Orientalism and the History of Arabic Astronomy: The Transmission of Astronomical Knowledge to the West

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Abstract:

This study addresses a central historiographical question: did Orientalist scholarship fairly acknowledge the scientific contributions of Arabic astronomy, or did it reinterpret them through Eurocentric assumptions? To investigate this, the paper examines the role of Arab scholars in developing astronomical tables (Zījes), traces the pathways through which this knowledge was transmitted to the West via the translation movement, and analyzes Orientalist perspectives on Arabic sciences, with particular attention to the work of David A. King. The study adopts a historical-analytical method and concludes that Arab astronomers made foundational contributions to European astronomical knowledge, and that modern Orientalist scholarship-despite its limitations-has provided valuable tools for understanding and preserving this heritage.

Keywords: Arabic astronomy, Astronomical tables (Zījes), Orientalism, Knowledge transmission, Islamic civilization.

INTRODUCTION

The relationship between Orientalism and Arabic sciences represents a complex historiographical field that reflects centuries of cultural and intellectual exchange between East and West. European historians of science devoted considerable effort to tracing the development of astronomy across civilizations, recognizing that the discipline could not be understood in isolation from its Arabic-Islamic phase [Chaouch,2001].

The present study focuses on a specific and underexamined question: how did Orientalist scholarship interpret, represent, and in some cases reassess the contributions of Arabic astronomy to the formation of European scientific knowledge? This question matters because existing literature tends either to celebrate Arabic contributions in general terms or to dismiss them as mere transmission. A more rigorous approach is needed-one that examines different Orientalist positions, evaluates their evidence, and identifies where modern scholarship has revised earlier judgments.

The paper argues that Arab astronomers did not merely preserve and transmit earlier knowledge from Indian, Persian, and Greek sources; they refined, corrected, expanded, and restructured it, producing original works-particularly astronomical tables (Zījes)-that became foundational references in European astronomy for several centuries. The role of Orientalist scholars, especially David A. King, in documenting and recovering this heritage is also examined critically.

- **Research gap:** While the influence of Arabic astronomy on Europe has been acknowledged in general histories of science, a systematic analytical examination of Orientalist positions toward Arabic astronomical works-distinguishing between different scholarly trends and their methodological assumptions-remains limited in the existing literature.
- **Objectives of the Research:**

1. To identify the principal pathways through which Arabic astronomical knowledge was transmitted to the West.
2. To analyze Orientalist positions toward Arabic astronomy, distinguishing between recognition of originality, technical appreciation, and Eurocentric reductionism.
3. To assess the contribution of David A. King as a representative of modern critical Orientalist scholarship.

- **Research Methodology:** The study adopts a historical-analytical method. Primary and secondary sources on Arabic astronomical tables (Zījes), translation movements, and Orientalist historiography are examined, contextualized, and evaluated. Evidence is drawn from documented astronomical manuscripts, published Zījes, and the scholarly literature on the history of Islamic science.

SECTION 1: THE SCOPE AND EVOLUTION OF ORIENTALIST SCHOLARSHIP

The origins of Orientalism trace back to the Middle Ages, when leading European universities began to engage with Arab/Islamic civilization owing to its remarkable contributions to the sciences, philosophy, and the humanities. Orientalists are Western scholars and researchers who specialized in studying the cultures and civilizations of the Middle East, with particular emphasis on Islamic civilization and Arabic sciences [Al-Tamimi,2021].

This Western scholarly interest was not confined to the humanities; European scientists of the natural sciences also acknowledged the foundational role of Islamic astronomy. From a contemporary European perspective, [Kerner,2026] demonstrates that the mathematical and astronomical achievements of the Islamic world during its golden era were not peripheral to the history of science but constitutive of it, noting in particular the contributions of al-Khwarizmi, al-Battani, and al-Zarqālī to the development of algebra, observational astronomy, and planetary tables that shaped European science for centuries.

It is therefore important to distinguish between different Orientalist trends rather than treating them as a single unified perspective. Some Orientalists—such as Jourdain, Wüstenfeld, and Suter in earlier periods—worked primarily on cataloguing and translating Arabic manuscripts. Others, like David A. King (b.1360 AH/1941 CE) in the modern era, undertook deep analytical reassessments of Arabic astronomical contributions that challenged Eurocentric narratives. A critical reading of Orientalist scholarship must account for these differences.

