque, for Riyāżī, will be placed on a high ground, resembling “the Iram of the lofty pillars the likes of which had never been created in the land.” (Q39: 6-7)

Ensuing this royal request, according to the narrative, Riyāżī made necessary calculations to determine the most auspicious hour to start the construction of the mosque. His wording here does not specify the type of instruments he used—whether a zij or an astrolabe—to make these

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30 Riyāżī, 13b: “Yigirmi dört fünunun her birinde Riyāżī yekfen olmuşken 'acebdür! Ne mali var ne esbaı cihanda, faţilet zillete verse sebebdür”

31 Riyāżī, 1b-2a: “Suţānū'l-ḥaremeyn...ḥalifetū'l-mescideyn...hādim-i büyūti 'l-küfr ve 'l-āsnām, bānī-i kaşr el-šer 'el-mūbīn...mü'essis-i erkân-i makşūreti 'l-dín.”
celestial calculations. He simply says that after diligently analyzing the planetary aspects and detecting the relative positions of the celestial objects according to the latitude of Istanbul, he designated a propitious hour, auspiciousness of which was acknowledged by contemporary astrologers and taqwīm-makers. Accordingly, the foundation should be laid ground four hours and 12 minutes after sunrise on Thursday, 26 Jumādā I, 957/June 12, 1550 when the ascendant would be in the twentieth degree of the sign Leo. Upon designating the exact date and time for his election, Riyāżī then places the chart for the horoscope of the designated moment. Unlike the prose section in which he established the ascendant in the twentieth degree of Leo, in the horoscope chart the ascendant is denoted as the twenty-second degree of Leo, a fact he would later explain in the text. Upon establishing the horoscope chart that denotes the celestial configuration of the astrologically important variables on the day, he starts elaborating the scientific foundations of his election and elucidates in nine short chapters the astronomical and astrological matters relevant to this choice.

In the first chapter Riyāżī explains the reasons for taking the sign Leo as the base for his calculation. He refers heavily to Abū al-Maḥāmid al-Ghaznavī’s (d. later than 1154) relatively popular treatise Kīfāyat al-taʿlīm fī ṣināʿat al-tanjīm, which introduces the students of the science

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32 During my research in Süleymaniye manuscript library I found two manuscripts, specifically two astronomical tables, bearing Riyāżī’s possession notes. The first one is a commentary of Ilkhanid tables composed by Niẓām al-Dīn Nishābūrī (d. 1328/9) and the second one is Mīrīm Çelebi’s (d. 1525) commentary on the Ulugh Beg tables. It is difficult to gauge which table Riyāżī was consulting for his calculations but as an erudite munajjim of his time, he was certainly knowledgeable about both the Maragha and Samarqand tradition.

33 Riyāżī, 2a: “Tecessüs-i ittişālāt-i ʿasumānī ve tefferrūs-i enzār-i ecrām-i nūrānī idüb ʾetbāq-i durūc-i semovānü ve evrāq-i burūc ve derecāti ḥarfen be-ḥarfen ve maẓrūfen ve żarfen tetebbu’ olnudqada bir sāʾat-i mesʿūde ve vaqt-i maḥmūde ihtiyār olnudi ki…”

34 Ibid.: “sene sebʿa ve ḥamṣīn ve tisʿ a miʾe Cemāʾe’l-ʿulāsını yiğirmi altinci gün pençenbih gününde tūlūʾ-ı Şemsden dört săʾat ve on iki dakika mürūr itidide ki ufık-ı dārūʾl-mülk ʿKoştanṭiňiyeye…’de Esed burcu ufukda vākiʾ ve yiğirmenci derecesi taliʾ olur.”
of the stars the movements and characteristics of celestial objects and imparts them the methods for different forms of astrological practice. With reference to Ghaznavī, Riyāżī says that when a royal enterprise is in question the astrologer should take into account the royal sign (i.e. Leo) as well as the two luminaries (the Sun and the Moon) and the two remotest planets (the Saturn and Jupiter). The signs ruled by Saturn —the Capricorn and Aquarius respectively— are not appropriate to choose for this specific enterprise, because the first one is a tropical sign, not propitious for matters related to construction, and the second one is an inauspicious sign. In a similar vein the signs ruled by Jupiter are also not relevant for construction business. Moreover, as Riyāżī says, during that particular season the ascendants of these two signs would take effect in nighttime, which thus renders them invalid as an option to start the construction. The Cancer, another tropical sign ruled by the Moon, is also not suitable for this kind of election. Therefore, the only available option is Leo, which is a fixed and royal sign appropriate for imperial construction. As Riyāżī maintains, other authorities, including Kūshyār, are also in full agreement about the validity of Leo in designating an auspicious moment for a royal construction activity.

In yet another reference to Ghaznavī, Riyāżī says in the remaining part of the first chapter that the nativity of the querent (i.e. the Sultan in this instance) is equally important for accurately electing the auspicious moment, for it should be in harmony with the horoscope of the designated

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hour. Like many other practicing munajjims of the time would think, says Riyāżī, each person is born under different astrological conditions. Therefore the most auspicious time to hold an event should be different for different individuals. Here he makes a medical analogy by saying that irrespective of its potential benefits; a medicine would inevitably fail if it does not conform to the bodily constitution (mizāc) of the particular person. In a similar vein, the selection of an auspicious moment would not turn out good unless it complies with the natal horoscope of the querent. Riyāżī does not give in full detail here the nativity of Süleymān, except implying that the fourth, sixth, seventh (the descendant), and the twelfth houses on his nativity were malefic.

In the second chapter Riyāżī explains the reasons why he found it important to rectify the degree of the ascendant and set it as the 22\textsuperscript{nd} degree of Leo as opposed to the consensus of contemporary astrologers on the 20\textsuperscript{th} degree of the same sign. Unlike other astrologers who tend (or whom Riyāżī thinks tending) to believe that each degree of astrological signs produce more or less the same effects, Riyāżī emphasizes the important nuances resulted from the

\[\text{References:}\]


\[40\] As Riyāżī’s discussion in this text reveals, the birth and accession horoscopes of Süleymān must have been in circulation at the time. However, to date, I have not been able to locate any of them in any of the manuscript libraries I conducted research, not I have come across any such references in a contemporary narrative source.

\[41\] Riyāżī, 4a: “Cümhûr-ı aşhab-ı tencîm ve cümle-i erbâb-ı takvîm ittifâk ve tedbîr ve ta’yin itdikleri dereceyi tagyîr ve derece-i uhraya te ûhir itmesinin beyanındadur: Cümle-i münecçimîn ve.cumhûr-ı mukavvimîn ittifâk itdiler ki tâli-ı mübarek Esed burcunûn yigirmînci derecesi ola ammû derece-i mezkûreyi ihtiyâr kaşda mukäreenet ve bu huşûsa ziyûde münâsebette değildir. Belki bir ittifâk idî ki ittifâkî vâki’ ve bir tercîh idî ki bilâ-müreccaß şâyi’ oldî.”

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differences in the individual degrees of the sign. As he states, just as the different zodiacal signs have varying terrestrial influences, different degrees of a particular sign also leads to diverging outcomes, and thus should be interpreted accordingly.\textsuperscript{42} This rule is, according to Riyāżī, already established in the treatises transmitting Babylonian secrets and in some of those books written by Muslim philosophers.\textsuperscript{43} Riyāżī says that after he consulted several books of earlier authorities, particularly the teachings of Teucros, who was known in the Islamic world under the name Tangalūshā, he decided to rectify the ascendant into the 22\textsuperscript{nd} degree of Leo, because this degree signifies piety and sound belief.\textsuperscript{44} By directly quoting a passage in Arabic attributed to Tangalūshā, Riyāżī maintains that if the 20\textsuperscript{th} degree of Leo is to be selected, then the portents would not be promising because not only that the 20\textsuperscript{th} degree is a malefic one, but also the corresponding fixed star is an ominous one, a fact other contemporary munajjims simply passed over. If the foundation of the mosque is laid ground when the ascendant is in the 20\textsuperscript{th} degree of

\textsuperscript{42}Riyāżī, 4b: “Burucuən aʃarı mütefəvit ve aḥkamı ‘alə sebili ‘t-tagayyur šabib oldıgı gibi derecät daḥu mütefəviti tı’-aʃər ve mütebəyineteti ‘l-aḥkəmdar.”

