



People's Democratic Republic of Algeria
Ministry of Higher Education and Scientific Research
Dr. Moulay Tahar University, Saida
Faculty of Letters, Languages and Arts
Department of English Language and Literature

The Golden Age of Islam : The Study of Advancement in Art, Science and Culture

**Dissertation submitted as partial fulfilment of the requirements for the degree of
*Master in Literature and Civilization.***

Presented by:

Student: Bouchikhi Saadia

Supervised by:

Dr. SELMI Ahmed Zakaria

Board of Examiners

Dr. BOUGESSMIA

(MCB) Chair Person

University of Saida

Dr. SELMI

(MCB) Supervisor

University of Saida

Dr. MOUSSAOUI

(MCB) Examiner

University of Saida

Academic Year: 2024/2025

Declaration of Originality

I confirm that this thesis has not been previously presented for a degree , I
also confirmed that I am the sole author of this thesis , and have duly
acknowledged any assistance I received in my research work and the
preparation of this thesis .

Date:

Name: Bouchikhi Saadia

Signature:

Dedication

To my beautiful family , cousins and friends your support and encouragement have meant everything for me. To my parents, grandparents, and my endless love brother, thank you for always being my strength, but a special thank you goes to my mom, your strength, your containment, your love was the foundation of everything I achieve today. And finally to a person I really appreciate his words and support have never left my heart

I appreciate everyone believe in me

Acknowledgements

I would like to express my deepest appreciation to my supervisor, Dr. Selmi Zakaria, for his invaluable guidance, expertise, and support throughout this journey. His encouragement have been instrumental in shaping this thesis.

I would like also to thank the respected members of the jury:[Dr Bougeussmia F], [Dr Moussaoui A], for their review my thesis and for their valuable suggestions.

My heartfelt thanks go to everyone helped me or supported me during this path.

Abstract

The aim of this thesis is to shed light on the era that Contributed to the acquisition of the Islamic Golden Age, namely the Abbasid period. Which was known for its openness to culture, science and Epiphany

the main objective of the study is to understand the impact of the Abbasid Caliphate's unique dimension

And delve into the extent of the impact of political stability by studying the historical dimension of the Abbasid period and its role in revitalizing knowledge exchanges. Especially in Baghdad, the centre of science and the elite at that time which made it fertile soil for cultural prosperity, Secondly, the wealth in the field of scientific inventions, cultural waves, and the emergence of thinkers such as Al-Khwarizmi and Ibn Sina. in addition, and perhaps the biggest motivation for achieving this prosperity was the translation movement that spread throughout the House of wisdom where the Persian, Greek and even Indian books were translated into Arabic from here, Civilization was transferred to Europe and appeared in what is known as the Renaissance

Keywords: Abbasid Caliphate, Islamic World, The Golden Age Translation Movement

List of Figures:

Figure 1 : The Islamic Golden Age	8
Figure 2 : the layout of the Abbasid capital of Baghdad from 767 to 912 CE (web 2)	12
Figure 3 : Ancient Greek civilization (web 3)	19
Figure 4 : Persian Empire: Rise, Map (web 4)	22
Figure 5 : Indian civilisation map (web 5)	24
Figure 6 : Al-Khwarizmi (web 6)	27
Figure 7 : the translation movement's map (web 7)	31
Figure 8 : 1.1.1. House of Wisdom (web 8)	33
Figure 9 : : Mathematics in the Islamic world (Knorr, 2025)	42
Figure 10 : Observatories and Instruments (web 9)	44
Figure 11 : Advancements in Medicine During the Islamic Golden Age (web 10)	48
Figure 12 : Islamic Architecture (web 11)	56
Figure 13 : Islamic art (web 12)	58
Figure 14 : Translation in the pre-modern world (Mallet, 2017)	68
Figure 15 : The House of Wisdom	72

Table of Content:

Introduction.....	1
Chapter 1: Historical Context and Intellectual Foundations of the Islamic Golden Age:	5
1.1. Introduction to the Islamic Golden Age:	5
1.2. Overview of the period (8th to 14th century) :.....	5
1.3. Importance of the Abbasid Caliphate and Baghdad as a centre of learning	9
1.4. Historical context : Rise of the Abbasid Caliphate	12
1.5. Intellectual Achievements : The Function of Earlier Civilizations	17
1.6. The Translation Movement: A Catalyst for Intellectual Advancement	29
Chapter 2: Scientific and Cultural Achievements of the Islamic Golden Age :.....	38
Introduction :.....	38
2.1. Scientific Advancements: Mathematics, Astronomy, and Medicine:	38
2.2. Contributions of Al-Khwarizmi, Ibn al-Haytham, Avicenna (Ibn Sina), and Al-Razi.....	50
2.3. Impact on European science during the Renaissance:	53
2.4. Cultural Flourishing: Art, Architecture, and Literature.....	55
2.4. Cross-Cultural Exchanges and Global Influence	60
2.5. Global Impact	62
Conclusion:	64
Chapter 3: The Translation Movement and Its Impact on Knowledge Preservation and Dissemination:	66
Introduction :.....	66
3.1. The Mechanics of the Translation Movement	67
3.2. Role of key Translators and Institutions (e.g., Hunayn ibn Ishaq):	70
3.3. Expansion and preservation of Ancient Knowledge:	73
3.4. Impact on Islamic and European Thought:	76
conclusion	78

Conclusion	80
References.....	81

Introduction

Introduction

The period extending from the eighth to the fourteenth century is known as the Golden Age of Islam, a period of remarkable intellectual, scientific, and cultural developments for the Islamic world. At the heart of this era emerged the Abbasid Caliphate, with Baghdad as an irreplaceable, vibrant centre of learning and innovation. However, questions remain about the distinctive and mature factors that facilitated the flourishing of knowledge and creativity, despite the period's rich heritage.

This dissertation aims to address the problem of understanding how the Islamic Golden Age became a springboard for progress, and what mechanisms facilitated the preservation and dissemination of knowledge across civilizations

Problem Questions:

- How did the breaking of cultural barriers and political liberalization of the Abbasid caliphate, especially in Baghdad, contribute to the intellectual and cultural expansion of that era?
- In what ways did the scientific advancements achieved during this period shape both the Islamic world and global civilization?
- How did the translation movement and institutions such as the House of Wisdom preserve and expand the knowledge of previous civilizations?

Hypotheses:

- The stable environment and unique rules provided by the Abbasid sages created an atmosphere of cooperation that enabled scholars to help each other under a cooperative atmosphere. This transformed Baghdad into a centre of science and knowledge.
- Scientific achievement in various fields, such as astronomy and mathematics, had a deep impression establishing a basis for future innovations in Islamic world and the history of science in general.
- The Translation inspired the original involvement of Muslim Scholars, and it was not limited only to protection of various knowledge, but it also left a mark in other civilization including Europe.

The main objective of this study is to analyse the historical context, scientific advancements, and cultural dynamics that defined the Islamic Golden Age, while also highlighting the processes through which knowledge was transmitted and transformed.