SECTION 2: ARAB SCHOLARS AND THEIR CONTRIBUTIONS TO ASTRONOMY

2.1 FROM RECEPTION TO ORIGINAL CONTRIBUTION

Astronomy was known in Iraq more than a century before the Arab conquest [Wat,2016]. Arab scholars acquired astronomical knowledge from Indian, Persian, and Greek sources, but their contribution was not limited to transmission. They refined, corrected, and significantly expanded existing knowledge, presenting it in new systematic forms and subjecting every issue to rigorous observational investigation [Badr,1982; Yagi,1997].

Muslim scholars redirected the science of the stars away from astrology, which they associated with speculation, and toward empirical observation, measurement, and verification. They observed the celestial spheres, compiled Zījes, measured latitudes, and monitored planetary movements with increasing precision [Farraj,2002].

Among their documented scientific achievements were: establishing the sphericity of the Earth and its rotation on its axis; accurately estimating its circumference; precisely measuring the solar year; and compiling detailed tables for planetary positions using advanced instruments such as the astrolabe, the sundial (Mizwala), and the altitude-measuring instrument [Yagi,1997; Hamoud & Mawaldi,2023].

2.2 THE PRESERVATION OF ANCIENT HERITAGE

One of the most significant contributions of Arab and Muslims in astronomy were the compilation of Zījes and the preservation of ancient heritage from loss by translating astronomical books into Arabic, such as Ptolemy's Almagest (Ptolemy, ca. 100-170 CE; Arabic dates erroneously given as (554 BC/90 CE – 484

BC/168 CE) [Mahfouz et al.,2010;Al-Hamd,2000], whose original Greek text was lost, surviving only in its Arabic translation [Mahasna,2001].

The Almagest served as the foundational theoretical text, translated by the late 8th century CE, revised multiple times, and accompanied by numerous commentaries and introductions [Wat,2016]. The first to oversee its interpretation and translation into Arabic was the Barmakid Yahya ibn Khalid (805 CE/190 AH), minister to Harun al-Rashid [Sezgin,2008], or alternatively through alHasan ibn Quraysh (9th century CE/3rd century AH) for Caliph al-Ma'mun [Al-Nadim,1971; King et al.,2001].

It remained a reference until the 10th century CE, when the scholar Abd al-Rahman al-Sufi (291 AH/903 CE – 376 AH/986 CE) translated it [Al-Sufi,1981], added his personal observations, and corrected its errors, producing his Book on the Images of the Forty-Eight Constellations, which was more accurate and comprehensive than the Almagest and served as a reference in astronomy until the early 20th century [Al-Sawaf,n.d].

2.3 THE ZĪJES: ORIGINAL ASTRONOMICAL PRODUCTION

Most Arab astronomical works were not purely theoretical but focused on the compilation of Zījes—astronomical handbooks containing tables for the positions of the Sun, Moon, planets, and fixed stars. These drew on Indian, Persian, and Greek traditions but introduced Arab astronomers' own corrections, observations, and computational refinements.

Arab astronomers, following Ptolemy's view, believed in a stationary Earth with eight spheres revolving around it: the Sun, Moon, five planets, and fixed stars. Applying this system to observed phenomena required numerous astronomical instruments. Over time, the Arabs recognized the weaknesses in Ptolemy's theory and criticized it, despite the significant simplifications to astronomy by Ibn al-Shatir al-Dimashqi (ca. 750 AH/1350 CE).

This critical tradition did not cease with Ibn al-Shatir; it continued in the works of later Islamic astronomers who pushed further against Aristotelian natural philosophy. As [Ragep,2024] has demonstrated in his analysis of ʿAlī Qūshjī (d. 879/1474) and his critic al-Bīrjandī, Islamic astronomers actively debated the possibility of the Earth's motion on empirical rather than philosophical grounds — a discourse that predates and arguably influenced the Copernican framework. This demonstrates that Arab astronomical thought was not static but constituted a living and self-critical scientific tradition.