\textsuperscript{43}Ibid: “Suver-i derecətə müstəmil ve rumüz-i Keldəniyyine şamil olan resāilde məhərrər ve fələşifə-i İsləmdən bə zınım daḥ pətəblərinə musətərdür.”

\textsuperscript{44}Ibid., 4b-5a: “Pes faəkər bu huşusda ziyəde diikət ve kütüb-i mezkəreye mürəcca’at idəb Esedüən yigirminci derecesin tagyır ve yigirmi ikinci derecesin tahvrır...itdirdüm...Hekim-i pişvə Təngəlişə suver-i derecət şərəh itdigi kitəbdə bu derece şərəhinə eydür: ‘yaṭla ‘u fiḥa aḥad al-maləika al- uzmə ma ‘ahə zaməra yazmiru bihə lə yasma ‘ahu aḥad al-əţrab şəraban shadıdan man wulida bihə yakın ‘əbidan zəhidan bi-takallüm al-ḥikma wa yatəlu ‘umruhu hadihi daraja mubəraka’”

The text attributed to Tangalūshā was translated into Persian earlier than twelfth century but apparently Riyāżī had access to an Arabic version of it. Fakhr al-Dīn Rāzī’s book on celestial magic, al-Şirr al-maktūm, was also informed by the teachings of Tangalūshā. It is likely that Riyāżī learned the teachings of Tangalūshā through Rāzī’s work. For the modern Persian edition of the text, see: Tanklūsha, az mu’allif-i nāshinākhtah, ed. Raḥim Rızā Zādah Malik (Tehran: Mīrās-i Maktūb, 1384/2005). For Tangalūshā, see also: Živa Vesel, “Teucros in Nizami’s Haft Paykar,” in A Key to the Treasure of the Hakim: Artistic and Humanistic Aspects of Nizami Ganjavi’s Khamsa, ed. by Johann-Christoph Bürgel & Christine van Ruymbeke. Leiden: University Press, 2011, 245-252.
Leo, then majority of people would hesitate to frequent, and even dislike the mosque. Thereby the building would not receive the attention of pious residents.\footnote{Riyāżī, 5a: “eğer bu derecede vâki’ olaydı nüfûs-i ‘âmminîn câmi’-i mezkûra ‘adem-i teveccühleri mukarrer belki nefretleri mukadder olub erbâb-i zühd ve şalâh ve aşhâb-i ’iffet ve felâh çendân müteşevvîk ve ıltîfâtları müte’allîk olmazdı.”}

Riyāżī’s elaboration in this second chapter is important for a number of reasons. First of all, his alleged disagreement with contemporary munajjims as to the importance of the particular degree of the ascendant hints at the intellectual competition among practicing astrologers, who might have resorted to the teachings of different authorities and reached varying, and at times conflicting, interpretations. Through the end of this chapter, Riyāżī claims in a self-promoting manner that his explanations about the intricacies of the degree of the ascendant convinced his contemporaries to revise their initial position, and they thus came to acknowledge his scientific superiority more than ever.\footnote{Riyāżī, 5b: “ve bu me’ânî-i bedî ıay beyân itidiğde cümlesi bi’il-ıttifâk semi’nen ve aṭa’nen diyûb teslim ve mûnkâd ve müstaḥrîcîn fazîletine evvelden daḫî ziyâde i’tirâf ve i’tikâd itdiler.”}

Besides this scholarly rivalry among practicing munajjims, Riyāżī’s concerns about the number of individuals that would frequent the mosque perfectly resonate the redefined and sharpened Sunni awareness among contemporary Ottoman political elites at the time. This period overlapping with the second half of Süleymān’s reign witnessed a gradual shift from the earlier universalist ambitions on the political and religious spheres to a “more sober and orderly representation” of the empire.\footnote{Cornell H. Fleischer, “Shadows of Shadows: Prophecy in Politics in 1530s Istanbul,” \textit{International Journal of Turkish Studies}, 13/1-2 (2007), 61. For the importance of contrasting the diverse political and cultural realities of the second half of Süleymān’s long reign with those in the first half, see: Fleischer, “The Lawgiver as Messiah: The Making of the Imperial Image in the Reign of Suleyman,” in \textit{Soliman le magnifique et son temps}, ed. Gilles Veinstein (Paris: La Documentation Française, 1992), 159-177; Gülru Necipoğlu, “A Kanun for the State, A Canon
introduced to implement state-sponsored confessional policies, promoting the Ottoman House as the ultimate protector of Sunni Islam against the heretical Safavids, European Christians, and recalcitrant Sufis with millenarian ideas. Through heresy trials, unruly dervish leaders were executed and others tamed.  

Through the fatwas of Sheikulislam Ebüüssu'ūd Efendi and the other legal writings of leading religious scholars, the irreligious character of the Safavid cause was constantly lamented. New congregational mosques were constructed in almost every neighborhood of the city and mosque worship was particularly promoted through new fines for irregular attendance. Therefore Riyāżī’s explicit remarks on the importance of the quantitative aspect of mosque worshipping should be evaluated within this particular context of the political enforcement at the time of Sunni orthodoxy. In fact, the whole idea behind the construction of the Süleymaniye mosque was, as Gülru Necipoğlu has aptly remarked, to promote “the policy of religious orthodoxy enforced by a caliph-sultan seeking to legitimate his power as being in the service of the Sharia’s straight path.”

In the third and fourth chapters of this text, Riyāżī treats other celestial conditions and planetary positions that corroborate the auspiciousness of the designated moment, as they sign good fortune for the future course of the mosque. The first condition is related to the position of

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48 For the standard account of the history of these heresy trials, see: Ahmet Yaşar Ocak, *Osmanlı Toplumunda Zındıklar ve Mülhidler 15.-17. Yüzyıllar* (İstanbul: Tarih Vakfı, 1998), esp. 236-382.


the Moon and Riyāżī associates its astrological significance with the potential monumentality of the intended mosque complex. For Riyāżī, the elevated ceiling of this noble construction will be like the tenth celestial sphere, and the designed courtyard will look like the ninth degree of paradise. The second astrological condition is linked to the station of Venus vis-à-vis the house upon which Moon exerts the utmost influence. According to Riyāżī this sign is a benefic one, also related, among other things, to the popularity of the mosque worshippers, as it signifies that the mosque would be the favorite of all people from diverse regions.

Third astrological condition mentioned here refers to the firmness of the mosque’s architectural qualities. When interpreting the fourth astrological condition, Riyāżī contrasts the yet-to-be-built Süleymaniye mosque to the al-Aqsa mosque, and more importantly to the al-Bayt al-ma’mūr, ‘the Flourishing House’, which according to most Quran commentators is the heavenly counterpart of the Ka’ba. For Riyāżī, the portents are obvious that the Süleymaniye mosque will be as refined as these two holy structures. Moreover the same portents also indicate that like Arafat, the Süleymaniye mosque will be brimful with pious and discerning people, and like Ka’ba, men of the unseen realm (rijāl al-ghayb) will be ever-present there.