The research follows a chronological and thematic approach: Chapter 1 explores the historical background and intellectual foundations of the era, focusing on the rise of the Abbasids and the influence of earlier civilizations; Chapter 2 delves into the scientific and cultural achievements that characterized the period, from groundbreaking discoveries in mathematics and medicine to the flourishing of the arts; and Chapter 3 addresses the pivotal role of translation movement in preserving and disseminating knowledge, assessing its influence on both the Islamic world and beyond. Through this systematic research, the

thesis aims highlight the enduring importance of the Islamic Golden Age
in shaping the humanity's intellectual heritage.

*Chapter 1: Historical Context
and Intellectual Foundations of the
Islamic Golden Age*

Chapter 1: Historical Context and Intellectual

Foundations of the Islamic Golden Age:

1.1. Introduction to the Islamic Golden Age:

The period extending from 8th to the 14th century is known as The Golden Age of Islam. It was very distinguished in terms of scientific progress, cultural, prosperity, and economic brilliance. The Abbasid Caliphate was integral part of it as a main seat of science and intellectual research, as political factors played an important role in facilitating the rise of the Abbasids. The capital Baghdad established by Al-Mansur in 762 CE underscored the Abbasids' commitment to fostering a multicultural and intellectually rich society. Previous traditions, including Greek, Persian, and Indian, profoundly influenced this era's knowledge, and the translation movement played a role in expanding it. Leading figures and institutions, such as Bayt AL Hikmah, were also involved in fundamental roles in translating classical texts into Arabic, creating the foundation for novel input in fields like mathematics, medicine, and philosophy. This chapter discusses the historical background and intellectual pillars that defined the Islamic Golden Age, showing its significance in building Islamic scholarship and global intellectual heritage.

1.2. Overview of the period (8th to 14th century) :

Muslim scholars played an important role in translating classical books into Arabic, paving the way for original contributions in the fields of medicine and philosophy.

This Chapter is dedicated for a historical overview and contributions of the elite that distinguished the Islamic Golden Age.

Emphasizing its crucial role in forming the Islamic scholarship and global intellectual heritage.

The period from the 8th to 14th century was a transformative era which specialized by profound scientific, economic , and cultural advancement this era closely associated with the Abbasid caliphate during the Harun El Rashid 'reign(786-809) AD who played an important role in establishing the wisdom house in Baghdad , which represent a beacon for the scholars from everywhere attracting them to translate classical knowledge into Arabic and Persian In the cultural framework, the Islamic era witnessed development in various fields of art and architecture in various structural forms such as decoration.

In the cultural framework, the Islamic era witnessed development in various fields of art and architecture in various structural forms such as decoration.

calligraphy, ceramics, and architecture, developing as distinct artistic distinctions. Spectacular buildings, such as the Alhambra and the Dome of the Rock, reflecting a deep connection to the divine. This cultural advancement was not limited to visual arts; but also literature experienced a renaissance, with important poets like Rumi contributing to a vibrant literary tradition that continues to inspire contemporary thoughts (BWH, 2025).

Economically, the Muslim world experienced a period of dominance from the 8th to the 11th centuries. Extensive trade networks stretched from the Atlantic to Central Asia, facilitated by a unified monetary system and the use of Arabic as a common commercial language. This economic prosperity was crucial in supporting the intellectual and cultural achievements of the era.

The strategic location of Baghdad between Europe and Asia made it a crucial hub for cross-cultural exchanges. An important intellectual environment was achieved by scholars from many regions. Intellectual exchange and cultural acceptance played a pivotal role in fostering a period of openness and cooperation that show the Islamic Golden Age (Review of Religions, 2022).

This era was a bombshell in both field of science and culture. However, as we know, like any era, decline and decline are inevitable due to several factors, including the Siege of Baghdad in 1258 and the Mongol invasions. Nevertheless, the influence and legacy of this period persist to this day, highlighting the Islamic world's immense contributions to global civilization (Review of Religions, 2025).



Figure 1 : The Islamic Golden Age

1.3. Importance of the Abbasid Caliphate and Baghdad as a centre of learning:

The Abbasid Caliphate, with Baghdad as its capital, played a major role in establishing the city as a powerful centre of learning during the Islamic Golden Age. This era was marked by tremendous advances in science, philosophy, and culture. The founding of Baghdad by Caliph al-Mansur in 762 AD marked a pivotal turning point in the history of the Islamic world. Thanks to its strategic location between the Tigris and Euphrates rivers, Baghdad became a thriving centre of trade and intellectual exchange, reflecting the Abbasids' appreciation for diverse cultures through its design, which was inspired by Persian and Byzantine architectural styles. The Abbasid rulers actively supported the arts and sciences, creating an environment that fostered intellectual growth. They established institutions like “Bayt al Hikmah” , which attracted scholars from divers places or civilizations to start in translation, research, and innovation (Britannica, 2025).

The Abbasids promoted the translation of ancient texts from Greek, Persian, and Indian languages into Arabic, preserving classical knowledge and facilitating its expansion. This seminal movement contributed to developments in mathematics, medicine, astronomy, and philosophy, charting a solid path and bridge in Islamic sciences, while also influencing European thought during the Renaissance. Baghdad's strategic location made it a meeting place for scholars from across the Muslim world and beyond, attracting geniuses and scientists from diverse cultures, fostering a vibrant exchange of knowledge and scholarship. Baghdad was the home of the House of Wisdom , a pivotal institution in the translation movement and intellectual advancement. The House of Wisdom housed scholars, or

rather intellectual gems, such as Al-Khwarizmi, Al-Razi, and Ibn al Haytham, who made significant contributions to various fields during their tenure. The city's status as a scientific and cultural centre was further demonstrated by its architectural achievements, the development of unique Islamic art forms such as Arabic calligraphy and like the Great Mosque of Samarra, and the development of special Islamic art forms such as Arabic calligraphy. As a result of this efforts, Baghdad became the pillar of the golden period, this era marked by profound scientific, cultural, and many other achievements that continue to make an impact contemporary understandings of history (Michaud, 2015).