Al-Battani's (ca. 900 CE/286 AH) Zīj (244 AH/858 CE – 317 AH/929 CE), for example, was of exceptional precision; his eclipse observations remained useful as late as 1749 CE/1162 AH [Wat,2016].

Al-Biruni's Al-Qanun al-Mas'udi (362 AH/973 CE – 440 AH/1048CE) became the primary source for all astronomical works [Al-Saadi,2012; Al-Hamd,2000], al-Tusi (597 AH/1201 CE – 672 AH/1274 CE) [Al-

Zirkali,2002,Vol.8], and others. Al-Sufi's Book on the Images of the Forty-Eight Constellations served as the fundamental celestial atlas.

Among the most distinguished figures in this tradition was Abu al-Wafa' al-Buzjani (328 AH/940 CE – 387 AH/997 CE) [Brockelman,1959], who compiled comprehensive astronomical tables in his Al Zīj al- Wadih (The Clear Tables), which meticulously calculated the positions of stars. Equally influential was Al-Battani, the author of Al-Zīj al-Sabi' (The Sabean Tables). Both of these Zīj (astronomical handbooks) had a profound and lasting impact on the development of astronomical science in both the Eastern and Western worlds.

Astronomy was one of the first sciences to receive significant patronage in Baghdad. The study of its principles was not confined to Arab scholars; subsequent generations followed their methodology and inherited their knowledge. This lineage is exemplified by Ulugh Beg and his famous Zīj , which can be considered the final, exemplary product of the Baghdad school, whose golden age spanned seven centuries (132 AH/750 CE – 853 AH/1450 CE).

The Zīj of Ulugh Beg, known as the "New Sultanic Zīj" stands among the most significant astronomical works, in which he compiled and corrected the results of previous observations conducted over twelve years [Abdullah,Mawaldi,2016]. Its tables were translated into Latin, and Europeans benefited greatly from them [Al-Sheikh,2014].

2.4 OBSERVATORIES AND INSTRUMENTS

The Arab scholars' mathematical foundations were instrumental in establishing their preeminence in astronomy. This is demonstrably evidenced by the numerous sophisticated astronomical observatories established across the Islamic world, including those in Samarkand, Damascus, Cairo, Fez, Toledo, Córdoba, and Maragheh. These institutions enabled systematic, long-term observational programs that produced data of unprecedented accuracy.

SECTION 3: TRANSMISSION OF ARABIC ASTRONOMICAL KNOWLEDGE TO THE WEST

3.1 THE TRANSLATION MOVEMENT THE TRANSMISSION OF ARABIC

The transmission of Arabic astronomical knowledge to Europe occurred primarily through organized translation movements, centered first in al-Andalus (Islamic Spain) and later in Sicily and southern Italy. When European scholars came into contact with Arabic science from the 10th century onward, they found a body of knowledge far more advanced than what was available in Latin.

A substantial number of star names and astronomical terms in modern European languages are directly derived from Arabic vocabulary [Farroukh, 1970]. Europeans thus first encountered Ptolemy's *Almagest* through its Arabic translation——indeed, the title "Almagest" is itself an Arabic coinage [Yagi, 1997].

3.2 AL-KHWARIZMI AND THE TRANSMISSION OF NUMERALS

The transmission of Indian knowledge to the Arab world occurred through the translation of the book Sindhind into Arabic during the reign of Caliph Al-Mansur. This translation was initially performed by Al-Fazari (who flourished in the 2nd Hijri century/8th century CE) [Al-Qifti,n.d], and subsequently by Al-Khwarizmi (died after 232 AH/847 CE) [Brockelman,1959]. Muhammad al-Fazari's translation of Sindhind for Al-Mansur served as the foundational text for astronomical calculations among the Arabs and remained their primary reference until the era of Al-Ma'mun.

During Al-Ma'mun's time, Muhammad ibn Musa al-Khwarizmi excelled. Possessing extensive knowledge of the stars, he created his own Zīj , the Zīj al-Khwarizmi, which synthesized the astronomical traditions of the Indians, Persians, and Romans. While he based its foundation on the Sindhind, he introduced his own corrections (ta'adil) and obliquity (mayl). His corrections followed the Persian school, and the obliquity of the sun was based on the Ptolemaic system. The work was structured into excellent chapters, earning the admiration of his contemporaries, although its chronology was based on the Persian calendar.

