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THE MYTH OF DECLINE: EXPLAINING THE PERSISTENCE OF THE POST-ELEVENTH-CENTURY NARRATIVE IN ISLAMIC SCIENCE

Mohamad Abdalla*

Abstract: This article examines why the long-standing thesis that science in Islamic civilisation entered a general decline after the 11th century persisted in scholarship despite substantial evidence to the contrary. Drawing on a critical historiographical analysis, the study contrasts the conventional decline thesis with Ibn Khaldūn's multi-dimensional account, which recognised that scientific activity could diminish in some regions, migrate to others, and continue to flourish elsewhere. To explain the persistence of the decline thesis, the article draws on Thomas Kuhn's concept of paradigm persistence and Edward Said's analysis of Orientalism. It identifies two interconnected sets of factors: procedural weaknesses in scholarly practice, including inadequate engagement with primary sources, poor integration of findings, inconsistent terminology, and insufficient criticism of foundational assumptions; and social-psychological and epistemological factors associated with Orientalist representations of Islamic civilisation. This article argues that the decline thesis reflects less a straightforward description of historical reality than a deeply embedded scholarly construction whose persistence requires explanation in its own right. Reassessing this paradigm is essential to developing a more nuanced understanding of the historical trajectories of Islamic science.

Keywords: *Islamic science, decline thesis, Ibn Khaldūn, Orientalism, Thomas Kuhn, historiography*

INTRODUCTION

Over the past few decades, the scientific legacy of Islamic civilisation has become a major focus of historical enquiry. Historians of what is variously termed "Islamic" or "Arabic" science[1] have demonstrated that, from the 8th to the 16th centuries, scholars working across the

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1 Here I refer to the exact sciences as opposed to the metaphysical ones. Exact sciences include mathematics, astronomy, optics, mechanics, and sometimes medicine, where reasoning and quantification dominate. For

Islamic civilisation produced a substantial corpus of original and methodologically sophisticated scientific work in mathematics, optics, mechanics, medicine, astronomy, and related fields.[2] Some of these achievements predate comparable developments in the Latin West and, in several cases, contributed to later European scientific developments. A striking example emerged in the late 1950s when Edward Kennedy and his students at the American University of Beirut uncovered an important work by the 14th century astronomer Ibn al-Shāṭir (d. 1375).[3] Their analysis revealed striking mathematical correspondences between Ibn al-Shāṭir's planetary models and mechanisms later employed by Nicolaus Copernicus (1473–1543), raising important questions about possible connections between late Islamic astronomy and Copernican astronomy,[4] which may have played a key role in the Copernican revolution.[5]

This discovery catalysed an unprecedented expansion of research on Islamic science from the mid-20th century onwards. Recent studies illustrate that Islamic civilisation's contribution to scientific knowledge was even richer and more profound than previously recognised. Islamic science was important for the rise of the 12th century Renaissance in Europe and may have played a significant role in the development of the exact sciences during the 16th century Renaissance.[6] In fact, Islamic civilisation's contribution in the exact sciences continued well into the 19th century, and abundant source material remains in the form of unpublished manuscripts in Arabic, Persian, and other languages held in libraries across the world.[7] But, "because important sources have not been identified and studied," there exists no "reliable survey of the entire field."[8]

A major preoccupation of modern scholarship has been to understand what happened to this remarkable scientific enterprise after the so-called golden age of the 11th century and why its trajectory apparently changed. In seeking to answer *what* happened, the "classical narrative"[9] contends that the trajectory of Islamic science has two broad phases: a golden age followed by

detailed explanation about the meaning of 'Islamic' and 'Arabic' science, see George Saliba, *Islamic Science and the Making of the European Renaissance* (MIT Press, 2007), vii–ix.

2 Owen Gingerich, "Islamic Astronomy," *Scientific American* 254, no. 4 (1986): 74.

3 Saliba, *Islamic Science*, 74.

4 George Saliba, "Greek Astronomy and the Medieval Arabic Tradition," *American Scientist* 90 (2002): 360.

5 Ibid.

6 More recently, historian of Islamic science George Saliba has demonstrated that one of Copernicus' Muslim contemporaries, Shams al-Dīn al-Khafrī (fl. 1525), was an extraordinarily brilliant astronomer, whose ability to work with the mathematics of his time is unsurpassed. Saliba argues that al-Khafrī's mathematical proficiency exceeded that of Copernicus, further underscoring the sophistication and vitality of scientific enquiry within late medieval Islamic civilisation. George Saliba, "Greek Astronomy," 360.

7 Jan Hogendijk and Abdelhamid Sabra, eds., *The Enterprise of Science in Islam: New Perspectives* (The MIT Press, 2003), vii.

8 Ibid.

9 The classical narrative depicts Islamic civilisation as a desert culture that developed scientific thought only through the translation and assimilation of Greek, Sasanian, and Indian knowledge during the Abbasid era, producing a brief "golden age" that merely revived ancient learning rather than creating new science. It claims this flourishing soon ended under the influence of religious orthodoxy, epitomised by al-Ghazālī's *Incoherence of the Philosophers*, and thereafter, Europe no longer needed Arabic science. In this view, the European Renaissance deliberately bypassed the Islamic intellectual tradition, "appropriating" once more from the Greco-Roman heritage to reclaim what was seen as the original and superior source of scientific and philosophical thought.

a period of "decline."[10] This binary framework has long dominated conventional Western (or more precisely Orientalist) narratives about the development, and eventual decline, of scientific activity in Islamic civilisation. This periodisation typically begins with the assumption that after the 8th–9th centuries translation movement that assimilated earlier scientific knowledge, Arabic-speaking scholars entered a period of original enquiry and innovation, often termed the Islamic Golden Age, lasting from the late 9th to the late 11th centuries.[11] This was then followed by the age of "decline,"[12] which was uniform across the vast Islamic civilisation, stretched across three continents, spanned a vast and diverse region, from the Iberian Peninsula in the west to the Indus Valley in the east, and encompassed multiple cultures, languages, and intellectual traditions.[13]