**Figure . Great Mosque of Samarra (spiral minaret). Source:
Izzedine, Wikipedia (n.d.).**

1.4.1. Political factors caused the rise of the Abbasids

The rise of the Abbasid Caliphate in 750 AD was enabled by several significant political consideration that capitalized on the flaw and discontent within the Umayyad Caliphate:

1.4.1.1. Disaffection with Umayyad Rule:

The Umayyad caliphate was perceived as favouring their own kin and the Arab aristocracy, leading to widespread discontent among non-Arab Muslims and the lower classes. This favouritism was particularly pronounced in the eastern provinces, where the majority of the population was Persian, and it resulted in significant social and economic disparities. The Umayyads' preferential treatment of Arab military rulers created limited social mobility for non-Arab Muslims, exacerbating tensions and

fostering resentment. Additionally, the Umayyads faced opposition from various religious groups, including the Shi'a, who opposed them on religious grounds. The Abbasids exploited these tensions by presenting themselves as more pious and just rulers, capitalizing on the discontent to garner support for their own rise to power. By emphasizing their moral superiority and promising a more inclusive and equitable governance, the Abbasids successfully rallied support from diverse groups, including Shiites and non-Arab Muslims, ultimately causing the downfall of the Umayyads and the Abbasid Caliphate established (Arnold, 2018)

1.4.1.2. Abbasid Propaganda and Alliances

The Abbasids traced their lineage to Abbas, the Prophet Muhammad (PBUH) uncle they consider themselves the legitimate heirs of his heritage. This family harmony provides them with vital religious and political validity in the eyes of the Islamic community, mainly among those disillusioned with the Umayyads' perceived worldliness. The Abbasids strategically formed alliances with various groups dissatisfied with Umayyad rule, including the Shi'a and the Kharijites. These alliances provided the necessary military support for the Abbasid revolution, as they capitalized on the discontent among non-Arab Muslims and other marginalized groups. By portraying themselves as champions of Islam and promising a more inclusive and just governance, the Abbasids rallied support from diverse factions, ultimately leading to the overthrow of the Umayyads and the establishment of their own caliphate. This strategic use of religious legitimacy and alliances was instrumental in their rise to power and their ability to consolidate their rule over a vast and diverse empire. (Knysh, 2024)

1.4.1.3. Internal Divisions within the Umayyads

The Umayyads faced internal divisions, including succession disputes and rebellions, which weakened their hold on power. The Abbasids exploited these divisions to their advantage, culminating in the downfall of the Umayyads in 750 CE (Abdi, 2016)

1.4.2. Significance of major Leaders and Regions

The beginning of the Abbasid dominance was significantly influenced by key figures like Abu Muslim Khorasani, He led the military campaign against the Umayyads, and the first Abbasid caliph was Abu Abbas al-Saffah. Support, strategies, and alliances with non-Arab Muslims known as mawali in regions such as Khorasan played a crucial role. The establishment of Baghdad as the new capital by al-Mansur marked a shift toward a more centralized and multicultural society. The incorporation of Persian converts into the administration, due to its important location, strengthened the empire's rule and cultural achievements. As legitimate rulers, their predilection for Sharia law and their lineage to Abbas strengthened them.

1.4.2.1. Khurasan and Abu Muslim: The open revolt against the Umayyads was led by Abu Muslim, who was among the important figures of Khorasan, and the latter played an impact role in the revolt and the end of the Umayyads. (Williams, 2015).

1.4.2.2. Establishment of Baghdad and its Significance:

Caliph Mansur established a turning point in Islamic history with the founding of Baghdad in 762 AD. He transformed the city into a major cultural, scientific, and political centre. Strategically located on the western bank of the Tigris River and at the gates of the ancient city of Ctesiphon, Baghdad controlled major trade routes to the Tigris and Euphrates rivers. The purpose and design of Baghdad were carefully considered. The city

was designed as a circular entity, known as the Round City with a central square featuring the caliph's palace and a mosque. This architectural design, influenced by Persian and Byzantine traditions, reflected the Abbasids' appreciation for diverse cultural styles. Al-Mansur intended Baghdad to be Madinat Al Salam or City of Peace, serving as the capital of Islam and a centre of Islamic governance (Whyislam, 2025).

Baghdad attracted scholars from different parts of the Islamic world and beyond, and quickly strengthened its position as a centre teeming with knowledge and thought. Its strategic location facilitated cross-cultural exchanges, contributing significantly to the preservation and expansion of classical knowledge. The city's access to the Tigris and Euphrates rivers and its position on major trade routes enabled it to accumulate wealth through commerce and manufacturing. This economic prosperity supported the development of arts, sciences, and education, transforming Baghdad into a global centre of learning (Matt, 2025).

Baghdad's cultural achievements were demonstrated by its huge wonderful architecture, such as the Great Mosque of Samarra, and the unique Islamic art forms like Arabic calligraphy. The city's status as a cultural and scientific centre was further enhanced by its role in fostering a rich intellectual environment, where scholars could engage in translation, research, and innovation. Through these initiatives, Baghdad became synonymous with the Islamic Golden Age, and its advancements that continue to influence contemporary understanding of history (Bobrick, 2012).

1.5. Intellectual Achievements : The Function of Earlier

Civilizations:

1.5.1. Effect of Greek, Persian, and Indian knowledge on Islamic Scholarship:

Knowledge of ancient civilizations, including Greek, Persian, and Indian, greatly influenced the Islamic Golden Age. This factor led to the translation of classical texts into Arabic, which enabled Muslim scholars to expand upon them and, in particular, preserve ancient wisdom.

1.5.1.1. Greek Influence:

Greek knowledge profoundly influenced the Islamic world, and the transmission of classical Greek science, philosophy, and mathematics played a significant role in shaping Islamic studies. Scholars such as al-Kindi, al-Pharabi, and Ibn Rushd combined Islamic intellectual traditions with Greek philosophical thought. This harmony enabled by the extensive translation of Greek texts into Arabic, a process that not only preserved ancient knowledge but also enabled Islamic scholars to expand upon it (Pila, 2022).

Greek philosophy influenced Islamic thought, and in order to develop a valuable intellectual environment, they sought to infuse it with Islamic principles. Muslim rulers admired Greek thought, and the works of philosophers such as Aristotle held a significant position. Islamic thinkers used Aristotelian logic to explore theological and philosophical issues. This harmony with Greek philosophy was reinforced in Islamic intellectual discourse and helped develop a precise Islamic theology. The preservation and expansion of Greek knowledge by Islamic scholars also facilitated advancements in many different domains. Foreign texts on mathematics,

astronomy, and medicine were translated and studied extensively, laying the groundwork for significant contributions by Islamic scholars in these areas. For example, the works of Galen and Hippocrates were foundational in Islamic medicine, while Greek mathematical concepts influenced the development of algebra and other mathematical disciplines. Through this process, Islamic scholars not only preserved ancient Greek knowledge but also advanced it, creating a legacy that would later influence European thought during the Renaissance (Wichmann, 2024).



Figure 3 : Ancient Greek civilization (web 3)

1.5.1.2. Persian Influence:

The Abbasid Caliphate was profoundly influenced by Persian administrative traditions, which were inherited from the Sassanid Empire. This influence was evident in the adoption of a centralized administrative system and the use of Persian customs in court etiquette. The proximity of Baghdad to Persia facilitated the integration of non-Arab elements into high-ranking positions within the administration, allowing for a diverse and sophisticated bureaucracy. This bureaucratic structure, similar to that of the Sassanids, enabled efficient governance across vast territories and supported the development of arts, sciences, and education by providing a stable environment for intellectual pursuits.

Persian culture had a lasting impact on Abbasid society; with the Abbasid court they were strongly influenced by Persian customs. The Persian Barmaks, on the other hand, were primarily advisors to the caliphs and competed with them in their rule. This cultural exchange enriched Islamic culture, blending Arab and Persian traditions. While Arabic remained the dominant language of the empire, Persian cultural influences were also significant. The translation of Persian texts into Arabic helped subsume Persian cultural space within the Arabic language, reflecting the Abbasids' efforts to integrate diverse cultural traditions.