As to the interpretation of the fifth astrological condition, Riyāżī says that those who will perform their prayers in the Süleymaniye mosque will be prosperous and thriving. The interpretations of the

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51 Riyāżī, 6a: “delālet ider ki bu binā-yi şerīfīn sakf-i merfū’i sipihr-i ʿaṣir ve şaḥn-ı maşnū’ı behišt-i tāsi’ olub kıbābınıň kuʿūdı ahṣen-i vūcūh üzere meşdūd ve müşeyyed ve minārerleriniň kıyāmını elif gibi memdūd ve müshedded ola.”


remaining conditions in this chapter and the next one are slanted rather towards expressing the beauty of the façade of the mosque, the exquisiteness of its view, and the divine protection it will enjoy against any sort of misfortune and affliction.

The fifth and sixth chapters of the treatise are devoted to a discussion on the importance of the harmony between four horoscopes: the horoscope of the Süleymaniye complex, the nativity of Süleyman, the horoscope of his accession to the throne, and the horoscope of the year-transfer of the most recent year (i.e. the year 957). For Riyāżī, all of these horoscopes are in compliance with each other, though he does not tabulate and verbally detail the remaining three. As Riyāżī emphasizes, such a harmony is indeed a rare instance, further signifying that the Süleymaniye mosque —he likens it one more time to the legendary Iram of the lofty pillars and Ka‘ba— will be strong, enduring, and immortal.⁵⁴

In the seventh chapter Riyāżī points to some of the inauspicious signs in the designated horoscope that could still be deployed for bringing auspicious consequences. Here he makes another medical analogy and states with an explicit reference to (ps.) Ptolemy’s Kitāb al-Thamara that an erudite munajjim has to know how to balance the inauspicious portents just as a learned physician should know how much poisonous substances to put in one’s medication.⁵⁵

The eight chapter is consecrated to the elaboration of the fortunes of the architect of the complex. Riyāżī says, without mentioning the name of Sinān (d. 1588), that the celestial

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⁵⁴ Some of the phrases he uses in these chapters to emphasize the rarity of this situation are: ittifāḳ-ı nādiredendür; muvafaḳat-ı garḥbedür; böyle düşmek be-ga'yet nādirdür; garib ittifāḳdūr; ʿaceb muvafaḳat-ı tāli' dūr.
⁵⁵ Ibid., 10a: “ḥükemā-yı ʿilm-i nüjūm nühişi daḫı mahallinde istihdām ve anları baʾzı ṭarikiyle dāḫil-i ahkām iderler ṭabīb-i hāziḳ ve hekim-i faik sumūmadan baʾzın mīkdār-ı Muʿayyen birle meʾâciñe mahlūṭ ve tiryāḳātına merbūt itdigi gibi nitekim üstād-ı şana at ve pişvā-yı ehl-i heyʾat cāsūs-ı felek Baṭlamyus Şemere adlı kitābinin kelime-i şānī ῥāsiyerseninde eydūr.”
configuration of the designated moment is a clear sign of the uniqueness of his acumen and originality of his architectural plan. In the ninth and the last chapter, he tries to establish — on astrological terms — the possible end date of the construction. Riyāżī reaches two conclusions on the basis of his calculations as to the relative position of the Mars. According to the first conclusion, the construction would last 5 years 3 months and 23 days. According to the second one, it would last 4 years and 9 months. The discrepancy between the two derives, as Riyāżī maintains, from the fact that the first calculation takes as the starting point the moment foundations are to be dug, the second however only takes into account the actual start date of the construction activity. Yet as he explicitly says, all of these (astrological) indications and calculations are mere approximations and it is his hope that the construction of the complex will be finished within five years. Considering the fact that the actual construction process lasted for more than seven lunar years, this last chapter is a clear proof that the treatise was composed long before the completion of the mosque.

In all his remarks throughout the horoscope, Riyāżī mirrors the grand cultural, religious, and architectural meanings ascribed contemporaneously to the construction of the Süleymaniye mosque. The relatively long construction process of the Süleymaniye complex (1550-1557) is well documented thanks to the ample literature on this cultural landscape. For example Ömer Lütfi Barkan published in two large volumes the detailed registers that list the type and amount

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57 Riyāżī, 12b: “Pes delîl-i şānī beş yul üç ay yigîrmi üç günü delālet ider ve delîl-i evvel dört yul ve jokūz aya işaret ider. Ammā cāz ki birisi iubitdâ-i esâdan intihāya şehâdet ve birisi evvel-i mîbâsereden intihāya beşâret ide ammâ bu delîler takrîbîdîr ve ‘l-hâṣil beş yula dek insâ allâh el-melik el-‘allâm intihā ve itmâm bulur.”
of materials used, as well as the names, duties, and wages of workers employed in the construction. The architectonics of the Süleymaniye mosque has also received the attention of scholars, particularly the professional architects, who have focused on the material features of the building. Beyond these statistical and structural studies, Gülru Necipoğlu has revealed the political and cultural symbolism embedded in every aspect and detail of the construction of the Süleymaniye complex, from chief jurist Ebûssuʿûd’s (d. 1574) placing the cornerstone of the mihrab in the foundation ceremony and the titles used for Süleymân in the inscription to the columns and marbles brought from the ruined Temple of Jupiter in Baalbek to Istanbul. Gülru Necipoğlu particularly emphasizes the cultural myths, cosmological references, and religio-political symbolism underlying the construction of the complex, and further argues that Süleymaniye was Süleymân’s ultimate ideological testimony. In that regard, the foundation horoscope of the complex, and constant references of Riyâzî to the paradise or Kaʾba, provide an invaluable contemporary testimony complementing what earlier scholarship has outlined as to the political and cultural significance of the construction of the Süleymaniye Complex.

As to the date for the beginning of the construction, we have available a number of contemporary sources allowing us to make a comparison with the designated hour at the foundation horoscope, which was four hours and 12 minutes after sunrise on Thursday, 26 Jumādā I, 957/June 12, 1550. The most important of all these sources is the inscription that still

stands over the mosque’s portal. The inscription, which was composed by the chief jurist Ebûssu'ûd and inscribed by the calligrapher Hasan Çelebi, a student of famous calligrapher Aḥmed Karaḥisārī (d. 1555-6), clearly reads that the construction began in the last few days of the Jumādā I 957 (al-biḍāya fī awākhir Jumādāʾ-l-ūlā li-sana sabʿa wa khamsīn wa tisʿa-miʿa).61

In the semi-autobiographical memoirs of the Ottoman chief architect Sinān, the starting date of the construction is also set as Jumādāʾ-l-ūlā of the year 957 (ca. June 1550), but unfortunately no specific day is mentioned. These information is further corroborated by the remarks of the empire’s chief bureaucrat Celâlzâde Muṣṭafā (d. 1567), who not only witnessed the construction of the complex but also attached it a great importance in his chronicle by reserving a separate lengthy chapter to introduce it as the “most articulate cultural statement of Ottoman imperial Sunnism.”62

According to Celâlzâde, after the site for construction was determined and the foundations dug, the astrologers (mehere-i erbāb-i takvīm ve nücūm) designated an auspicious hour and the foundation was laid accordingly on Thursday 27 Jumādā I 957.63

When the information gleaned from these three key contemporary testimonies is juxtaposed side by side with the date suggested in Riṣāzī’s horoscope and the one presumably advised by

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62 Şahin, 187.