This work was later adapted to the Arabic calendar by Maslama ibn Ahmad al-Majriti al-Andalusi (d. 398 AH/1007 CE) [Farraj,2002]. Through this process, the Arabs became intimately acquainted with the Indian systems of mathematics, studied the Indian numerals, refined them, and developed two distinct series:

1. The first, known as the Hindu numerals (or Eastern Arabic numerals), comprising: “1,2,3,4,5,6,7,8,9”, which are used predominantly in the Arab East (Mashriq).
2. The second, the Ghubar numerals (known as the Arabic numerals), which were arranged based on angles, comprising: “1,2,3,4,5,6,7,8,9”, and whose use became prevalent in the Arab West (Maghrib).

Crucially, Al-Khwarizmi is credited with adding the zero (0) to this numerical system, a contribution that revolutionized mathematics.

Following Europe's engagement with Arabic sciences, beginning in al-Andalus, the West discovered that the dust numerals (Arabic numerals) were more suitable for their use than Roman numerals, owing to the difficulty of employing the latter in addition and subtraction, and their impracticality in multiplication and division [Harbi,2004].

Credit is thus due to Arab astronomers for transmitting Indian arithmetic [Saliba,2005], particularly to the Arab scholar al-Khwarizmi, who introduced both Indian and Arabic numerals to the West through his work al-Sindhind. These numerals were initially named after him as "Algorisms" [Harbi,2004].

The Western scholar Liberi (fl. 1838 CE) mentions the existence of a manuscript titled Liber ysagomarum alchorismi in artem astronomican in Magistro A compositus, which represents one of the Latin translations in Paris of al-Khwarizmi's book on Indian arithmetic. It contains astronomical tables demonstrating that its author, Pierre Alfonso (1227 AH/1813 CE- 1270 AH/1854 CE), based his work upon the tables established by al-Khwarizmi [Saliba,2005].

3.3 THE TOLEDO TABLES AND THE ALFONSINE TABLES

The Arab scholar Abū Isḥāq al-Zarqālī (d. ca. 490 AH/1096 CE) was the first to systematically establish Andalusian astronomy in Córdoba in the 11th century. His astronomical tables (Zīj al-Tulaytilah) known as the Toledo Tables (compiled after 1068 CE) was found in Munich, executed by Gerardus Cremonensis (508 AH/1114 CE – 583 AH/1187 CE) [Saliba,2005], and they became the primary reference in astronomy in Europe for three centuries, used in Paris, London, Toulouse, Pisa, and Marseille from the 10th to the 13th century CE [Fahd, 1981], [Al-Mumin,1992].

The Alfonsine Tables (Tabulae Alphonsinae) were subsequently compiled in the second half of the 13th century, modeled on al-Zarqālī's Toledo Tables, at the request of Alfonso X, King of Castile. They became dominant in European astronomy during the 14th century, notably in Paris from 1320 CE. Their first printed edition dates to 1443 CE and was among the first astronomical books purchased by Copernicus during his studies in Kraków [Fahd, 1981], see Figure 2).

It should be noted, however, that the intellectual authorship of the Toledo Tables belongs to al-Zarqālī, not to Alfonso X, who commissioned their translation and under whose name they were subsequently known in European scholarship.