Persian scholars from institutions like the Jundishapur Academy made substantial contributions to medicine and philosophy. Their work was integrated into Islamic scholarship, enriching the intellectual landscape of the Islamic world. The Jundishapur Academy was renowned for its medical school and hospital, which attracted scholars from across the region. The integration of Persian scientific and philosophical knowledge into Islamic scholarship facilitated advancements in various fields, establishing the Islamic world as a hub for intellectual innovation during the Golden Age. This intercultural exchange was crucial in shaping the trajectory of Islamic

thought and participation in the era's remarkable achievements in science and philosophy (Gillani, & al., 2014).



Figure 4 : Persian Empire: Rise, Map (web 4)

1.5.1.3. Indian Influence:

Mathematical sciences such as Algebra and astronomy played a major role in the development of the Islamic world and its being considered a pioneer, as it expanded thanks to intellectual exchange and trade as well as between races. Al-Khwarizmi was deeply influenced by Indian numerals and astronomical tables, which he incorporated into his work. For instance, his book *Zij al-Sindhind* introduced the concept of Indian numerals to the Islamic world, marking a significant turning point in the development of Islamic mathematics and astronomy.

Harmony of concepts of algebra and Indian geometry, such as the decimal system, facilitated major advancements in Islamic mathematics and astronomy. Scholars were able to refine celestial models and improve timekeeping methods because of This multicultural exchange fostered Islamic scientific innovations during the Golden Age. The use of Indian astronomical tables, such as those developed by Brahmagupta, was instrumental in establishing the ziy tradition in Islamic astronomy. This tradition involved the creation of tables that allowed astronomers to determine the positions of celestial bodies and calculate prayer times, contributing to the sophistication of Islamic astronomy (Shah, 2025).

The influence of Indian knowledge on Islamic science was not limited to mathematics and astronomy. Indian medical practices and pharmaceuticals were also highly sought after in the Islamic world, With the translation of various Sanskrit medical texts into Arabic, the significant role played by Indian collaborations in shaping the intellectual landscape of the Islamic Golden Age is evident, fostering a cultural environment of learning and innovation and opening up scientific developments for centuries to come (Kumar, & al., 2017).



Figure 5 : Indian civilisation map (web 5)

1.5.2. Early Islamic Scholars and their contributions

The early Muslim Scholars contributed noble values and aids in various fields, including algebra, geometry, medicine, metaphysics, and others. They expanded the development of knowledge, paving the way for future sciences. (Benmohamed, 2024):

1.5.2.1. Al-Kindi (801–873)AD: The base of Islamic Philosophy

Al-Kindi, known as the Father of Islamic Philosophy, He was an important figure in the Islamic Golden Age, translating many texts into Arabic, including philosophical texts from other languages, although he did not perform the translations himself. Al Kindi used these translations to enriched vocabulary of philosophical thought in Arabic by working with a group of translators. The contributions of Al Kindi spanned geometry, medicine, philosophy, and logic, and he is credited with introducing Indian numerals to the Islamic and Christian worlds.

Kindi is best known for his writings on astrology and in other essays he argued that the world is not eternal. Kindi's philosophical treatises, such as (On First Philosophy), emphasized the unity of God and the concept of creation ex nihilo, departing from Aristotle's views. Al-Kindi focus on reason and intellectual pursuits helped establish philosophy as a distinct discipline within Islamic thought, setting the stage for later philosophers like Ibn Sina and Ibn Rushd.

Despite his significant contributions, Al-Kindi's ideas were later superseded by those of Ibn Sina, who developed more advanced philosophical frameworks. Nonetheless, Al-Kindi remains a foundational figure in Islamic philosophy, bridging Greek philosophical traditions with Islamic thought and influencing intellectual developments beyond the Islamic world

1.5.2.2. Al-Khwarizmi (8th–9th centuries): Pioneer in Algebra

Al-Khwarizmi was a mathematician known for his distinctive methods of simplifying equations and for his use of Euclidean division in his interpretations. He caused a stir in the world of algebra, which was facilitated by his use of gypsy numbers. Eventually, the Islamic world became a centre of mathematical innovation during the Golden Age, thanks to the assistance provided by Al-Khwarizmi.



Figure 6 : Al-Khwarizmi (web 6)

1.5.2.3. Ibn Sina (Avicenna,980–1037AD): Polymath and Medical Authority

Ibn Sina, the pillar of medicine in this era, made significant helps not only to medicine but also to philosophy and so on. Known as the author of The Canon of Medicine book, he was a fundamental in medical knowledge for many eras, having profound implications and influences on both Islamic and European medical traditions. Further solidifying his reputation as a leading figure in Islamic scholarship

1.5.2.4. Ibn Rushd (Averroes,1126–1198AD): Philosopher and Physician

Ibn Rushd, known as Averroes, was a philosopher and physician who wrote extensively on medicine and philosophy. His commentaries on Aristotle had a profound impact on European thought during the Renaissance, influencing the development of Western philosophy and science.

1.5.2.5. Ibn al-Haytham (965–1040AD): Renowned Physicist and Astronomer

Ibn al-Haytham made pivotal achievement and contributions to optics and delved into physics and astronomy. His works challenged Aristotle's views on motion and vision and served as an effective launching pad for subsequent scientific developments in these domains. Ibn al-Haytham's treatises on optics, and the Book of Optics in particular, were influential, shedding complete light on the subject of light and vision, that would shape the trajectory of optical science for centuries to come.

1.6. The Translation Movement: A Catalyst for Intellectual Advancement

The Translation Movement during the Abbasid Caliphate was a pivotal catalyst for intellectual advancement. This movement involved translating Greek, Persian, and other texts into Arabic, preserving ancient knowledge and fostering original intellectual developments. The translation of works on medicine, metaphysics, and algebra was undertaken under the patronage of prominent figures such as Hunayn ibn Ishaq, including facilities provided by institutions such as the House of Wisdom in Baghdad. The translation movement had impacts in several fields, including European thought during the Renaissance and Islamic sciences in particular. On the other hand, the translation movement paved the way for future scientific and philosophical innovations through the harmonization of diverse traditions in both the Islamic and Western worlds (Mansour, 2020).

1.6.1. Overview of the Translation Movement:

The transformative intellectual endeavour of the Golden Age of Islam was facilitated by the Movement of translation, which stretching from the eighth to the thirteenth centuries. It included the translation of ancient texts from, Persian, Indian and Greek languages into Arabic, promoted by key figures such as Al-Mansur and Al-Ma'mun and. Their goal was to create a comprehensive library of knowledge by translating famous works in philosophy, science, and medicine, thereby preserving classical knowledge and facilitating its expansion.