Modern conversion tables (see: http://193.255.138.2/takvim.asp) establish 27 JA 957 not as Thursday, as Celâlzâde says, but rather as Friday. When converting dates from Hijri to Gregorian calendar, it is considered much more important to see whether corresponding days of the week fully overlap. Since both calculations give Thursday as the day during which construction started, we can simply disregard this one-day deficit and conclusively establish that the construction started on Thursday of the last week of Jumādāʾ-l-ūlā.
other munajjims, it becomes crystal clear that the imperial authority duly followed the ruling of astrologers. As regards to the question whether the imperial authority adopted Riyāzī’s adjusted recommendation or that of other munajjims, who allegedly recommended the time when the Ascendant was in the 20th degree of Leo, it is not possible to give a definitive answer, as these two different computations in fact differ by only eight minutes in terms of their temporal equivalents. Hence they must have corresponded the exact same day. This, however, makes it impossible for us to ascertain — on the basis of the evidence gleaned from contemporary sources — which recommended hour was taken into consideration. But the only thing that is clear is that despite the declining interest at the time in the cultivation of astrology and patronage of astral experts, the astrological advise of the munajjims was still taken into consideration for symbolically important events as the construction of an imperial mosque.

64 In the concerning calculations, the astrological rules entail that at the rate of one degree, the ecliptic moves (in relation to the Earth) every four minutes. See: Elwell-Sutton (ed.), The Horoscope of Asadullāh Mirzā: A Specimen of Nineteenth-Century Persian Astrology, 58.
Conclusion

This dissertation was set out to explore the astrological texts produced and circulated in the Ottoman realm, particularly at the Ottoman court, from the mid-fifteenth to the mid-sixteenth century. The initial research question was to examine whether the messianic and millenarian discourse proliferating at the time from “Tagus to the Ganges”, which often had recourse to the occult scientific principles as rhetorical devices, did permeate into the contemporary astrological corpus. The rich body of Ottoman astrological materials surviving from the period seemed as a promising source pool. This corpus consists primarily of almanac-prognostications (taqwīms) produced on a yearly basis, annotated horoscopes cast on specific occasions, and all sorts of astrological textbooks and astronomical tables (zīj) utilized by munajjims when practicing their craft. While these sources have provided surprisingly little evidence as to the advancement of messianic and millenarian claims, their sophisticated scientific underpinnings as well as their ability to resonate the immediate political, cultural, and patronage dynamics of their times make them valuable sources for historical purposes. It is, thus, the primary argument of this dissertation that exploring the hitherto neglected Ottoman astrological materials and visiting the lives of hitherto marginalized Ottoman astral experts (munajjims) can provide fresh insights into the intersecting layers of politics, culture, and knowledge production in the early modern Ottoman world.

The general conclusions that I have drawn after examining my research materials are summarized in the Introduction, therefore I would like to use this section as an opportunity to raise several issues that my dissertation has either scarcely covered or entirely left out of immediate discussion. I believe such a discussion will also be fruitful to address a number of
directions for future research.

The focus throughout this study has been upon the production of what the historians of science would call “learned” or “mathematical” astrology in the courtly setting. In this kind of astrological practice, the students and the patrons alike needed to be eager enough to undertake complex mathematical and astronomical computations for accurately determining celestial positions. Although the majority of the historians of scientific production in the Islamicate context still hesitates to acknowledge the inherent astrological concerns in the advancement of observational techniques and mathematical sophistication, the highly technical and “scientific” sources as zijes are rather candid about it. This does not mean, however, that practitioners of this “learned astrology” were blasphemous astral determinists or wonder-workers with occult powers. Quite to the contrary, many of those practitioners in the field of learned astrology were alert about the limits of their craft, either on scientific or religious grounds, or sometimes even both. In that regard, the constant attacks directed against the astrologers and the charges, such as astral determinism, heresy, and disbelief do not necessarily apply for them.

Needless to say, this “learned” and/or “mathematical” astrology was but one form of astrological practice. There were other and mathematically less informed, if not altogether folk, versions of astrological praxis that also counted on the indisputable belief in astral causality with further affinity toward practicing magic. While it would be quite difficult, and historically inaccurate indeed, to strictly separate these two types of mindset from one another, I should say that the materials I have examined for this project fall rather into the first category than the other. There is, thus, a certain need to treat the less-technical production of astrological knowledge and its circulation in the Ottoman world on a wider social, geographical, and temporal scale.

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One should, however, take into consideration the availability, quality, and variety of sources before undertaking any historical study. One important reason for focusing rather on the astrological materials produced in the courtly setting was the more systematic nature of these sources. Unlike scattered and fragmented textual artifacts circulated among more popular circles, the technical astrological writings, which were regularly composed for the consumption of the court, substantially alleviated the problem of documentation. It should be noted here that historians working on the practice and politics of astrology are already in a disadvantageous position because in many cases the exact service and presence of astrologers cannot be fully captured and reconstructed due mostly to the oral nature of astrological counseling. The high number of astrological textbooks in circulation, or the frequency of references in contemporary narrative sources to the anonymous astrologers does not always solve this conundrum of “documenting the undocumented.”

In terms of the temporal scope, although 1450s and 1550s have demarcated the chronological boundaries of this dissertation, this does not mean that astrological pursuits played no role afterwards in the Ottoman political, cultural, and intellectual spheres. In fact this scope could and should be extended toward the reign of Murād III (r. 1574-1595), whose turn is crucial for the cultivation of celestial knowledge through the establishment in the capital of the short-lived observatory. The relevant literature on the observatory rather focuses on the infamous episode of its destruction upon the fatwa of the shaikhulislam of the time, but the real scope and contents of the astral pursuits undertaken in the short-lived observatory of Taqī al-dīn and his collaborators still deserve a better and fair scholarly treatment.

Another important aspect that my dissertation has not properly addressed is the
penetration of astrological concepts and beliefs into courtly ceremonies and contemporary artistic and visual production. The studies in especially the early modern Mughal historiography have substantially demonstrated the importance accorded to the astrological teachings for the organization of the courtly order. In a similar vein, Mughal paintings have been mined for the powerful astrological symbolism and presence of astral experts therein. One can also add to this list the need for exploring architectural structures for tracking the traces of astrological influences.

As it is clear from this brief discussion and the longer treatment throughout the dissertation, exploring the influences and textual/visual sources of astrological practice/mindset in the late medieval and early modern Ottoman content can provide many fresh insights into the inextricable spheres of intellectual, political, cultural, and personal life in the early modern Ottoman world. The rich manuscript, archival, and visual sources descended from diverse periods and locations could easily be studied across different historiographical and chronological coordinates. Through such a theme-base study, it is even possible to rehabilitate the rigid compartmentalization in the modern Ottoman studies.
Appendix A: The list of astral experts at Bāyezīd II’s court, 1503-1512.

<table>
<thead>
<tr>
<th>Name</th>
<th>Status</th>
<th>Total # Occasions for receiving allowances</th>
<th># of allowances in return for Presenting Taqwīm</th>
<th>Special Occasions</th>
<th>Active Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mevlânâ Seyyid Munajjim</td>
<td>monthly salaried palace personnel</td>
<td>≥31</td>
<td>≥8</td>
<td>1 for the loss of his son</td>
<td>1503-1512</td>
</tr>
<tr>
<td>Mevlânâ Mîrîm Çelebi</td>
<td>monthly salaried palace personnel</td>
<td>16</td>
<td>N/A</td>
<td>1 for his wedding expenses, 1 for his wife’s consumption</td>
<td>1503-1512</td>
</tr>
<tr>
<td>Sinān b. Munajjim¹</td>
<td>Monthly-salaried palace personnel</td>
<td>≥10</td>
<td>≥5</td>
<td>N/A</td>
<td>1503-1512</td>
</tr>
<tr>
<td>Yūsuf b. ʿÖmer el-Sāʿatī</td>
<td>monthly salaried palace personnel</td>
<td>≥8</td>
<td>≥3</td>
<td>1 for Hajj expenses</td>
<td>1503-1512</td>
</tr>
<tr>
<td>Ardashīr b. Malik Hasan</td>
<td>monthly salaried palace personnel</td>
<td>≥5</td>
<td>≥5</td>
<td>N/A</td>
<td>1505-1512</td>
</tr>
<tr>
<td>Salmān-i ʿAjam</td>
<td>monthly salaried palace personnel</td>
<td>≥9</td>
<td>≥8</td>
<td>N/A</td>
<td>1503-1510</td>
</tr>
<tr>
<td>Seyyid Īsmāʿil</td>
<td>son of Sayyid Munajjim</td>
<td>≥8</td>
<td>≥5</td>
<td>N/A</td>
<td>1503-1512</td>
</tr>
</tbody>
</table>