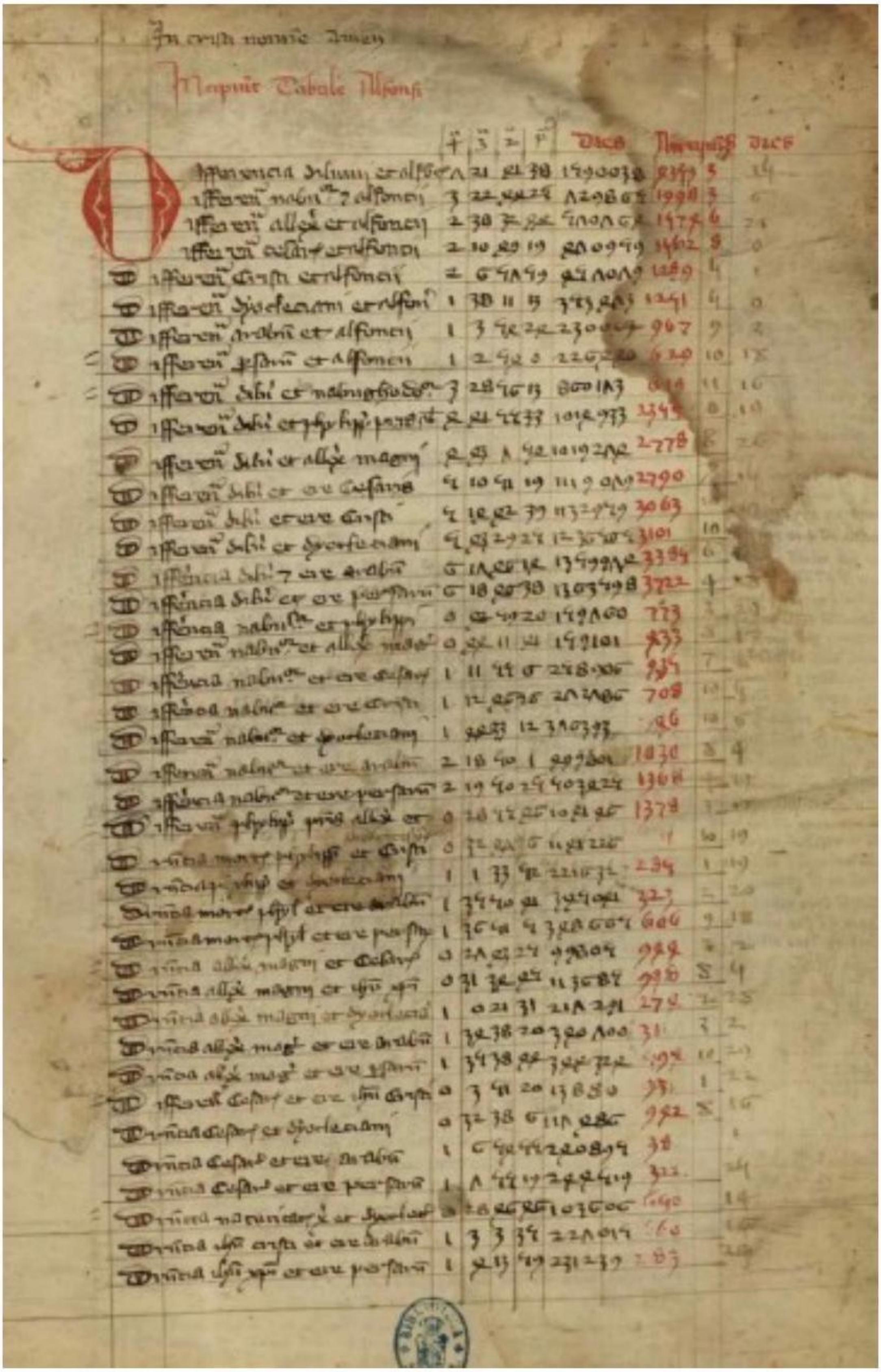

Figure 2: A snapshot of the tables attributed to Alfonso (fol. 1r).) [Alfonso,1252].

Zīj / Table	Author	Date (approx.)	European Reception
Zīj al-Khwarizmi	Al-Khwarizmi	9th c. CE	Translated into Latin; basis for European arithmetic
Zīj al-Battani	Al-Battani	ca. 900 CE	Eclipse data used until 1749 CE
Toledo Tables	Al-Zarqālī	after 1068 CE	Primary European reference, 10th–13th c.
Al-Qanun al-Mas'udi	Al-Biruni	11th c. CE	Primary source for subsequent Zījes
New Sultanic Zīj	Ulugh Beg	15th c. CE	Translated into Latin; widely used in Europe
Alfonsine Tables	Based on al-Zarqālī	13th c. CE	Dominant in Europe, 14th–15th c.