The translation movement did not include Greek texts and drew on works from the Persian and Indian traditions. Significant progress was made in algebra, geometry, medicine, astronomy, and philosophy, facilitating future explorations. “Bayt Al Hikmah” in Baghdad was a central institution in this movement, housing a vast collection of translated texts and serving as a hub for scholarly activities. Other cities like Antioch(turkey), Cairo(Egypt), Damascus(Syria), Merv(Iran), and Cordoba(Spain) also played significant roles in the translation efforts (Khan academy, 2020).

The movement involved a diverse group of translators, including Eastern Christians, Jews, and Muslims. These translators used various techniques, from literal translations to more adaptive renderings, to convey complex ideas in Arabic. The Arabic language, with its unique linguistic features, proved particularly adept at absorbing foreign concepts, making it the ideal language for this intellectual endeavour.

The translation movement did not include Greek texts and drew on works from the Persian and Indian traditions. Significant progress was made in algebra, geometry, medicine, astronomy, and philosophy, facilitating future explorations, Scientific progress in Europe, which had a significant impact on the translation movement at the global intellectual level. (Selougha, 2022).



1.6.2. Key figures and institutions involved (e.g., House of Wisdom)

In the Islamic Golden Age, the translation movement was an intellectual endeavour and a starting point, as is clear in the previous context , It included the translation of many Persian languages, and Indian languages into Arabic, a process that was instrumental in shaping the intellectual landscape of the era (Selougha, 2022).



Figure 8 : 1.1.1. House of Wisdom (web 8)

Key Figures :

- **Hunayn ibn Ishaq (809–873):** A renowned translator and physician, Hunayn ibn Ishaq was pivotal in translating Greek medical texts, including works by Galen and Hippocrates, into Arabic. His meticulous translation methods emphasized understanding the subject matter before translating it, setting a high standard for future translators.
- **Al-Kindi (801–873):** this scholar Known as the Father of Islamic Philosophy, he played an important and crucial role in translating Greek philosophical texts into Arabic. This effort drive to the framework for Islamic philosophical impression, integrating Greek ideas with Islamic principles.
- **Al-Khwarizmi (8th–9thcenturies):** A mathematician and astronomer, Al-Khwarizmi contributed to the translation of Indian mathematical concepts and developed algebraic methods, revolutionizing mathematics and astronomy.

1.6.2.1. Key Institutions:

- **House of Wisdom:** A pivotal institution in the translation movement, it served as a centre for translation and scientific research, attracting scholars from diverse backgrounds. It was founded in Baghdad. To engage in translation, research, and intellectual discussions.
- **Other Translation Centres:** Cities like Antioch(Turkey), Cairo(Egypt), Damascus (Syria), Merv(Iran), and Cordoba(Spain) also hosted significant translation efforts, contributing to a networked enterprise that spanned the Islamic world. This network

facilitated cross-cultural exchanges the expand knowledge completely.

As for the translation movement, individuals and institutions play an active role. which preserved both ancient knowledge and contributed to original research and innovations in mathematics, medicine, philosophy, and astronomy. The exchange of ideas between cultures was important, and helped change the way people thought in Europe and the Islamic world, especially during the Renaissance. (Willinsky, 2018).

Conclusion:

In conclusion, in Islamic history the Golden Age was characterized by remarkable achievements in science and culture, meaning that it was a period of radical transformation in the world. On the other hand, the Abbasid Caliphate played a tremendous role in the prosperity and development of this period. As for the rise of the Abbasids, it was thanks to alliances and strategies, as they reached their peak by establishing a center of science and scientific research, namely Baghdad as assimilation of knowledge from earlier civilizations, such as Greek, Persian, and Indian traditions. For Islamic scholarship, the Golden Age played a pivotal role. For Islamic scholarship, the Golden Age played a pivotal role. The translation movement played a key role in preserving ancient wisdom and preserving original sources in different domains. This chapter explores the historical context and intellectual findings of the Golden Age of Islam, shed light on its deep influence on global intellectual enduring legacy, which continues to inspire and affected achievements today.

*Chapter 2: Scientific and
Cultural Achievements of the
Islamic Golden Age*

Chapter 2: Scientific and Cultural Achievements of the Islamic Golden Age :

Introduction :

Islamic Golden Age, extends from the 8th to the 14th century, was a crucial era known by deeper their scientific, cultural, and intellectual achievement. The Islamic world became a hub for learning and innovation during this period, with cities such as Baghdad and Cordoba serving as centres for intellectual inquiry. Scholars such as, Ibn al Haytham, Al Khwarizmi, Ibn Sina, and Al-Razi made groundbreaking help and achievement to mathematics, astronomy, medicine, and philosophy, building the bases for the coming scientific developments in Europe during the Renaissance. The period also achieved a flourishing of architecture, art, and literature, with extraordinary works like One Thousand and One Nights and the poetry of Rumi. This chapter delves the scientific and cultural achievements of the Islamic Golden Age, highlighting its influence on European science and the ongoing legacy of Islamic contributions in modern science and culture.

2.1. Scientific Advancements: Mathematics, Astronomy, and Medicine:

The Islamic Golden Age, spanning from the 8th to the 14th century, was a transformative period marked by profound scientific advancements in mathematics, astronomy, and medicine. During this era, scholars such as Al-Khwarizmi, Ibn al-Haytham, and Avicenna made groundbreaking contributions that not only preserved ancient knowledge but also fostered original discoveries. In mathematics, the development of algebra

revolutionized problem-solving techniques, while in astronomy, precise measurements and new instruments enhanced understanding of celestial bodies. In medicine, works like Avicenna's *The Canon of Medicine* became foundational texts, influencing medical practice for centuries. This chapter explores these scientific advancements, highlighting their significance in shaping Islamic scholarship and their enduring impact on global intellectual heritage.

2.1.1. Mathematics:

During the Islamic Golden Age, mathematics underwent significant advancements, transforming it into a more sophisticated and versatile field:

Al-Khwarizmi's contributions to mathematics are most notably reflected in his seminal work, *Al-Kitab al-Mukhtasar fi Hisab al-Jabr wal-Muqabala* (The Compendious Book on Calculation by Completion and Balancing). This book provides systematic and easy methods for solving quadratic equations, including linear ones, explaining the fundamentals of modern algebra. On the other hand, Al-Khwarizmi presented equations in six standard forms, including modern notation.

Notably, his work did not use symbolic notation; all procedures were described verbally.

In addition to his work in algebra, Al-Khwarizmi played a significance role in popularizing the Arabic numeral system in algebra and decimal point and zero. The system, borrowed from Indian mathematics, caused a major upheaval in arithmetic operations and played a pivotal role in transforming the way numbers are represented and used in arithmetic operations. The term Algorithm itself is derived from Al-Khwarizmi's name, reflecting his contributions to systematic mathematical procedures. His influence extended beyond the Islamic world, impacting

mathematicians such as Fibonacci and building the progress of mathematics in Europe during the Renaissance.