¹ While it is true that in the Ottoman textual culture the names Sinān and Yūsuf were often used interchangeably for individuals named as Sinānuddīn Yūsuf, it is more likely that these Sinān and Yūsuf b. ʿÖmer el-Sāʾatī are two different individuals, maybe even brothers as the sons of a certain ʿÖmer who is referred to in the register sometimes as muwaqqit, sometimes as muʿādhdhin, and sometimes as munajjim. For example in the relevant entries from the month of Dhū al-Ḥijja in the year 916, Sinān’s name is recorded as the one given 500 aspers on the 25th of that month for the taqwīm he presented whereas Yūsuf apparently received his customary 500 aspers on the 29th.

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<table>
<thead>
<tr>
<th>Name</th>
<th>Role</th>
<th>Duration</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>İshak munajjim</td>
<td>unspecified</td>
<td>≥8</td>
<td>N/A 1505-1512</td>
</tr>
<tr>
<td>'Ali</td>
<td>student of Mirim Çelebi</td>
<td>≥3</td>
<td>N/A 1506-1510</td>
</tr>
<tr>
<td>Murad muwaqqit</td>
<td>time-keeper at Edirne Bâyezîd Mosque Complex</td>
<td>≥2</td>
<td>N/A 1505-1506</td>
</tr>
<tr>
<td>Muhammed b. Hijr</td>
<td>sword-bearer</td>
<td>≥2</td>
<td>N/A 1505-1506</td>
</tr>
<tr>
<td>Mirza Beg</td>
<td>chief food taster of Shahzâda Ahmed</td>
<td>≥2</td>
<td>N/A 1508-1510</td>
</tr>
<tr>
<td>Mevlânâ Sinân a.k.a. Qâdî-i Baghdad</td>
<td>Instructor of religious sciences at the Sultaniya madrasa in Bursa</td>
<td>≥1</td>
<td>N/A 1507-1508</td>
</tr>
<tr>
<td>'Abd al-Rahman munajjim</td>
<td>munajjim of Shahzâda Ahmed</td>
<td>≥1</td>
<td>N/A 1509-1510</td>
</tr>
<tr>
<td>Muhammed b. Qâdî-i Úsküb</td>
<td>unspecified</td>
<td>≥1</td>
<td>N/A 1512</td>
</tr>
<tr>
<td>Muhammed b. Qâdî-i Gelibolu</td>
<td>unspecified</td>
<td>≥1</td>
<td>N/A 1512</td>
</tr>
<tr>
<td>Receb</td>
<td>student of Mâvlânâ Sayyid Munajjim</td>
<td>≥1</td>
<td>N/A 1512</td>
</tr>
<tr>
<td>Mevlânâ Şemseddîn</td>
<td>unspecified</td>
<td>≥1</td>
<td>N/A 1503-1504</td>
</tr>
<tr>
<td>Muhammed b. Kuţbuddîn</td>
<td>unspecified</td>
<td>≥1</td>
<td>N/A 1505-1506</td>
</tr>
</tbody>
</table>
Appendix B: The list of books on ʿilm al-nujūm and ʿilm al-hayʿa at the Palace library (1502-3)

Transcription of the relevant section in ʿĀṯūfīʿs catalogue
(The Library of the Hungarian Academy of Sciences, Török F59, p. 313-333)

<table>
<thead>
<tr>
<th>Kitāb al-Qānūn al-Masʿūdī fī ʿilm al-nujūm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kitāb al-Qānūn al-Masʿūdī fī ʿilm al-nujūm</td>
</tr>
<tr>
<td>Kitāb Madkhal al-Nujūm biʿl-Fārsiya fī ʿilm al-nujūm</td>
</tr>
<tr>
<td>Risāla fī Samt al-Qibla min qibal ʿilm al-nujūm</td>
</tr>
<tr>
<td>Kitāb Miṣtāḥ al-Nujūm biʿl-Fārsiya</td>
</tr>
<tr>
<td>Zīj-i Khaqānī fī Takmīl-i Zīj-i Īlkhanī fīl-nujūm</td>
</tr>
<tr>
<td>Zīj-i Ulugh Beg fīl-nujūm</td>
</tr>
<tr>
<td>Kitāb Athmār wa Ashjār fīl-nujūm fī mujalladin wāḥidin</td>
</tr>
<tr>
<td>Kitāb Zīj-i Īlkhanī fīl-nujūm</td>
</tr>
<tr>
<td>Zīj Mawdūʿ ʿalā mā șaḥḥahu al-shaykh Ābū al-Wafāʿ wa aṣḥābuhu fīl-nujūm</td>
</tr>
<tr>
<td>Zīj-i Ulugh Beg fīl-nujūm</td>
</tr>
<tr>
<td>Zīj-i Īlkhanī fīl-nujūm</td>
</tr>
<tr>
<td>Zīj-i Īlkhanī fīl-nujūm</td>
</tr>
<tr>
<td>Zīj-i Ulugh Beg fīl-nujūm</td>
</tr>
<tr>
<td>Kitāb Zīj-i Īlkhanī fīl-nujūm al-marqūm bi-annihī bi-khaṭṭ muṣannifihi al-Naṣīr Tūsī</td>
</tr>
<tr>
<td>Zīj-i mujmal li-Mawlānā Kūchak al-Amāsī fīl-nujūm</td>
</tr>
<tr>
<td>Zīj-i Ulugh Beg fīl-nujūm</td>
</tr>
<tr>
<td>Kitāb Zīj wa Risāla fīl-Ṭālīʿ wa Aḥkām al-Nujūm [mujalladin wāḥidin]</td>
</tr>
<tr>
<td>Kitāb Rawḍatuʿl-Munawwīmīn wa Kitāb Zīj-i Īlkhanī fīl-nujūm wa Fann-i Uqlīdus min Kitāb Durratuʿl-Tāj wa Kitāb Aḥkām al-Aʿwām fī aḥkām al-nujūm wa Burḥān al-Kifāya fīl-nujūm wa Tuḥfat al-Gharāʾib fī mujalladin wāḥidin</td>
</tr>
<tr>
<td>Zīj-i Khaqānī fī Takmīl-i Zīj-i Īlkhanī fīl-nujūm</td>
</tr>
<tr>
<td>Zīj-i Ulugh Beg fīl-nujūm</td>
</tr>
<tr>
<td>Kitāb al-Zīj al-Jāmīʿ li-Kūshyār fīl-nujūm wa Kitāb mujmāl al-uṣūl fī aḥkām al-nujūm li-Kūshyār wa Risāla Abī Maʿshar al-Balkhī fī ʾiḥtirāqāt al-kawākib fī mujalladin wāḥidin</td>
</tr>
<tr>
<td>Kitāb Kashf-i Ḥaqāʾiyiq-i Zīj-i Īlkhanī fī Sharḥ-i Zīj-i Īlkhanī li-Nizām al-Dīn fīl-Nujūm</td>
</tr>
<tr>
<td>Kitāb Kashf-i Ḥaqāʾiyiq-i Zīj-i Īlkhanī fī Sharḥ-i Zīj-i Īlkhanī fīl-nujūm</td>
</tr>
<tr>
<td>Kitāb Kashf-i Ḥaqāʾiyiq-i Zīj-i Īlkhanī fī Sharḥ-i Zīj-i Īlkhanī fīl-nujūm</td>
</tr>
<tr>
<td>Sharḥ-i Zīj-i Ulugh Beg fīl-nujūm</td>
</tr>
<tr>
<td>Sharḥ-i Zīj-i Ulugh Beg fīl-nujūm fī Mawlānā Mīrīm Chalabī sallamahallāh taʿālā fīl-nujūm</td>
</tr>
<tr>
<td>Sharḥ-i Zīj-i Īlkhanī fīl-nujūm</td>
</tr>
<tr>
<td>Sharḥ-i Zīj-i Īlkhanī al-musamma bi-Kashf-i Zīj-i Īlkhanī fīl-nujūm</td>
</tr>
</tbody>
</table>