The "decline" theory has consistently prompted questions about *why* the decline occurred and *what* factors contributed to it.[14] However, such questions become problematic if they presuppose a general decline that the historical evidence does not sustain. Substantial evidence points to continued scientific activity, and in some fields significant growth, in Islamic civilisation well beyond the 11th century.[15] Yet, the decline thesis persisted in the works of many past and contemporary Western scholars, such as Ernest Renan (1823–1892),[16] Max Weber (1864–1920),[17] George Sarton (1884–1956),[18] Max Meyerhof (1874–1945),[19] Toby Huff,[20] Ahmad Al-Hassan,[21] and James McClellan III and Harold Dorn.[22] Therefore, the more pertinent question is: *why* did the decline thesis persist for so long despite substantial evidence that complicated or contradicted it? The theory's persistence requires explanation. While considerable scholarship has investigated the achievements of Islamic science and challenged the chronology and causes of its supposed decline, comparatively little attention has been devoted to explaining *how* the decline thesis acquired and retained scholarly authority despite significant counterevidence.

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10 George Saliba, *The Origin and Development of Arabic Scientific Thought* [Arabic] (Balamand University, 1998), 164.

11 Ibid.

12 Saliba, *The Origin and Development of Arabic Scientific Thought*, 164.

13 Major intellectual centres included Baghdad, Córdoba, Damascus, Cairo, Nishapur, Isfahan, and Bukhara.

14 Ahmed Al-Andalusi, "The Rise and Decline of Scientific Productivity in the Islamic World," *Islam and Civilisational Renewal* 6, no. 3 (2015), https://icrjournal.org/index.php/icr/article/view/333/319; Abdelhamid I. Sabra, "The Appropriation and Subsequent Naturalization of Greek Science in Medieval Islam: A Preliminary Statement," *History of Science* 25, no. 68 (1987).

15 Saliba, *Islamic Science*; Hogendijk and Sabra, *The Enterprise of Science in Islam*.

16 Toby Huff, *The Rise of Early Modern Science* (Cambridge University Press, 1993), 53.

17 In Pervez Hoodbhoy, *Islam and Science: Religious Orthodoxy and the Battle for Rationality* (Zed Books, 1992), 2.

18 George Sarton, *History of Science* (Krieger, 1927).

19 Max Meyerhof, "Science and Medicine," in *The Legacy of Islam*, ed. Thomas Arnold and Alfred Guillaume (The Clarenda Press, 1931), 337.

20 Huff, *The Rise of Early Modern Science*.

21 Ahmad Al-Hassan, "Factors Behind the Decline of Islamic Science after the Sixteenth Century," in *Islam and the Challenge of Modernity: Historical and Contemporary Contexts*, ed. Sharifah Shifa Al-Attas (International Institute of Islamic Thought and Civilisation, 1996).

22 James McClellan III and Harold Dorn, *Science and Technology in World History* (The Johns Hopkins University Press, 1999).

This article builds on, but moves beyond, my earlier work on the historical inadequacy of the decline thesis and on Ibn Khaldūn's (1332–1406) analysis of the fate of Islamic science. I demonstrated that Ibn Khaldūn had already offered a multi-dimensional explanation in which scientific activity could diminish in one region, migrate to another, and continue to flourish elsewhere.[23] The present study asks a different question. Rather than primarily establishing whether a uniform decline occurred, it examines *why* a reductive decline paradigm persisted within scholarship despite historical evidence and alternative explanatory models that called it into question. Its contribution therefore lies in shifting the analysis from the historical problem of decline to the historiographical and sociological problem of the persistence of the decline thesis.

This article employs a critical historiographical analysis of representative scholarship on the fate of Islamic science. It examines the assumptions, terminology, evidentiary practices, and explanatory strategies employed by influential proponents of the decline thesis and reads these against Ibn Khaldūn's account and subsequent historical research demonstrating more complex trajectories of scientific activity. Analytically, the study distinguishes between two interconnected sets of factors: procedural weaknesses within scholarly practice, including inadequate engagement with primary sources, weak integration of findings, inconsistent terminology, and insufficient criticism of foundational assumptions, and social-psychological and epistemological factors, particularly those associated with Orientalist representations of Islamic civilisation.

To explain how these factors operated together, the article draws principally on Thomas Kuhn's account of paradigm persistence[24] and Edward Said's analysis of Orientalism as a structure of knowledge and representation.[25] Kuhn helps explain how an established scholarly paradigm can survive the appearance of anomalous evidence, while Said illuminates the wider intellectual framework within which the assumptions about Islamic civilisation became plausible and authoritative. Viewed through these complementary lenses, the persistence of the decline thesis becomes more intelligible: it was sustained not simply by an absence of evidence, but through established scholarly practices and interpretative assumptions that shaped how available evidence was selected, understood, and incorporated.

THE "DECLINE" THEORY: A CONTEXTUAL BACKGROUND

The notion that the exact sciences declined after the 11th century became a widely accepted feature of the historiography of Islamic science. Yet the literature reveals little agreement about the nature and timing of this supposed decline.[26] Scholars have variously described the fate of Islamic science in terms of "decline," "decadence," "stagnation," "fragmentation," "standstill,"

23 Mohamad Abdalla, *Islamic Science: The Myth of the Decline Theory* (VDM Verlag, 2008); Mohamad Abdalla, "Ibn Khaldūn on the Fate of Islamic Science after the 11th Century," *Journal of Islam & Science* 5, no. 1 (2007).