Beyond the significance contributions to algebra of Al Khwarizmi, Islamic mathematicians made significant advancements in other areas of mathematics, including geometry, trigonometry, and number theory. Mathematicians like Thabit ibn Qurrah and Ibn al-Haytham contributed substantially to geometry, focusing on conic sections and their optical properties. These geometric techniques were applied to practical problems such as designing sundials and determining the direction of Mecca for prayer, showcasing the integration of mathematics with religious and everyday life.

In the domain of trigonometry, Muslim scholars like Al-Battani had a pivotal role in its development, particularly in spherical trigonometry. Their work was driven by astronomical needs, including determining prayer times and the direction of Qibla. Al-Battani created the cotangent tables and the new trigonometric ones, and his innovation led to the development of astronomical instruments and calculations. (Knorr, 2025).

Cryptography also saw early developments during this period, with Al-Kindi introducing cryptanalysis and frequency analysis. Scholars like Ibn al-Haytham explored number theory, delving into problems involving congruences and amicable numbers. The practical applications of these mathematical advancements were widespread. Algebraic techniques were used to solve inheritance and trade matters, as noted in Al-Khwarizmi's work. In various fields, including trade and astronomy, he revolutionized the efficiency and accuracy of these processes, making them easier and simple to use in mathematical calculations. These contributions and praise enriched Islamic society and also influenced subsequent mathematical developments in Europe.

Al-Khwarizmi's work had a profound impact, as his influence was immense on many generations of mathematicians from various cultures. His systematic approach to solving quadratic and linear equations laid the foundations of modern algebra, as exemplified in his book "The Compendious Book on Calculation by Completion and Balancing ". This foundational text was widely studied and translated, becoming a cornerstone for later mathematicians such as Fibonacci, who incorporated Al-Khwarizmi's algorithms into his own work, *Practica Geometrica*. The influence of Al-Khwarizmi can also be seen in the widespread adoption of Arabic numerals across Europe during the Renaissance. These numerals or numbers, revolutionized arithmetic and made it easier to perform complex calculations in various fields, including commerce and astronomy. The term algorithm comes from Al-Khwarizmi, whose contributions helped shape the course of algebra and played a role in the development and expansion of mathematics during the Renaissance, including his guidance on methodological procedures that have become an integral part of modern mathematics (Usman, 2023).



Figure 9: Mathematics in the Islamic world (Knorr, 2025)

2.1.2. Astronomy:

During the Islamic Golden Age, astronomy experienced significant advancements, driven by the translation of ancient texts and the development of new instruments and methods:

2.1.2.1. Translation and Synthesis of Ancient Knowledge:

Scholars played a major role in translating and synthesizing ancient knowledge from foreign languages into Arabic. This hard work and effort has been reinforced by the works of prominent figures like Ptolemy, whose *Almagest* was updated and refined by Islamic astronomers. Al-Farghani's *Elements of Astronomy on the Celestial Motions* provided a clear explanation of Ptolemy's *Almagest*, contributing significantly to a deeper understanding of celestial mechanics. These translations not only preserved ancient knowledge but also laid the groundwork for further astronomical discoveries by Islamic scholars (Andri, 2024).

2.1.2.2. Observatories and Instruments:

The establishment of the first observatory in Baghdad in the 8th century marked a significant milestone in astronomical observations. This observatory facilitated precise celestial observations, enabling astronomers to gather more accurate data about the movements of celestial bodies. Islamic astronomers also developed and refined many instruments, including the astrolabe, armillary spheres, and celestial globes. The astrolabe, originally a Greek development, was particularly refined and largely used by Islamic astronomers for solving problems in spherical astronomy. These instruments were crucial in enhancing the astronomical exactness, and calculations (Sardar, 2011).



Figure 10 : Observatories and Instruments (web 9)

2.1.2.3. Contributions to Astronomical Models

New astronomical models developed because of to the New astronomical models developed thanks to the involvement of Muslim astronomers. Scholars like Ibn Yunus and Ibn al Shatir discovered inconsistencies in the presentation of the equinoxes as a challenge to the prevailing Ptolemaic models. Their findings paved the way for the later heliocentric model, although they did not fully adopt a heliocentric view themselves. The Tusi Couple, progressed by Nasir al-Din al-Tusi, facilitating the apparent linear motion of celestial bodies, This contributed to the development of new planetary system models, and these victory constituted crucial steps regarding a precise understanding of the mechanisms of celestial motion.

2.1.2.4. Practical Applications

Astronomical knowledge had practical applications as it flourished in the golden age of Islam. It was used in Islamic practices, including determining the direction of Mecca and prayer times. This required precise timekeeping and a deep understanding of celestial movements. Astronomical tables, known as *zij*, were compiled to record the positions of celestial bodies, aiding in navigation and timekeeping. These practical applications not only facilitated religious observances but also contributed to advancements in navigation and trade, highlighting the integration of astronomy with everyday life in Islamic society (Shannon, 2022).

2.1.3. Medicine:

Medicine advanced greatly in the Golden Age of Islam, and its development had an impact on subsequent medical practices in Europe and elsewhere:

2.1.3.1. Establishment of Hospitals and Medical Education:

At the era of The Golden Age, hospitals were established marked a significant advancement in healthcare. These institutions were funded by charitable donations, such as Zakat, and served not only as centers for treating the sick but also as hubs for medical education and research. Hospitals like the Qalawun Hospital in Cairo could accommodate thousands of patients and employed a diverse staff of physicians, pharmacists, and nurses. Some hospitals specialized in treating specific conditions, such as leprosy, reflecting a sophisticated understanding of disease management. The hospital system was well-organized, with facilities that included dispensaries and research facilities, enabling discoveries about the contagious nature of certain diseases. These hospitals also played a role in sending medical professionals to rural areas, ensuring that healthcare was accessible beyond urban centres.

Medical education during this period was structured on a tutelage basis, where students would travel to learn from renowned physicians. This system ensured that knowledge was passed down effectively and that medical standards were maintained. The tutelage model allowed for personalized learning and hands-on training, which was crucial for developing practical skills in medicine. As a result, medical education became more formalized, with students gaining comprehensive training under experienced mentors. The facilitated systematic approach to medical education greatly expanded the competence of physicians, contributing to the overall advancement of medical practice in the Islamic world (Martin, 2010).

2.1.3.2. Contributions of Prominent Physicians:

Al-Razi, known as Rhazes, was a deep writer who wrote over 200 books on medicine and philosophy. His works were translated into Latin and became foundational texts in Western medicine, influencing medical education and practice for centuries. Notably, his book *Al-Hawi fi Al Tibb* (The Comprehensive Book on Medicine) synthesized medical knowledge from Greek, Persian, Indian, and Arabic traditions, providing a comprehensive overview of medical science at the time. Al-Razi's contributions extended beyond his writings; he was an early proponent of experimental medicine and served as chief physician at major hospitals in Baghdad and Ray. Ibn Sina, known as Avicenna, also made significant contributions with his *Canon of Medicine*, which synthesized medical knowledge from various traditions and remained a standard reference for centuries. This work was widely studied and translated, shaping medical education across the Islamic world and Europe.