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| Kashf-i Haqâyiq-i Zîj-i Îlkhâni fî Sharḥ-i Zîj-i Îlkhâni bi-khatt-i shâri'îhi fi'l-nujûm |
| Sharḥ-i Zîj-i 'Allî al-Qûshî raḥimaha Allah ta`âlâ bi'l-Fârsiyya fi'l-nujûm |
| Tarjama-i Risâla al-Jayb bi'l-Turkiyya min qibal al-hay`a wa'l-nujûm |
| Kashf al-Rayb fî `amal al-Jayb min qibal al-hay`a wa'l-nujûm |
| Risâla Kâfiyya fi'l-Ḥisâb wa Risâla Sî Faṣl bi'l-Fârsiyya fi'l-nujûm fî mujalladin wâhidin |
| Kitâb al-Ḥidâya fi'l-ḥikmat al-falsafiyya wa Sharḥ-i Kitâb al-Chaghmînî fi'l-hay`a wa Sî Faṣl li-Khâja Naṣîr fi'l-nujûm fî mujalladin wâhidin |
| Kifâya al-Ta'îm fi'l-nujûm |
| Kitâb al-Mukhtâr min kutub al-ikhtiyârât al-falakiyya fi'l-nujûm |
| Kifâya al-Ta'îm fi'l-nujûm |

| Al-Kitâb al-Bâdi` fî āhkhâm al-nujûm |
| Kitâb Kûshyâr fî āhkhâm al-nujûm wa Tarjama Kitâb Thamara-i Baṭlamiyûs bi'l-Fârsiyya fi'l-nujûm fî mujalladin wâhidin |
| Kitâb Madkhal al-Nujûm wa Kitâb Zâbdat al-Raml wa Kitâb Tâli` al-Waqt fi'l-nujûm |
| Kitâb Madkhal al-Nujûm wa Kitâb Uṣûl al-Malâhîm min qibal al-nujûm |
| Risâla Tashriḥ al-Ālâ min qibal al-nujûm |
| Kitâb Tarjama-i Kitâb Ŝuwar al-Kawâkib bi'l-Fârsiyya al-marqûm bi-annihî bi-khaṭṭ mutarjamîhi alladhi huwa al-Naṣîr Tûsî fi'l-nujûm |
| Risâla Wilâdat-i Cem rahimahallâhu wa huwa Ibn Muḥammad Khân tâba tharâhumâ fi'l-nujûm |
| Kitâb Madkhal manzûm fî āhkhâm al-nujûm wa Risâla Sî Faṣl fi'l-nujûm wa Risâla al-Uṣûrlâb min qibal al-nujûm fî mujalladin wâhidin |
| Kitâb fîhi Arba` Maqâllât fî āhkhâm al-nujûm wa Risâla al-Uṣûrlâb min qibal al-nujûm fî mujalladin wâhidin |

| Mukhtaṣar Madkhal ilâ `ilm āhkhâm al-nujûm wa Tarjama al-Mukhtaṣar al-Madkhal ilâ āhkhâm al-nujûm bi'l-Fârsiyya |
| Kitâb al-`Amal bi'l-Uṣûrlâb li-`Abd al-Raḥman al-Ṣûfî wa Risâla fi'l-`Amal bi'l-Uṣûrlâb al-kurri` li-Ḥâmid bin `Alî min qibal al-nujûm fî mujalladin wâhidin |
| Kitâb Manhaj al-Ṭullâb fî `Amal al-Uṣûrlâb min qibal al-nujûm |
| Kitâb al-Asl fî `ilm al-nujûm wa Sarâyîr al-Asrâr li-Abî Ma' shar al-Balkhî al-Munajjîm |
| Mukhtaṣar fî Ma` rifât al-Uṣûrlâb al-Naṣîr Tûsî min qibal al-nujûm wa Risâla al-Bâb al-Sâbî` min Kitâb Qustû fî'1-`amal bi'l-kurra wa Risâla fi'l-Farq bayn al-Dâd wa'l-Zâ min qibal `ilm al-Qir`a` a wa Risâla ukhrrâ fî mujalladin wâhidin |
| Sharḥ-i Bîst Bâb fî Ma` rifat-i Uṣûrlâb min qibal `ilm al-nujûm |
| Ikhtiyârât al-Āhkhâm al-`Alâ` iyya fi'l-nujûm |
| Ikhtiyârât al-Ahkhâm al-`Alâ` iyya fi'l-nujûm |
| Risâla Bîst Bâb fî Ma` rifat al-Uṣûrlâb wa Risâla Sî Faṣl fi'l-nujûm wa Risâla fi'l-Rub` al-Mujayyab wa Risâla fi'l-Rub` min qibal al-nujûm fî mujalladin wâhidin |
| Kitâb Jâmi` al-Mabâdî wa'l-Ghâyat ma`a Noqṣân al-Fann al-Râbi` min al-khar fî mujalladayn fi'l-nujûm |