24 Thomas Kuhn, *The Structure of Scientific Revolutions*, 2nd ed. (University of Chicago Press, 1970).

25 Edward Said, *Orientalism* (Vintage Books, 1979).

26 Abdalla, "Ibn Khaldūn on the Fate of Islamic Science."

and even as having "frozen."[27] Such terminology frequently frames post-11th century Islamic science in reductive terms, implying diminishing originality and marginalising its place within the broader history of science. The "decline" theory is the most repeated narrative, carrying several explanations.

A growing body of scholarship challenges the assumption of a single and uniform decline. Saliba, for example, argues that the common attribution of scientific decline to al-Ghazālī (d. 1111) or to religious opposition is inconsistent with evidence of continuing and, in some fields and regions, flourishing scientific activity for centuries thereafter. Surviving works demonstrate significant developments in astronomy, mathematics, mechanics, optics, pharmacology, and medicine well beyond the 11th century.[28]

Three considerations are important. First, the geographical extent and diversity of Islamic civilisation make it difficult to assign a single starting point to any supposed decline. Second, contraction in one scientific discipline or region could coincide with continuity or advancement in another. Third, the surviving evidence remains incomplete, making sweeping civilisational conclusions methodologically hazardous. The central problem, therefore, is not whether particular scientific traditions experienced periods of decline, which they potentially could have, but whether these differentiated historical trajectories justify the generalised theory of a post-11th century decline of Islamic science.[29]

THE ORIGIN OF THE DECLINE THEORY

The notion that Islamic science experienced a sharp and uniform decline after an early "golden age" has long been shaped, and, in many ways, constrained, by Orientalist scholarship. In my detailed work, I argue that several influential European intellectuals advanced explanations that reflected the racial, cultural, and epistemological assumptions of their time.[30] For example, French Orientalist Joseph Ernest Renan's (1823–1892) 1883 lecture *L'Islamisme et la science* ("Islam and Science")[31] presents a classic European Orientalist argument about the decline of science within Islamic civilisation, framed as a contrast between a rational, progressive West and a stagnant, dogmatic East. Renan argues that Islam, as a religion and social system, was fundamentally antithetical to scientific enquiry and hostile to rationalism. He acknowledges that between the 8th and 13th centuries, Muslim lands produced great philosophers and scientists but insists this brief "flourishing" was due to Persian, Christian, and Greek influences, not Islam. According to Renan, once Islam became doctrinally unified and politically dominant (after the 13th century), it "always harassed science and philosophy. It

27 Abdalla, *Islamic Science*.
28 Saliba, *Islamic Science*, 20–21.
29 Al-Andalusi, "The Rise and Decline of Scientific Productivity"; Rebecca Solomon, "Arabic Science in Decline? Evidence from Counting Manuscripts" (MA thesis, University of Chicago, 2022), https://knowledge.uchicago.edu/record/4200/files/Thesis_Draft2.pdf; Abdalla, "Ibn Khaldūn on the Fate of Islamic Science."
30 Abdalla, *Islamic Science.*
31 Ernest Renan, *Islam and Science*, trans. Sally Ragep (McGill University, 2011), https://www.mcgill.ca/islamicstudies/files/islamicstudies/renan_islamism_cversion.pdf.

finished by stifling them"[32] replacing free enquiry with religious orthodoxy and dogmatism.[33] He claims that Islamic theology's fusion of religion and state crushed intellectual freedom, leading to "marked inferiority"[34] and permanent decline. Renan concludes that, while early Islamic rulers temporarily tolerated philosophy, Islam ultimately "killed science and philosophy in its midst,"[35] making Muslim societies incapable of progress.[36] His view reflects a 19th century Eurocentric assumption that rational modernity could only emerge in the West, once freed from religion's grip.

Max Weber, whose sociological theory profoundly shaped modern social science, reinforced this narrative by claiming that Arabs were intellectually inferior to Europeans, whom he believed were "genetically endowed" with greater rationality.[37] Even George Sarton, who is often regarded as the founding father of the History of Science, framed Islamic scientific achievement as a brilliant but ultimately limited phase. He maintained that the decline began in the 11th century and stemmed from the supposed inability of Eastern peoples to discover or use the experimental method, an achievement he attributed exclusively to the West.[38] Max Meyerhof advanced an influential variant of the decline thesis by locating the downturn of Islamic science around 1100, attributing its onset principally to the intellectual influence of Imām al-Ghazālī.[39] According to Meyerhof, by the 12th century, scientific activity had effectively reached a "standstill." He further argued that, from the 14th century onward, Islamic medical literature visibly deteriorated as "magic and superstitious practices" infiltrated scholarly writing, and other scientific fields likewise continued to produce works, but with a distinctly "marked" decline in their overall quality.[40] Gustave von Grunebaum (1909–1972), who is noted for his studies on broad cultural patterns in Islamic history, attributed the decline of Islam to what he saw as the rigidity of its sacred law and its inability to adapt to new social conditions.[41] He claimed a "steady decay" had begun "as early as the ninth century," and that by the mid-10th century Baghdad's central authority had collapsed "beyond repair."[42] He likewise implied hostility from orthodox scholars toward scientists.[43] The theory of decline

32 Ibid., 8.
33 Ibid., 11.
34 Ibid., 3.
35 Ibid., 7.
36 Ibid., 8.
37 Max Miller et al., *Max Weber* (Thomas Crowell Company, 1963), 1.
38 Sarton, *History of Science*.
39 Meyerhof, "Science and Medicine."
40 Ibid., 337.
41 Bryan Turner, *Orientalism, Postmodernism, and Globalism* (Routledge, 1994), https://doi.org/10.4324/9780203427255.
42 Ibid.
43 Ibid.

continued unabated into the works of more recent scholars such as Phillip Hitti,[44] David Lindberg,[45] Toby Huff,[46] James McClellan III and Harold Dorn,[47] and Chaney.[48]

These interpretations show that the decline thesis developed within intellectual contexts shaped by racial theories, civilisational hierarchies, assumptions about religion and rationality, and Eurocentric conceptions of scientific progress. Despite important differences among these scholars, their accounts tended to interpret the history of Islamic science through a common framework of early flourishing followed by stagnation, deterioration, or decline. In doing so, they frequently compressed complex chronological, regional, and disciplinary developments into a single civilisational trajectory. The persistence of this interpretative pattern is significant given the growing body of evidence demonstrating scientific continuity and innovation well beyond the 11th century.