2.1.3.3. Surgical Innovations

Al-Zahrawi, known also the father of surgery, made contributions to surgery were immense. In his book, "*Kitab al-Tasrif*," he documented many surgical procedures and pioneered techniques such as using stitches. His advancements and innovations in pain relief and surgical instruments significantly advanced and involve the field. His detailed facilitating prescriptions for surgical operations were superior to others of his time, influencing and affecting subsequent surgical practices in the Islamic world and Europe. (Yvette, 2018)



Figure 11 : Advancements in Medicine During the Islamic Golden Age (web 10)

2.1.3.4. Pharmacology and Botany

Ibn al-Baytar composed a comprehensive study on thousands of medicines, including herbal medicines, and his work became a reference in the field of herbs. He worked to shed light on the uses of medicinal plants for healing. This period worked to introduce new advanced medicines and processes such as distillation and infusion. These developments expanded the range of available treatments and improved the understanding of drug interactions and efficacy. Al-Razi also contributed significantly to pharmacology, using a variety of drugs and developing methods for their preparation, such as oils, powders, and infusions. His advanced research in medicines and treatments has become the basis for subsequent treatment and developments.

2.1.3.5. Impact on Later Medicine:

This era witnessed subsequent medical developments thanks to the contributions and influence of doctors, as the works of both Al-Razi and Avicenna were translated into Latin and were a basis for European medicine in the Renaissance era due to factors such as the publication and fame of Avicenna's book more than 35 times. In the Islamic world, the construction of hospitals established paths for modern health care systems and were also centres for medical research, leading to the development of similar systems in Europe. Muslim doctors combined medical knowledge from traditions such as Roman, Persian, and others, and their influence was clear in this field.

This integration of diverse medical practices helped create a comprehensive understanding of health and disease, which was later adopted in Europe. The development of new surgical techniques by figures like Al-Zahrawi and advancements in pharmacology further contributed to

the evolution of medicine. Al-Zahrawi's Kitab al-Tasrif, turned into Latin, became an important medical text in universities of Europe, highlighting the influence of Islamic medicine on later surgical practices.

The influence of Islamic medicine extended beyond Europe, contributing to the broader Renaissance of Western Europe. The transmission of Islamic knowledge through Spain played a crucial role in reviving classical learning and introducing new sciences, helping Europe emerge from the Dark Ages. Overall, Islamic medicine's legacy as a cornerstone of medical history is evident in its enduring impact on modern healthcare systems and medical practices (Ammar, 2018)

2.2. Contributions of Al-Khwarizmi, Ibn al-Haytham,

Avicenna (Ibn Sina), and Al-Razi

Significance scholars like Al-Khwarizmi, Ibn al-Haytham, Ibn Sina, and Al-Razi were key figures in the Golden Age of Islam. Each of them has contributions in a profound scientific field. Al-Khwarizmi founded algebra which taken from his name and introduced the Hindu-Arabic numeral system, revolutionizing mathematics and computation. Ibn al-Haytham made revolutionary contributions to astronomy and optic, with existing theories with empirical observations. Avicenna, a polymath, enduring works on medicine and philosophy, like his book The Canon of Medicine, which remained basic texts for centuries. Al-Razi, a renowned physician, challenged prevailing medical theories through empirical research, leaving a big influence on Western medicine. Their collective contributions preserved ancient knowledge and fostered original

development, shaping the intellectual landscape of the Islamic world and beyond.

2.2.1. Al-Khwarizmi:

Al-Khwarizmi was a polymath had a deep contributions to mathematics, astronomy, and geography. His most remarkable work, *Al-Kitab al-Mukhtasar fi Hisab al-Jabr wal-Muqabala* (The Compendious Book on Calculation by Completion and Balancing), introduced systematic methods quadratic equations and solving linear, leading to the foundation for modern algebra. The term "algebra" itself is derived from the title of this book, *al-jabr*. Al-Khwarizmi also popularized the Hindu-Arabic numeral system, which revolutionized arithmetic operations across the Middle East and Europe. His work in astronomy included compiling detailed astronomical tables, known as the *Zij Al-Sindhind*, crucial for understanding celestial movements and determining prayer times. In addition, Al-Khwarizmi had a role and contributions in geography, providing many locations with accurate coordinates as he reviewed Ptolemy's geography (Gilbert, 2022).

2.2.2. Ibn al-Haytham:

Ibn Al Haythem, a famous mathematician and physicist known as Alhazen, revolutionized the field of optics by challenging prevailing theories of vision and light and introducing experimental methods. Ibn al-Haytham's contributions to number theory included exploring issues related to congruence and homogeneous numbers. His work in geometry and trigonometry and in the study of the optical properties of conic sections, was also of great importance. He influenced later scientists in the Islamic world and Europe with his emphasis on experimentation, the foundations of the scientific method (Baytalfann, 2023).

2.2.3. Avicenna (Ibn Sina)

Ibn Sina, was a philosopher and physician whose achievement to medicine were deep. His Canon of Medicine synthesized medical knowledge from a lot and different traditions and remained a standard reference for a long time, influencing medical education across the Islamic world and Europe. This comprehensive work covered a wide range of medical topics, from anatomy and physiology to pharmacology and treatment methods. Avicenna's philosophical works also had a significant impact on European thought during the Renaissance, shaping both medical and philosophical discourse. His influence extended beyond medicine, as his philosophical texts were widely studied and translated into Latin, contributing to the revival of classical learning in Europe (Snell, 2019).

2.2.4. Al-Razi (Rhazes)

Al-Razi who wrote deeply on medicine and philosophy. His *Kitab al-Hawi* (The Comprehensive Book on Medicine) was a major medical encyclopaedia that covered various diseases and treatments. Al-Razi was known for his empirical approach to medicine, often challenging prevailing theories based on observation and experimentation. his works became foundational texts in Western medicine were translated into Latin, impacting medical practices for many centuries. Al-Razi's contributions to pharmacology and chemistry were also significance, as he introduced new medicaments and testing methods. His emphasis on empirical observation and experimentation laid the groundwork for later medical advancements in Europe (O'Mara, 2022).

2.3. Impact on European science during the Renaissance:

there was a deep influence on European science during the Renaissance. The dissemination of Greek and Islamic knowledge to Europe was easy thanks to the transmission of diverse knowledge to Europe, He stimulated a return to classical study and learning and impacting scientific disciplines like mathematics, astronomy, and other fields. Figures like Al-Khwarizmi and Avicenna contributed significantly to European intellectual developments, with their works on algebra and medicine becoming foundational texts. The Islamic emphasis on empirical observation and scientific inquiry inspired European scientists, laying the groundwork for the Scientific Revolution. Through centres like Toledo and The island Sicily , Islamic knowledge flowed into Europe, creating the intellectual environment of the Renaissance and beyond.