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<p>| Kitāb Jāmi<code> al-Mabādī wa'l-Ghāyat fi mujalladayn fi'l-nujūm | | Risāla Mawḍī</code> al-Awqāt fi'l-nujūm |
| Tuhfat al-Fuqārā<code> fi Rub</code> al-Dā<code> ira min qibal al-nujūm | | Sharḥ-i Bīst Bāb fi Ma</code>rifat al-Uṣṭūrlāb fi'l-nujūm wa Risāla fi Kayfīyya al-<code>Amal bi'l-Uṣṭūrlāb al-Kurrī fi mujalladin wāḥidin | | Mujmal al-Ikhtiyārāt fi'l-nujūm | | Zubdat al-Hay</code>a wa Śī Fašl bi'l-Fārsīyya fi'l-nujūm fi mujalladin wāḥidin |
| Kitāb al-Ikhtiyārāt al-<code>Ālā</code>iyya fi'l-nujūm wa Kitāb al-Dalā<code>i il fi aḥkām al-nujūm fi mujalladin wāḥidin | | Risāla Tabyīn al-Awqāt fi Ma</code>rifat Waḏ<code> al-Rukhmāt min qibal al-nujūm | | Kitāb Jāmi</code> Qawānīn <code>ilm al-hay</code>a wa Risāla min qibal al-nujūm wa gayru hu fi mujalladin wāḥidin |
| Kitāb Yawāqīt al-Mawqūt min qibal al-nujūm |
| Kitāb al-Mi<code>a wa'l-</code>Ishrīn fi Ḥisāb al-Ḍarb min qibal al-nujūm |
| Risāla bi'l-Fārsīyya fi'l-nujūm wa'l-ṭībb |
| Sharḥ al-Ṣāfāyī bi'l-Āfāqiyya fi'l-nujūm |
| Tarjama Kitāb Thamara Baṭlāmyūs bi'l-Fārsīyya fi aḥkām al-nujūm |
| Kitāb al-Tafḥīm fi'l-nujūm |
| Kitāb al-Jadwal al-Āfāqī fi'l-nujūm |
| Tarjama Kitāb al-Jadwal al-Āfāqī bi'l-Turkīyya fi'l-nujūm |
| Kitāb Jadwal Tashīl al-Qamar wa Jadwal Tashīl <code>Uṭārīd li-</code>Imād al-Dīn al-Bukhārī fi'l-nujūm |
| Kitāb al-Mudhākirat <code>an Abī Ma</code>ṣhar al-Balkhī fi aḥkām al-nujūm |
| Kitāb Wilādat-i Iskandar bin <code>Umar Shaykh bin Amīr Taymūr min qibal al-nujūm | | Kitāb Mi</code>yar-i Āfītāb fi Sharḥ-i Bīst Bāb fi Ma<code>rifat-i Uṣṭūrlāb fi'l-nujūm | | Kitāb Tāľī</code>-i Wilādat-i Sultaṇ Muḥammad bin Sultaṇ Murād tāba tharāḥumā wa ja<code>ala al-janna mithwāhumā min qibal al-nujūm | | Kitāb Kūshyār fi aḥkām al-nujūm wa Kitāb Burhān Hay</code>a Falak wa Risālatān min qibal al-nujūm fi mujalladin wāḥidin |
| Kitāb Ikhwān al-Ṣafā fi funūn al-<code>ulūm ka-ali-riyādīyyāt mitīl </code>ilm al-<code>adād wa'l-handasa wa'l-nujūm wa gayriha | | Kitāb Ikhwān al-Ṣafā fi funūn al-</code>ulūm ka-ali-riyādīyyāt mitīl <code>ilm al-</code>adād wa'l-handasa wa'l-nujūm wa gayriha |
| Kitāb Ikhwān al-Ṣafā fi funūn al-<code>ulūm ka-ali-riyādīyyāt mitīl </code>ilm al-<code>adād wa'l-handasa wa'l-nujūm wa gayriha | | Kitāb Ikhwān al-Ṣafā fi thulūth mujallādāt | | Risāla fi Kayfīyya al-</code>Amal bi'l-Uṣṭūrlāb al-Kurrī li-kull <code>ardīn fi'l-nujūm | | Kitāb al-</code>Amal bi'l-Kurra<code> fi'l-nujūm | | Jāmi</code> al-Qismayn min al-riyādī wa'l-tābī<code>i fi'l-nujūm wa'l-ṭībb | | Sharḥ Śī Fašl al-musamma bi-Muwaḍḍīh al-Rūṣūm fi </code>ilm al-nujūm |</p>
<table>
<thead>
<tr>
<th>Risāla al-ʿUṣūrlāb al-musamma bi'l-Luḥāb fi'l-nuṣūm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risāla Aḥkām Tuḥlīʿ al-Shuʿrā naqālan ʿan Idrīs al-Nabī al-ayhissalām fi ʿilm al-nuṣūm</td>
</tr>
<tr>
<td>Risāla Maʿrifat al-Irtifāʿ bi-gayr al-ʿUṣūrlāb fi'l-nuṣūm</td>
</tr>
<tr>
<td>Kitāb Aḥkām al-ʿAlāʾiyya biʾl-Fārṣiyya fiʾl-nuṣūm</td>
</tr>
<tr>
<td>Bustān al-Ḥikma fi ʿIkhtiyyārāt al-nuṣūm</td>
</tr>
<tr>
<td>Kitāb al-Tafhīm fiʾl-nuṣūm</td>
</tr>
<tr>
<td>Kitāb al-Tafhīm fiʾl-nuṣūm</td>
</tr>
<tr>
<td>Ḳhams risāla fiʾl-ʿAmal biʾl-Rubʿ wa Risāla Quṣṭa fi al-ʿAmal biʾl-Kurra Dhāt al-Kursī fiʾl-nuṣūm fi muqalladīn wāḥīdīn</td>
</tr>
<tr>
<td>Kitāb al-ʿAmal biʾl-ʿUṣūrlāb liʾl-Šūfī wa Risāla al-ʿAmal biʾl-Kurra liʾl-Shaykh al-Muʿayyad fiʾl-nuṣūm fi muqalladīn wāḥīdīn</td>
</tr>
<tr>
<td>Kitāb al-Tafhīm biʾl-ʿArabīyya fiʾl-nuṣūm</td>
</tr>
<tr>
<td>Kitāb al-Masāʾ il liʾl-Qaṣrānī fiʾl-ʿilm aḥkām al-nuṣūm</td>
</tr>
<tr>
<td>Kitāb al-Masāʾ il liʾl-Qaṣrānī fiʾl-ʿilm aḥkām al-nuṣūm</td>
</tr>
<tr>
<td>Kitāb al-Masāʾ il liʾl-Qaṣrānī fiʾl-ʿilm aḥkām al-nuṣūm</td>
</tr>
<tr>
<td>Kitāb al-Masāʾ il liʾl-Qaṣrānī fiʾl-ʿilm aḥkām al-nuṣūm</td>
</tr>
<tr>
<td>Sharḥ-i Thamara-i Baṭlāmīyūs fiʾl-aḥkām al-nuṣūm</td>
</tr>
<tr>
<td>Kitāb al-Iḥtiyyārāt biʾl-ʿArabīyya al-manzūma fiʾl-aḥkām al-nuṣūm</td>
</tr>
<tr>
<td>Majmūʿa Rasāʾ il Ibn Al-Haytham baʾḏīha fi samt al-Qibli wa baʾḏīha fi khaṭṭ niṣf al-nahār wa baʾḏīha fi irtīfāʾ al-quṭb min qibal al-nuṣūm</td>
</tr>
<tr>
<td>Sī Faṣl biʾl-Fārṣiyya fiʾl-nuṣūm wa Madkhāl-i manzūm fiʾl-nuṣūm wa Rasāʾ il ukhrā fi muqalladīn wāḥīdīn</td>
</tr>
<tr>
<td>Majmūʿa min Rasāʾ il fiʾl-ʿAmal al-Ṣafīḥa waʾl-ʿAmal al-ʿUṣūrlāb wa gayruha</td>
</tr>
<tr>
<td>Tarjama-i Risāla al-Ṣafayḥ al-ʿAfāqiyya biʾl-Turkīyya min qibal al-nuṣūm</td>
</tr>
<tr>
<td>Risāla Wilādat-i Shāhzāda-i Aʾẓām Mahammad bin Sulṭān al-Salāṭīn Sulṭān Bāyezīd Ḣān zādallāh taʾala saʾādatuhuma fi al-dārayn min qibal al-nuṣūm</td>
</tr>
<tr>
<td>Tarjama-i Thamara-i Baṭlāmīyūs biʾl-Fārṣiyya fiʾl-aḥkām al-nuṣūm</td>
</tr>
<tr>
<td>Sharḥ-i Sī Faṣl fiʾl-nuṣūm</td>
</tr>
<tr>
<td>Sī Faṣl biʾl-ʿArabīyya fiʾl-nuṣūm</td>
</tr>
<tr>
<td>Ţāliʿiʾi Wilādat-i Muhammad Khān bin Murād Khān ṭaba tharāḥumā wa jaʾala al-janna mathwāḥumā min qibal al-nuṣūm</td>
</tr>
<tr>
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<td>Majmūʿa fīḥā Kutub al-Handasa waʾl-Hayʿa wa gayriha</td>
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<td>Kitāb Taḥrīr Majīṣī liʿl-Naṣīr Ṭūsī fīl-hayʿa</td>
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<td>Sharḥ Mulakhkhāṣ al-Chaghmīnī li-Qāḍīzāda al-Rūmī fīl-hayʿa</td>
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<td>Ḥashiya Sharḥ Qāḍīzāda al-Rūmī liʾl-Chaghmīnī fīl-hayʿa</td>
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<p>| Sharḥ Qāḍīzāda al-Rūmī li’l-Chaghmīnī fīl-hay’a | Sharḥ al-Tuḥfat al-Shāhiyya fī ‘ilm al-hay’a |
| Kitāb al-Tuḥfat al-Shāhiyya fī ‘ilm al-hay’a | Sharḥ Ashkāl al-Tā’sīs fīl-handasa |
| Sharḥ Mulakhḵhaṣ al-Chaghmīnī al-musamma bi-Ṭurur al-Mulakhḵhaṣ fīl-hay’a bi-khaṭṭ mu’allifihi | Sharḥ Mulakhḵhaṣ al-Chaghmīnī li’l-Sayyīd Sharīf fī ‘ilm al-hay’a |
| Tāḥrīr Majisṭī fī ‘ilm al-hay’a | Kitāb al-Tuḥfat al-Shāhiyya fī ‘ilm al-hay’a |
| Majmū‘a min al-mutawassīṭāt wa gayruha min qibal al-handasa wa’l-hay’a | Hawāshī al-Tuḥfat al-Shāhiyya fīl-hay’a |
| Mulakhḵhaṣ al-Chaghmīnī fīl-hay’a wa sharḥuḥu li’l-Sayyīd al-Sharīf fī mujalladin wāḥidin | Risāla Mawlānā ‘Alī al-Qūṣī bi’l-Fārsīyya fīl-hay’a |
| Sharḥ Qaṣīda al-Garā’ fī Ḥarākāt al-Aflāk min qibal al-hay’a | Al-Qaṣīda al-Garā’ fī Ḥarākāt al-Aflāk min qibal al-hay’a |
| Kitāb Ablūnīyūs fīl-Makhrūṭāt tašannā’u Abī al-Ḥusayn fīl-handasa | Kitāb Ta[lkhiṣ al-Makhrūṭāt fīl-handasa |
| Majmū‘a fīhā Kitāb Uqlīdīs li’n-Nasīr Ṭūsī fīl-Handasa wa Rasā’īl ukhrā fīl-handasa wa gayruha fī mujalladin wāḥidin | Kitāb Jihān-Dānīsh fīl-hay’a |
| Majmū‘a min Kutub al-Hay’a wa’l-Handasa awwaluha Kitāb Ablūnīyūs | Sharḥ al-Tadhkīra bi-khaṭṭ al-Shārīḥ fīl-hay’a |
| Kitāb Talkhiṣ al-Makhrūṭāt fīl-handasa | Risāla fīl-Tawḥīd ilāl-Ḥayya al-Dā’ ima wa Risāla al-Barkār al-Shām min qibal al-handasa fī mujalladin wāḥidin |
| Majmū‘a min Rasā’īl Abī al-Futūḥ awwaluha fīl-Shakl al-Rābi’ fīl-Manṭiq wa’l-Bāqīyya fīl-Handasiyyāt | Majmū‘a min Rasā’īl Abī al-Futūḥ awwaluha wa sharḥ Ashkāl al-Tā’sīs li-Qāḍīzāda al-Rūmī fīl-Handasa wa Mutun Ḥikma al-Hidāya fī mujalladin wāḥidin |
| Al-Risāla al-Mu’ayyaniyya bi’l-Fārsīyya fīl-Hay’a | Al-Risāla al-Mu’ayyaniyya bi’l-Fārsīyya fīl-Hay’a |
| Hāshiya Sharḥ al-Chaghmīnī fīl-hay’a | 351 |</p>
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## Appendix C: The list of examined extant taqwīms from the mid-fifteenth to the early-seventeenth century