IBN KHALDŪN'S MULTI-DIMENSIONAL THEORY

Long before modern historians began questioning the decline thesis, Ibn Khaldūn offered a markedly different account of the changing fortunes of scientific activity across the Islamic world. Rather than proposing a single civilisational trajectory, he connected the cultivation of science and scientific instruction to broader political, social, economic, and urban conditions. His analysis is significant because it recognised that each region could experience different scientific trajectories at the same historical moment.

Recent scholarship increasingly supports the need for a differentiated approach. Al-Andalusi, for example, rejects a simple linear model of decline and emphasises cyclical and context-dependent shifts in scientific productivity associated with political instability, economic contraction, and changing patterns of patronage.[49] Solomon's quantitative analysis of Arabic scientific manuscript catalogues likewise points to gradual rather than abrupt change after the 13th century, with important disciplinary and regional variations.[50] Lucas similarly challenges the classical narrative of a "Golden Age" followed by decline, drawing attention to sustained scientific activity into the late medieval and early modern periods.[51]

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44 Phillip Hitti, *The Arabs: A Short History*, 5th ed. (Macmillan, 1968), 117; Phillip Hitti, *Islam: A Way of Life* (Oxford University Press, 1970).

45 David Lindberg, *The Beginning of Western Science: The European Scientific Tradition in Philosophical, religious, and institutional Context, 600 B.C. to A.D. 1450* (The University Chicago Press, 1992), 180–82.

46 Huff, *The Rise of Early Modern Science*.

47 McClellan III and Dorn, *Science and Technology in World History*.

48 Eric Chaney, "Religion and the Rise and Fall of Islamic Science," working paper (Harvard University, 2016), https://scholar.harvard.edu/files/chaney/files/paper.pdf.

49 Al-Andalusi, "The Rise and Decline of Scientific Productivity."

50 Solomon, *Arabic Science in Decline?*

51 Adam Lucas, "Re-Evaluating the Development of the Islamic Sciences: The Case Against the Classical Narrative and the Myth of Decline," *Unisia* 42 (2024), https://doi.org/10.20885/unisia.vol42.iss1.art3; Saliba, *Islamic Science*; George Saliba, "Arabic Science Historian George Saliba Rejects Common Explanations of Decline of Science in Islamic World," video brief, *Columbia News*, July 1, 2002, http://www.columbia.edu/cu/news/media/02/georgeSaliba/; Saliba, *The Origin and Development of Arabic Scientific Thought*, 14, 163–89, 190; Aydin Sayili, *The Observatory in Islam and its Place in the General History of the Observatory* (Türk Tarih Kurumu Basimevi, 1960); Sabra, "The Appropriation and

In my earlier work, I drew attention to the significance of Ibn Khaldūn's account for reassessing the decline thesis.[52] In the *Muqaddimah* (*Prolegomena*), Ibn Khaldūn argued that scientific instruction and activity declined in the Maghrib and al-Andalus because of political fragmentation and social ruin; he also observed that in major centres such as Baghdad, Basra, and Kufa, scientific activity disappeared but was subsequently transplanted to other, more flourishing regions of the Islamic world. At the same time, he emphasised that the sciences continued to prosper in places such as Egypt, where civilisation and sedentary culture remained strong. Ibn Khaldūn thus offered a differentiated, regionally grounded account in which scientific activity could decline in some areas, migrate from others, and continue to thrive elsewhere. Although not exhaustive, this analysis is foundational and should inform any serious scholarly discussion of the historical fate of Islamic science.[53] Despite the explanatory power of Ibn Khaldūn's analysis, as I demonstrated, its capacity to reshape dominant narratives about the fate of Islamic science was long constrained by the limited circulation, delayed translation, and uneven reception of his work beyond the Islamic world. As a result, many later discussions of Islamic science developed in relative isolation from the framework that most directly challenges a singular and uniform account of decline.

Ibn Khaldūn remained virtually unknown outside the Islamic world until 1636, with the first European bibliography entry on him appearing in d'Herbelot's *Bibliothèque Orientale* in 1697.[54] Although Arabic manuscripts of the *Muqaddimah* were held in major libraries, such as the Bibliothèque Nationale in Paris, it was not translated for another two centuries. William Slane produced the first French translation in 1862, followed by Vincent Monteil's in 1967. The first complete English translation was by Franz Rosenthal in 1958, alongside an abridged English version by Nessim Dawood in 1967.[55] A Portuguese translation by José Khoury and Angelina Bierrenbach-Khoury also appeared in 1958.[56] Given the significance of Ibn Khaldūn's contribution, and the fact his work was known and nominally accessible in Europe from as early as 1636, one might reasonably expect subsequent scholarly discussions to have engaged with his insights and built on them to develop a more accurate and comprehensive account of what happened to Islamic science. In practice, however, this did not occur. Instead, Ibn Khaldūn's theory was marginalised, selectively invoked, or misunderstood within much of Orientalist scholarship, with little sustained effort to grapple with the full implications of his analysis.