Table 1: Key Arabic Astronomical Tables and Their European Reception

3.4 RECOGNITION BY WESTERN ASTRONOMERS

When the Western astronomer Hevelius observed the Moon-and was the first to do so in 1647-he identified several craters and named some after Arab astronomers. Ten craters bear the names of Arab astronomers, as follows:

1. Al-Farghani (327 AH – 398 AH/939 CE - 1007 CE) [Al-Zirkali,2002,Vol.1].
2. Al-Battani.
3. Al-Sufi; fixed stars were derived from al-Sufi, retaining the names he assigned.
4. Al-Hasan ibn al-Haytham (354 AH/965 CE – 430 AH/138 CE) [Al-Zirkali,2002,Vol.6].
5. Nasir al-Din al-Tusi.
6. Thabit ibn Qurra (221 AH/836 CE – 288 AH/901 CE) [Al-Zirkali,2002,Vol.2].
7. Ulugh Beg (796 AH/1393 CE – 853 AH/1449 CE) [Al-Mumin,1992].
8. Jabir ibn Aflah (450 AH/1145 CE) [Al-Mumin,1992].
9. Al-Ma'mun (198 AH/814 CE – 217 AH/833 CE), in recognition of his patronage of astronomy [King et al.,2001].

10. Abu al-Fida' (672 AH/1273 CE – 732 AH/1331 CE) [Abu al-Fida,n.d].

The fixed-star nomenclature also derives substantially from al-Sufi's catalogue. These acts of scholarly acknowledgment reflect the extent to which Arabic astronomical work was recognized as foundational by European scientists themselves, also these are clearly visible on the full segmented lunar map divided into two inverted sections, as images typically appear inverted in astronomical observatories, as shown in Figure 1 below [Badr,1982]:

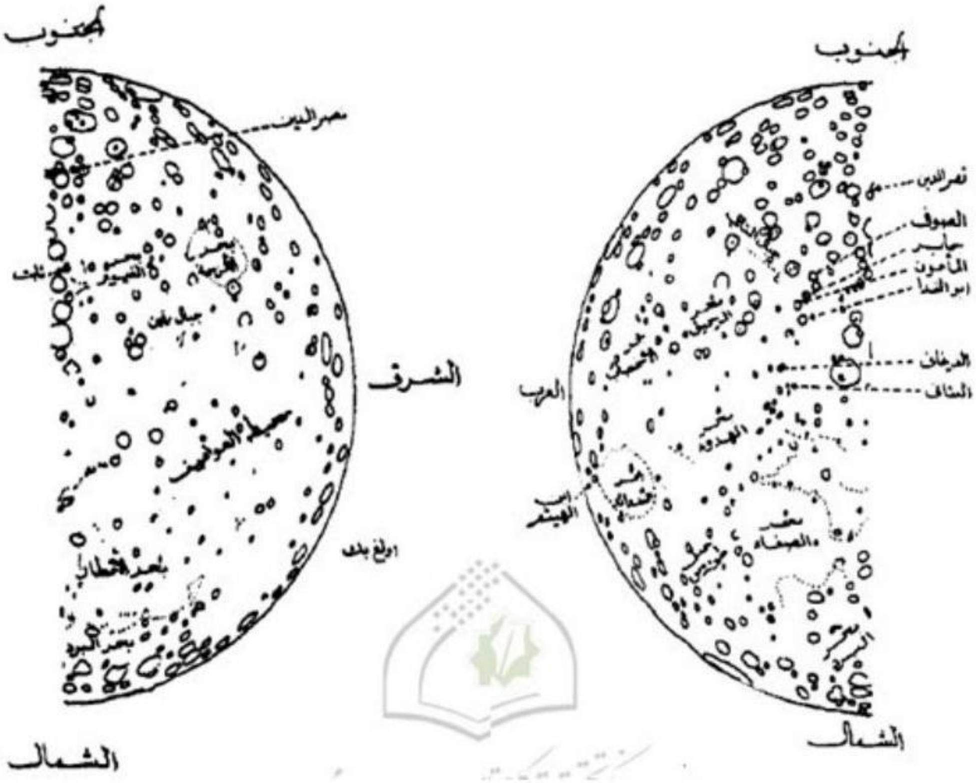

Figure 1: The complete lunar map divided into two mirrored halves (the eastern half and the western half) [Badr,1982].