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Evrak (E.): 1698, 5375, 5605, 6172, 9555, 9802, 10053, 10159/6, 10159/145, 10818.

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İstanbul Atatürk Kitaplığı

Muallim Cevdet O. 71.

İstanbul Müftülüğü Şerîye Sicilleri

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<td>[Mīrīm Çelebi, <em>Masâʾ īl dar Taʿṣīrāt-i Nujûm</em>]</td>
</tr>
<tr>
<td>Darûlmesnevi Ms. 345</td>
<td>[Ḥâce Aṭâʿ ullâh, <em>Risâla-i Rub</em>]</td>
</tr>
<tr>
<td>Esad Efendi Ms. 1997</td>
<td>[Khiṭābī, <em>Ṭâlî-i Mavlâd-i Sûltân Muḥammed</em>]</td>
</tr>
<tr>
<td>Esad Efendi Ms. 2147</td>
<td>[Kashfī, <em>Ṣelîmnâme</em>]</td>
</tr>
<tr>
<td>Esad Efendi Ms. 2198</td>
<td>[Idrîs Bîdîsî, <em>Hasîb Bihisht</em>]</td>
</tr>
<tr>
<td>Esad Efendi Ms. 3782</td>
<td>[Ibn Kemâl?, <em>Risâle-i Tîlsîmâr</em>]</td>
</tr>
<tr>
<td>Fatih Ms. 3421</td>
<td>[Nîzâm al-Dîn Nîsâbûrî, <em>Kashf al-haqâʾiq fī sharḥ Zīj-i İlkhânî</em>]</td>
</tr>
<tr>
<td>Fatih Ms. 4357</td>
<td>[Ibn al-ʿUlâyf, <em>al-Durr al-manṭûm fī manâkib Bâyezîd malik al-Rûm</em>]</td>
</tr>
</tbody>
</table>

| Hacı Mahmud Ms. 6344          | [Seyfullâh Çelebi, *Risâla fī ʿt-taḥāvîm*] |
| Hafid Efendi Ms. 205/1         | [Ḥâce Ebrî, *Mehâme-i Ibn ʿÂdîl*] |
| Hamidiye Ms. 848               | [Mīrīm Çelebi, *Sharḥ-i Zīj-i Ulugh Beg*] |
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| M. Nuri Efendi Ms. 151         | [Mīrīm Çelebi, *Sharḥ-i Zīj-i Ulugh Beg*] |
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III. Ahmed (A.) 1960 [Yūsuf b. ʿOmer el-Sāʿati, taqwīm of the year 916/1511]
III. Ahmed (A.) 2010 [Abdurrahmān munajjim, Jawhar bīf al-ṣiḥḥat fī al-ṭibb]
III. Ahmed (A.) 2128 [Epistle of Iḥwān al-Ṣafāʾ on Aṣṭruṇūmiyya
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III. Ahmed (A.) 3343 [Marrākushiʾs Jāmiʿ al-mabādīʾ wa ʾl-,ghayāt fī ʿilm al-mīqāt]
III. Ahmed (A.) 3495 [ʿAbd al-salām al-muhtadī, Ma riṣālat ḥaṣīqat al-kawākib]
III. Ahmed (A.) 3497 [Seyyid Mūneccim el-Tokātī, taqwīm of the year 937/1531]
Bağdat (B.) 309 [Anonymous taqwīm of the year 856/1452]
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Bağdat (B.) 312 [ʿAbdulkerim b. Mevlānā Sinān, taqwīm of the year 900/1495]
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Emanet Hazinesi (EH.) 1712 [Ṣalmān, taqwīm of the year 909/1504]
Hazine (H.) 1760 [Partial Külliyāt-i Mirīm Çelebi]
Revan (R.) 822 [Külliyāt-i Za īfī]
Revan (R.) 1704 [Anonymous, Miftāḥ al-nuṣūm]
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Revan (R.) 1711/11  [Anonymous taqwīm of the year 920/1515]
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Yeni Yazmalar (YY.) 830  [Khiṭābī, Țali’-i Mavlūd-i Sulṭān Muḥammad]

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