Few Orientalist scholars engaged with Ibn Khaldūn's theory, and when they did, they often failed to capture it accurately. For example, von Grunebaum misrepresents, or at least fundamentally misconstrues, Ibn Khaldūn's observations on the fate of Islamic science. He

Subsequent Naturalization of Greek Science in Medieval Islam"; Al-Hassan, "Factors Behind the Decline of Islamic Science."

52 Abdalla, *Islamic Science*; Abdalla, "Ibn Khaldūn on the Fate of Islamic Science."

53 Abdalla, "Ibn Khaldūn on the Fate of Islamic Science."

54 Abdel Al-Araki, "Ibn Khaldun: Discourse of the Method and Concepts of Economic Sociology" (University of Oslo, 1983), http://home.hio.no/~araki/arabase/ibn/khald201.html.

55 Ibid.

56 Ibid.

claims that Ibn Khaldūn was "keenly conscious of the cultural decline of the period,"[57] and summarises Ibn Khaldūn's view as asserting that scientific knowledge and activity had become extinct in the Muslim West. This reverses Ibn Khaldūn's argument: Ibn Khaldūn clearly states that scientific activity in some geographical regions ceased *because* the Muslim West fell into political and social ruin,[58] not that civilisation collapsed due to the extinction of science. Von Grunebaum distorts Ibn Khaldūn by suggesting that the remaining practitioners of science were forced to evade "the surveillance of the orthodox doctors,"[59] implying antagonism from religious scholars. Ibn Khaldūn, however, only notes that the remnants of scientific learning were found among scattered individuals "controlled by the orthodox scholars,"[60] which may indicate a protective rather than hostile relationship, especially in distinguishing true science from occult practices. His representation is also incomplete and inaccurate when describing regional differences. Von Grunebaum states that Ibn Khaldūn found the situation "slightly more encouraging"[61] in southern Persia, Transoxania, and Egypt, yet he ignores Ibn Khaldūn's explicit observation that science flourished in Cairo because its civilisation remained strong. He also omits Ibn Khaldūn's crucial point that scientific activity had disappeared from Baghdad, al-Qayrawān, Basra, and Kufa, and was subsequently transplanted to other thriving regions. In the end, von Grunebaum presents a thesis suggesting that Islamic science was minimal and ultimately stagnated "in self-inflicted sterility."[62] Despite his awareness of Ibn Khaldūn's nuanced, multi-regional account, he offers little intellectual development beyond earlier Orientalist narratives and repeats a failure-centred interpretation that the available evidence, including Ibn Khaldūn's analysis, does not support.[63]

THEORETICAL FRAMEWORK: PARADIGM PERSISTENCE AND ORIENTALIST KNOWLEDGE

The persistence of the decline thesis can be better understood by situating it within the sociology of knowledge and historiography of science. Thomas Kuhn's concept of the scientific paradigm provides a useful analytical framework for understanding how established interpretations can retain authority even when confronted by evidence that does not fit comfortably within them. For Kuhn, scholarly enquiry does not proceed simply through the continuous accumulation of neutral facts. Research is conducted within paradigms that shape the questions scholars consider important, the assumptions they regard as legitimate, and the evidence they consider relevant. Evidence that conflicts with an established paradigm does not necessarily result in its immediate abandonment; anomalies may instead be marginalised,

57 Gustave von Grunebaum, *Medieval Islam: A Study in Cultural Orientation* (University of Chicago Press, 1946), 339.
58 Ibn Khaldun, *The Muqaddimah: An Introduction to History*, trans. Franz Rosenthal (Pantheon Books, 1958), vol. 2, 427.
59 Ibid.
60 Ibid., vol. 3, 117.
61 Von Grunebaum, *Medieval Islam*, 339.
62 Ibid., 322.
63 Abdalla, *Islamic Science.*

reinterpreted, or accommodated within the prevailing framework.[64] Although Kuhn developed the concept of paradigms primarily to explain change within scientific communities, the concept is employed here more broadly as a heuristic for understanding the persistence of an established historiographical framework.

This insight is relevant to the historiography of Islamic science. Once the "Golden Age–decline" model became established, the central scholarly question was generally framed not as whether Islamic science had declined, but why it had declined. The assumption of decline thus functioned as a foundational premise around which subsequent explanations were organised. Evidence of significant scientific activity after the 11th century could consequently be acknowledged without necessarily producing a corresponding reconsideration of the paradigm. The persistence of the decline thesis despite such evidence can therefore be understood, at least partly, as a case of paradigm persistence in which anomalies accumulated without immediately displacing the interpretative framework through which they were understood.

Kuhn's framework, however, does not explain why the decline paradigm took the form that it did. Here Edward Said's analysis of Orientalism provides an important complementary perspective. Orientalism describes not merely inaccurate representations of the East but a wider structure of knowledge through which the Orient was constructed in relation to a supposedly rational, progressive, and intellectually superior West. Within such an epistemological framework, representations of Islamic civilisation as derivative, stagnant, or declining acquired a degree of plausibility independent of the complexity of the historical record. The decline of Islamic science could therefore appear not simply as a historical hypothesis requiring verification, but as consistent with a broader conception of the historical relationship between "Islam" and "the West."

Kuhn and Said illuminate two interconnected dimensions of the problem. Kuhn helps explain the mechanism through which an established scholarly paradigm could resist contradictory evidence, while Said helps explain the historical and epistemological conditions that made this paradigm persuasive and durable. This combined framework does not imply that every scholar who employed the language of decline consciously subscribed to Orientalist assumptions, nor that evidence of decline in particular disciplines, periods, or regions should be dismissed. Rather, it provides a framework for examining why a generalised decline thesis remained authoritative even when the historical evidence increasingly pointed toward differentiated trajectories of contraction, migration, continuity, and flourishing.