Regarding the development of astronomy, Arab astronomers played a significant role in the astronomical studies of the Chinese since the thirteenth century, despite the latter's civilizational genius.

The current era of scientific research is closely linked to the study and publication of works related to the history of Arab/Islamic sciences by major Arab scholars, particularly concerning astronomical works. This field has garnered significant attention from Russian historians of science (Mamedbeyli, Rozenfeld, Roganskaya, Bulgakov, Akhmedov, Sergeeva, Matvievskaya, and others) regarding various astronomical and mathematical issues [Al-Hamzah,2022].

SECTION 4: ORIENTALIST SCHOLARSHIP AND ITS CONTRIBUTION TO ARABIC SCIENCES

4.1 GENERAL CONTRIBUTIONS

Orientalists made significant contributions to the study, documentation, and dissemination of Arabic and Islamic sciences. Their work included: the cataloguing and translation of Arabic manuscripts; the preservation of texts that might otherwise have been lost; the analysis of Arabic scripts and scholarly traditions within their historical context; and the development of academic fields related to Arabic language and Islamic intellectual history.

These contributions played a role in cultural exchange, significantly influencing modern understanding of Arabic and Islamic sciences and helping to preserve and disseminate the Arab heritage internationally [Abdullah, 2018].

4.2 DAVID A. KING: A CASE STUDY IN CRITICAL ORIENTALISM

David A. King represents one of the most influential modern scholars in the history of Islamic astronomy. His work is significant not only for its volume but for its critical depth: King documented the use of astronomy in the service of Islamic civilization over more than a thousand years, through research visits to Arab countries and sustained engagement with primary manuscript sources, including work at the Institute for the History of Arabic Science in Aleppo, Syria.

King published the first comprehensive overviews of astronomical practice in Egypt, Yemen, and Morocco. He authored a major study on astronomical instruments and prayer-time calculations in Islamic civilization, demonstrating that Muslim scholars and philosophers did not merely rely on Greek knowledge but advanced the field through new and sophisticated original contributions [King, 2024]. [Abdullah ,2025] has extended this line of inquiry by examining both the historical and computational dimensions of Qibla determination, demonstrating through spherical trigonometry and classical instrument analysis — including the astrolabe — the mathematical sophistication that Islamic astronomers brought to the resolution of practical religious requirements. Their work confirms that the tradition documented by King remains a productive area of original Arabic scientific contribution.

King also noted that the Zījes of Ulugh Beg and al-Kāshī (d. ca. 832 AH/1428 CE) [Al-Mumin,1992], as well as the "New Zīj" by Ibn al-Shaṭir (704 AH/1304 CE- 777 AH/1375 CE) [Kennedy,1983]—the latter considered the pinnacle of astronomical science in Islamic Syria-were adapted and used by European astronomers, while later European tables (such as those of Cassini and Lalande, translated from French into Turkish and Arabic) failed to replace them [King, 1977]. This observation underscores the enduring practical value of Arabic astronomical tables in scientific practice.

King's work exemplifies a trend in modern Orientalist scholarship that goes beyond description to offer critical reassessment, distinguishing itself from earlier scholarship that often-reduced Arabic astronomy to a mere bridge between ancient Greek and modern European science.

4.3 A COMPARATIVE VIEW OF ORIENTALIST POSITIONS

It is important to distinguish between different trends within Orientalist scholarship rather than treating it as a monolithic tradition:

Trend	Characteristic Approach	Limitation	Representative Figures
Cataloguing/translation (19th c.)	Identifying and publishing Arabic manuscripts	Largely descriptive; limited critical analysis	Wüstenfeld, Suter
Diffusionist	Acknowledging Arabic role primarily as transmitters of Greek knowledge	Underestimates Arab originality	Some early 20th-c. historians
Critical-analytical (modern)	Examining Arabic astronomy on its own terms; identifying original contributions	Still developing; occasionally Eurocentric in framing	David A. King, E.S. Kennedy, George Saliba

Table 2: Selected Orientalist Trends Toward Arabic Astronomy

Modern scholarship, particularly the work of Kennedy, Saliba, and King, has substantially revised the diffusionist view, demonstrating that Arabic astronomers made genuinely original contributions to planetary theory, observational astronomy, and astronomical instrumentation.