Ibn Khaldūn is significant within this framework because his account constitutes an early alternative to the assumptions underlying the later decline paradigm. Rather than describing a single civilisational trajectory, he connected scientific activity to changing political, social, economic, and urban conditions and recognised that science could diminish in one region while being transplanted to or flourishing in another. The limited integration of this multi-dimensional account into later historiography therefore provides an important case through

64 Kuhn, *The Structure of Scientific Revolutions*.

which to examine how established paradigms determine which evidence and explanatory possibilities are incorporated, marginalised, or overlooked.

POSSIBLE REASONS FOR PERSISTENCE OF THE DECLINE THEORY

Viewed through this theoretical framework, the persistence of the decline thesis cannot be explained simply by a lack of historical evidence. Ibn Khaldūn's analysis already provided a differentiated alternative to a uniform model of decline, while substantial evidence of continued scientific activity after the 11th century became increasingly available from the mid-20th century onward. The question, therefore, is not merely why earlier scholars reached inadequate conclusions, but why those conclusions retained authority despite accumulating grounds for revision.

Two interconnected sets of factors are proposed here. The first concerns procedural weaknesses in scholarly practice, including insufficient engagement with primary sources, inadequate integration and communication of findings, inconsistent analytical terminology, and limited criticism of foundational assumptions. The second concerns social-psychological and epistemological factors, particularly the Orientalist framework within which Islamic civilisation was frequently represented and evaluated. Together, these factors help explain how the decline thesis could persist as an established paradigm even as evidence increasingly complicated its foundational assumptions.

Procedural Factors

By procedural factors, this study refers to shortcomings in the methods and norms of scholarly enquiry, including inadequate engagement with primary sources, limited cross-criticism, and poor integration of findings, that hinder the correction of faulty theories. Robust scholarship requires claims and assumptions to be tested against available evidence; when this does not occur, inherited interpretations can acquire authority through repetition and apparent plausibility. As Hamilton observes, a fundamental methodological problem is the failure to verify claims against original sources, which can lead scholars to assume that earlier evidence is reliable and has been accurately transmitted.[65] This problem is evident in the treatment of Ibn Khaldūn. Although he articulated a sophisticated, multi-dimensional account of the fate of scientific activity, scholars such as Sarton[66] and Huff[67] showed little awareness of his analysis or did not integrate it into their accounts. While the *Muqaddimah* initially had limited circulation in Europe, it became progressively more accessible from the 17th century onward and especially through 19th and 20th century translations. Its continued marginalisation in later scholarship therefore requires explanation beyond simple lack of access.[68]

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65 Richard Hamilton, *The Social Misconstruction of Reality: Validity and Verification in the Scholarly Community* (Yale University Press, 1996), 8.
66 Sarton, *History of Science*.
67 Huff, *The Rise of Early Modern Science*.
68 Abdalla, *Islamic Science*.

The problem is evident in von Grunebaum's work, who was aware of Ibn Khaldūn's analysis but did not engage adequately with its implications, instead retaining a broad and largely one-dimensional account of decline. As Hamilton notes, failure to engage critically with original evidence can encourage the uncritical transmission of established interpretations.[69] In the historiography of Islamic science, inherited assumptions and scholarly consensus sometimes appear to have carried greater weight than evidence that complicated them. Rather than first testing whether a general decline had occurred, scholars frequently accepted decline as the foundational premise and concentrated on explaining its causes. The resulting problem was therefore not simply insufficient evidence, but inadequate scrutiny of the assumptions through which that evidence was interpreted, a pattern that helps explain how the decline thesis could persist despite significant grounds for its reconsideration.

Another fundamental weakness in the scholarship concerns the failure of effective communication and integration of findings. In a well-functioning scholarly community, researchers not only recognise what is worth communicating, but also understand how to present their findings in ways that allow others to evaluate, challenge, and build on them using shared conventions of language, evidence, and reasoning. Clear written communication preserves insights for future scholarship, while integration, the process of drawing findings together and interpreting them in relation to one another, enables the development of more coherent and cumulative understandings. Where such communication and integration are absent, valuable insights remain isolated, conceptual clarity is lost, and the field is deprived of the opportunity to generate deeper explanatory frameworks.[70] In this respect, much of the scholarship on the fate of Islamic science has fallen short of these basic scholarly requirements.

A clear example of the failure of communication and integration is the inconsistent use of analytical terminology to describe what happened to Islamic science. Scholars frequently employed mutually incompatible concepts, such as "frozen" and "decayed," conditions that cannot logically coexist, or relied on overlapping terms like "standstill," "frozen," and "ceased," all of which describe essentially the same state. Others treated analytically distinct notions, such as "decline" and "decadence," as interchangeable. This lack of terminological discipline produced a fragmented and often confusing body of descriptions that hindered meaningful comparison and cumulative analysis. Because conceptual language shapes how historical phenomena are perceived and interpreted, imprecise or conflicting terminology does not merely reflect confusion; it actively undermines the integrity and explanatory power of the scholarship.[71]

Weaknesses in research practice and scholarly communication that allowed Ibn Khaldūn's analysis to be marginalised also facilitated the uncritical acceptance of earlier interpretations, particularly the decline thesis. In the absence of sustained debate and integrative engagement, claims were often inherited rather than interrogated, sometimes through inadvertent oversight,

69 Hamilton, *The Social Misconstruction of Reality*, 17.
70 Charles Glassick et al., *Scholarship Assessed: Evaluation of the Professoriate* (Jossey-Bass Publishers, 1997), 9.
71 Abdalla, *Islamic Science*.

and at other times because long-standing assumptions appeared intuitively plausible. The endurance of the decline thesis reflects this pattern of what may be described as "uncritical critics,"[72] where successive generations of scholars treated decline as an established historical fact despite significant empirical evidence that complicated such a generalised interpretation. Over time, the decline thesis assumed the character of a socially constructed narrative, reproduced through repetition rather than systematic investigation. This persistent failure to revisit first principles allowed unsupported claims about decline to acquire authority through surface plausibility and continual reaffirmation, rather than through rigorous historical enquiry.

Orientalist and Epistemological Factors

The persistence of the decline thesis can also be understood in relation to Orientalist and epistemological assumptions that shaped scholarly judgment. Among these were the presumption that Islamic science was inherently inferior to its Western counterpart and the tendency to treat Islamic scientific activity primarily as a precursor to Western scientific advancement rather than as a historical tradition worthy of analysis. Such assumptions were embedded within broader intellectual frameworks through which the Islamic world was perceived and interpreted. As Said argues, Orientalist knowledge frequently constructed Europe as rational, progressive, and culturally superior in contrast to an Orient represented as passive, static, and inferior.[73] Within this framework, interpretations of Islamic science were inevitably influenced by wider assumptions about the relationship between Islam, rationality, and historical progress.

In the historiography of Islamic science, these assumptions contributed to a narrative of early flourishing followed by decay, retreat, or decadence.[74] Some historical accounts portrayed Islamic/Arabic science primarily as a repository of Greek learning, an interpretation that obscured its original contributions to scientific knowledge.[75] The implication was that Muslim scholars preserved but did not substantially transform or extend the Greek scientific heritage, whose "true" fulfilment was located in 15th and 16th century Europe.[76] Reproduced across generations of scholarship, this framework made the decline thesis appear consistent with a broader understanding of civilisational development. In this sense, Orientalism helps explain why the decline paradigm was historically plausible and durable: evidence was interpreted within an epistemological framework that already positioned Western science as the normative trajectory against which Islamic scientific activity was assessed.

Ernest Renan represents an influential example of a scholar who explicitly asserted the decline of Islamic science. He portrayed Islamic civilisation as one whose finest intellectual era lay irrevocably in the past and, more critically, as a culture inherently incapable of

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72 Hamilton, *The Social Misconstruction of Reality*, 27.
73 Said, *Orientalism*.
74 Turner, *Orientalism, Postmodernism, and Globalism*, 67.
75 Roshdi Rashed & Morelon, R, ed., *Encyclopaedia of the History of Arabic Sciences* (Routledge, 1996), vol. 1, x, xii.
76 Ibid., 46. Also see Saliba, *The Origin and Development of Arabic Scientific Thought*, 164–68.

recovering its former vitality. In his writings on Islam and science, Renan claimed that "the Mussulman [Muslim] has had the most profound disdain for instruction, for science, for everything that constitutes the European spirit."[77] As Bryan Turner observes, Renan maintained that scientific activity in the Islamic world could flourish only when detached from orthodoxy and associated with heresy. On this basis, Renan and other like-minded historians argued that science in Islam was merely parasitic on Greek culture and that Islamic civilisation functioned solely as a conduit transmitting Greek philosophy to Renaissance Europe.[78] From this perspective, any suggestion that Islamic civilisation made an original or substantive contribution to Western intellectual development was forcefully rejected. Renan articulated his claim that Islamic civilisation was fundamentally incompatible with scientific advancement in stark and explicitly essentialist terms. Reflecting a deeply entrenched Orientalist worldview, he asserted:

> Anyone with even the slightest education in matters of our time sees clearly the current inferiority of Muslim countries, the decadence of states governed by Islam, the intellectual sterility of races that derive their culture and education from that religion alone. All who have been to the Orient or to Africa are struck by what is the inevitably narrow-mindedness of a true believer, of that kind of iron ring around his head, making it absolutely closed to science, incapable of learning anything or of opening itself up to any new idea.[79]

This passage is revealing not only for its sweeping generalisations, but also for its conflation of religious belief with intellectual incapacity. Renan's argument rests on the assumption that Islam imposes an inherent cognitive limitation on its adherents, thereby rendering sustained scientific enquiry impossible. Such claims exemplify the social-psychological foundations of the decline thesis, in which cultural and religious essentialism substitutes for historical analysis and empirical evidence.

The Orientalist view that Islamic science merely transmitted Greek learning and subsequently declined due to the presumed inferiority of Muslims vis-à-vis Europeans was reinforced in the works of influential scholars such as Max Weber. Drawing on arguments akin to those advanced by Renan, Weber's scholarship, consistent with broader Orientalist thought, sought to explain what he regarded as the uniquely defining characteristics of the West, most notably the emergence of rational, capitalist modes of production.[80] Within this framework, non-European civilisations were evaluated primarily in terms of their perceived inability to generate similar outcomes. The portrayal of Muslims as mere "torchbearers" of Greek science thus emerges as an Orientalist construct that treats the Orient and its peoples as an object of study marked by Otherness. While claiming to rest on empirical specificity, this typology is abstracted from historical context and rendered essentialist and ahistorical.[81] Operating within such a framework, the scientific contributions of Muslim scholars could be marginalised or interpreted primarily in relation to the subsequent development of Western science. The decline

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77 Quoted in Turner, *Orientalism, Postmodernism, and Globalism*, 30.
78 Ibid., 31.
79 Renan, *Islam and Science*, 2.
80 Turner, *Orientalism, Postmodernism, and Globalism,* 39.
81 Rashed, *Encyclopaedia of the History of Arabic Sciences.*

thesis thereby acquired further plausibility within a historiographical paradigm that treated the Western scientific trajectory as the principal measure of scientific advancement.