SECTION 5. RESULTS

The analysis yields the following principal findings:

1. Arab astronomers made original and foundational contributions to the science of Zījes (astronomical tables), which went beyond the transmission of earlier knowledge to include systematic refinement, correction through precise observation, and the introduction of new computational methods.

2. The intellectual authorship of the Toledo Tables rests with the Arab scholar al-Zarqālī, not with Alfonso X of Castile, who commissioned their translation. This distinction matters for an accurate historiography of European astronomy.

3. European astronomy of the late medieval and early modern periods was substantially dependent on Arabic astronomical tables, instruments, and terminology—a dependence that is evidenced by Latin translations, named lunar craters, and star nomenclature of Arabic origin.

4. Orientalist scholarship toward Arabic astronomy has not been uniform. A meaningful distinction must be drawn between earlier approaches that treated Arabic astronomy primarily as a transmission channel, and modern critical scholarship—exemplified by David A. King—that recognizes Arabic astronomy as a site of original scientific production.

5. Contemporary Orientalism research is moving away from imperial historiographical frameworks toward interdisciplinary approaches that incorporate postcolonial theory, digital manuscript analysis, and critical reassessment of earlier biases. Arab scholars are increasingly reevaluating Orientalist work from their own perspectives, retaining useful methodological tools while reinterpreting their heritage on their own terms.

SECTION 6. RECOMMENDATIONS

Based on the findings of this study, the following specific recommendations are offered:

1. For historians of science: Comparative historiographical studies are needed that systematically examine how different Orientalist scholars framed Arabic astronomy across different periods, distinguishing between recognition of originality, technical appreciation, and reductive transmission narratives.

2. For archivists and librarians: The digitization of Arabic astronomical manuscripts—particularly unpublished Zījes—should be prioritized to make primary sources accessible to international researchers and to reduce dependence on secondary Orientalist interpretations.

3. For Arab research institutions: Collaboration between Arab historians and their Western counterparts in the production of critical editions of Arabic astronomical texts would significantly advance the field and ensure that Arabic scientific heritage is interpreted from a perspective informed by both linguistic and cultural competence.

4. For educators: The contributions of Arab astronomers should be accurately represented in curricula related to the history of science, correcting the persistent underrepresentation or misattribution of Arabic astronomical achievements in European-origin textbooks.

CONCLUSION

Arab and Muslim scholars played a pivotal and original role in the advancement of astronomy, contributing not merely as preservers and transmitters of earlier knowledge, but as systematic investigators who refined, corrected, and significantly expanded the astronomical sciences. Their observational programs, Zījes, instruments, and mathematical innovations formed the foundation upon which European astronomy was rebuilt during the late medieval period.

The role of Orientalist scholarship in transmitting and interpreting this knowledge to the West is significant but cannot be evaluated without acknowledging its internal diversity. Earlier scholarship often underestimated Arab originality; modern critical scholarship, exemplified by David A. King, has substantially reassessed this legacy. The study of Arabic and Islamic science ultimately requires an understanding of the cultural and scientific elements exchanged between East and West—and a recognition that the history of astronomy is a shared human achievement that cannot be reduced to any single civilizational narrative.

We conclude with the words of Delambre, the author of the history of astronomy:

"If you count two or three observers among the Greeks, and then look at the Arabs, you will find a large number of observers among them" [Al-Rafei,1979].

It is therefore not fitting for a scholar to state a fact out of bias for a particular race, as true science and the love of truth are inseparable. Regardless of the assessment of the Greeks' share in the mathematical heritage, the undeniable truth is that they borrowed from the East before the East borrowed from them, and that the people of this East were the ones who entrusted the Europeans with that share, whether large or small, and added to it through refinement and innovation [Al-Akkad,2002].

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