Another limitation of Orientalism lies in its reliance on comparative frameworks grounded in the presumed inferiority of non-Western cultures. John Saunders' (1910–1972) decadence thesis exemplifies this tendency.[82] His analysis treats Islamic science largely as a backdrop against which Western development is assessed, resulting in a continual comparison in which Islamic civilisation is measured primarily by its perceived failure to replicate Western achievements. From the outset, Saunders equates the so-called "decline" of Islam with its slipping behind the West, thereby conflating historical difference with deficiency.[83] Proceeding on this basis, Saunders constructs his comparison by drawing heavily on Western authorities such as Hamilton Gibb, Arthur Arberry, and the decay theorist Gustave von Grunebaum, thereby reinforcing an interpretive framework in which Islamic history is explained primarily through Western scholarly categories and evaluative standards. Saunders articulated this culturally essentialist explanation of the supposed decline of Islamic science, attributing the abandonment of scientific enquiry to Islam's alleged rejection of Hellenistic rationalism:

Islam, from the first an essentially religious culture, turned back to its origins; the Hellenic element was gradually extruded; Aristotelian rationalism was repudiated by the Sufis as "veiling the face of God," and profane science, which had always operated on the fringe and had never really cleared itself of the charges of impiety, was quietly abandoned as "un-Islamic." It has been said that "Islam does not reach the stars," as it has none of the insatiable curiosity of the Greeks.[84]

This account rests on a series of unexamined assumptions: that Islamic civilisation was uniformly hostile to rationalism, that Sufism functioned primarily as an anti-intellectual force, and that scientific enquiry remained marginal and religiously suspect throughout Islamic history. By treating these claims as self-evident, Saunders reproduces a core Orientalist trope in which cultural and religious essence substitutes for historical analysis, thereby reinforcing a one-dimensional narrative of scientific decline. This argument implicitly defines the "decline" of Islamic science in comparative terms, measuring it against the developmental trajectory of Western civilisation. Under this framework, Islamic science could continue to generate knowledge yet still be labelled decadent simply because it did not follow the Western path or pace. This mode of comparison, inherited from earlier Western scholars such as Gustave von Grunebaum, raises serious methodological concerns, not least whether Western science should function as the normative standard for evaluating Islamic scientific activity. For these reasons, Saunders' comparative approach is widely regarded as problematic and has been subject to sustained criticism in contemporary scholarship.[85]

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82 John Saunders, "The Problem of Islamic Decadence," *Journal of World History* 7, no. 1 (1962): 701, https://www.proquest.com/scholarly-journals/problem-islamic-decadence/docview/1298905205/se-2.

83 Ibid.

84 Ibid., 719.

85 Turner, *Orientalism, Postmodernism, and Globalism*; Ziauddin Sardar, *Orientalism* (Open University Press, 1999); Ziauddin Sardar et al., *Barbaric Others: A Manifesto on Western Racism* (Pluto Press, 1990);

The broader methodological problem is therefore not comparison, but the normative framework within which comparison was undertaken. When Western scientific development functions as the universal standard, alternative historical trajectories can readily be interpreted as evidence of backwardness or failure.[86] Islamic science consequently becomes an "object" marked by Otherness:[87] derivative, passive, and lacking historical agency,[88] while Western science assumes the status of the normative model against which scientific activity elsewhere is evaluated.[89] Saunders' claim that "the only science which came to be studied in Islam for its own sake was that of medicine,"[90] for example, illustrates how substantial achievements in other scientific fields could be discounted within such a framework. Read alongside Said's analysis of Orientalism, these examples help explain the epistemological conditions that made the decline thesis persuasive; read through Kuhn, they also demonstrate how an established interpretative paradigm could continue to organise historical evidence even as that evidence increasingly complicated its assumptions.

SUMMARY AND CONCLUSION

The aim of this article has been to examine why much of the scholarship seeking to explain the fate of Islamic science after the 11th century has sustained an inadequate and overly generalised account of decline. It has argued that the persistence of this narrative cannot be attributed simply to a lack of historical evidence, but to a constellation of procedural, social-psychological, and epistemological factors operating within the scholarly enterprise. Among the procedural shortcomings were insufficient engagement with primary sources, weak communication and integration of findings, inconsistent analytical terminology, and limited criticism of foundational assumptions. These weaknesses, together with broader Orientalist frameworks through which Islamic civilisation was frequently interpreted, help explain how a generalised decline thesis acquired and retained scholarly authority despite significant evidence that complicated its assumptions.

The contribution of this study therefore extends beyond demonstrating the inadequacy of a uniform decline thesis. Its principal contribution is to explain why that thesis proved so durable despite the availability of historical evidence and alternative interpretations that challenged its foundational assumptions. Viewed through the complementary lenses of Kuhnian paradigm persistence and Saidian Orientalism, the decline thesis emerges not simply as a historical claim requiring reassessment, but as an entrenched historiographical framework capable of accommodating or marginalising contradictory evidence while preserving its central assumptions. Ibn Khaldūn's neglected multi-dimensional account is revealing in this respect:

Said, *Orientalism*; Edward Said, *The World, the Text and the Critic* (Harvard University Press, 1983); Edward Said, *Representation of the Intellectual* (Vintage, 1994).

86 Sardar, *Orientalism*, 4.

87 Abdel-Malek in Sardar, *Orientalism*, 59.

88 Ibid.

89 Ibid.

90 John Saunders, *Muslims and Mongols: Essays Medieval Asia* (Whitcoulls, 1977), 109.

the existence of an alternative explanation did not produce a corresponding change in the dominant paradigm.

The history of Islamic science is therefore better understood not through a binary movement from "Golden Age" to decline, but through differentiated trajectories of flourishing, contraction, continuity, migration, and transformation across disciplines, regions, and historical periods. Recognising these dynamics does not require denying instances of genuine scientific decline. Rather, it requires rejecting the assumption that such instances collectively constitute a single and uniform civilisational trajectory. Reassessing how the decline thesis was constructed, sustained, and reproduced is therefore essential not only for developing a more accurate and nuanced history of Islamic science, but also for understanding how scholarly paradigms acquire and retain authority despite evidence that challenges them.

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