2.3.1. Preservation and Transmission of Classical Knowledge:

in the 8th century under the Abbasid Caliphate, the Islamic Translation Movement had an ongoing impact and role in disseminating classical knowledge by translating Greek, Persian, and Indian texts into Arabic, ensured the survival of works by renowned figures like Aristotle, Euclid, and Ptolemy. These translations contributed to preserving ancient knowledge, disseminating it, and integrating it with Islamic thought, which led to great achievement, in fields such as medicine, astronomy, and mathematics. The transmission of these texts to Europe occurred through various routes, including Al-Andalus (Muslim Spain), Sicily (In Italy), and the Crusader kingdoms. As these works were translated from Arabic into Latin, they sparked a revival of classical learning in Europe, laying the groundwork for the Renaissance. This movement bridged cultural divides, allowing scholars from different backgrounds to engage with a shared

intellectual heritage, and its legacy continues to influence modern science and philosophy (Rudy, 2021).

2.3.2. Scientific and Philosophical Contributions:

Islamic mathematicians like Al-Khwarizmi made groundbreaking contributions by introducing algebra and the decimal system, revolutionizing arithmetic operations across the Middle East and Europe. Astronomers such as Al-Biruni and Ibn Yunus also played a crucial role, with Al-Biruni calculating the Earth's circumference and Ibn Yunus making over 10,000 observations of the Sun's position using a large astrolabe. Their work influenced later European astronomers, including Copernicus. In medicine and philosophy, figures like Ibn Sina (Avicenna) and Ibn Rushd (Averroes) wrote influential texts that were widely studied in Europe, shaping medical education and philosophical thought. Additionally, Ibn al-Haytham's *Kitab al-Manazir* (The Book of Optics) introduced experimental methods in optics, influencing later scientists such as Roger Bacon. These contributions not only preserved ancient knowledge but also expanded upon it, laying the groundwork for significant advancements in various fields during the Renaissance (Parvez, 2021).

2.3.3. Cultural and Intellectual Exchange:

The Islamic Golden Age had a profound impact on European science during the Renaissance through a multifaceted cultural and intellectual exchange. Islamic contributions played a crucial role in the intellectual awakening of Europe. With the revival of classical knowledge and the introduction of new scientific ideas, the establishment of universities in Italy and Spain, along with the scientific revolution where Arabic was the language of instruction, facilitated the exchange of ideas between Muslim and European scholars. This combination contained the

preservation of classical knowledge and offered also scientific and philosophical contributions from Muslim scholars, shaping the course of European intellectual history. The influence of Islamic thought and science helped bridge cultural gaps, contributing to the Renaissance and beyond by creating an environment that attracted scholars and researchers from diverse places around the world to engage with a shared intellectual legacy (Saifullah, 2021).

2.4. Cultural Flourishing: Art, Architecture, and Literature

During the Islamic Golden Age, art, architecture, and literature experienced a profound flourishing. Islamic art forms, such as intricate calligraphy, ceramics, and textiles, became renowned for their beauty and craftsmanship. Architectural achievements, including majestic mosques and palaces, showcased the era's engineering prowess and aesthetic sensibilities. Literature also thrived, with works like *One Thousand and One Nights* becoming part of global cultural heritage. The poetry of figures like Rumi further enriched Islamic literature, reflecting the era's emphasis on spiritual and intellectual exploration. This cultural flourishing was facilitated by cross-cultural exchanges and patronage from caliphs, creating a rich legacy that continues to inspire artistic and literary achievements today.



Figure 12 : Islamic Architecture (web 11)

2.3.1. Development of Islamic art forms (calligraphy, ceramics, architecture)

Islamic art during the Golden Age flourished across various mediums, including calligraphy, ceramics, and architecture. Calligraphy, an interesting aspect of Islamic art, involved as a respected form, often used in architectural decoration and also manuscripts. The use of Arabic calligraphy was not only aesthetically pleasing but also carried deep spiritual significance, as it was used to adorn the Quran and other religious texts. Ceramics also thrived, with techniques like lustre painting becoming popular in cities like Samarra. This technique involved applying metallic oxides over a white glaze, creating a glittering effect that was admired throughout the Islamic world and even influenced European ceramic decoration (Candela, 2025).

Islamic architecture emerged through the construction of magnificent architectural landmarks, such as the Umayyad Mosque in Damascus and the Dome of the Rock in Jerusalem. These buildings were characterized by ancient Byzantine and Cuban architecture, forming an Islamic style characterized by arches and intricate decorations known as arabesque. The arabesque, a repeating pattern of floral or vegetal motifs, symbolized the infinite and indivisible nature of God, reflecting the Islamic prohibition on depicting living forms. This aesthetic was not only visually stunning but also carried profound spiritual meaning, making Islamic art a unique blend of beauty and devotion. The patronage of art and architecture by rulers was a way to display wealth and power, leading to the construction of numerous mosques, madrasas, and palaces that continue to inspire wonder today (Dušan, 2022).



Figure 13 : Islamic art (web 12)

2.3.2. Literary contributions (e.g., *One Thousand and One Nights*, Rumi's poetry)

The Islamic Golden Age was a period marked by works that still influence the world nowadays. One of the most famous works is the book *One Thousand and One Nights*, which is stories collection and folk tales that have impressed readers around the world. This reflects the rich storytelling traditions of the Islamic world, as it combines different influences. Another notable literary figure is Rumi, a Persian poet whose mystical poetry has become renowned for its depth and beauty. Rumi's works, such as the *Masnavi-e Manavi*, are considered classics of Sufi literature, exploring themes of love, spirituality, and self-discovery. The Islamic Golden Age also saw the development of various poetic forms, including the *Qasida*, *Ghazel*, *Qitah*, *Masnavi*, and *Robai*, which were used to express large emotions and ideas. Literary achievements influenced European literature and, of course, Islamic culture, contributing to cultural exchange between the Islamic world and Europe during the Renaissance (Britannica, 2025).

2.3.3. Philosophical developments (e.g., Al-Pharabi, Averroes)

The Islamic Golden Age was a period of philosophical development, marked by the emergence of thinkers who worked to harmonize Greek philosophy with Islamic thought. Al-Pharabi, known as the second teacher after Aristotle, played a role in integrating Islamic theology with Aristotelian philosophy. He wrote extensively on logic, metaphysics, and ethics, and his works were instrumental in establishing a rationalist tradition within Islamic philosophy. Another key figure was Averroes (Ibn Rushd), who further developed Aristotelian thought and had

a profound impact on European philosophy. Averroes' commentaries on Aristotle's works helped revive Aristotelianism in Europe, influencing thinkers like Thomas Aquinas and shaping the intellectual landscape of the Renaissance. The philosophical developments during this era were characterized by a blend of philosophy, which emphasized logic and reason, and Kalam, which focused on the explanation and rationale of Islamic religious beliefs. This synthesis of philosophical traditions not only enriched Islamic thought but also contributed to the broader intellectual heritage of the world, influencing later philosophical movements in Europe and beyond (kharchoufa,2024).

2.4. Cross-Cultural Exchanges and Global Influence:

The impact of cultural exchanges during the Islamic Golden Age was very profound. The Islamic world and Christian Europe witnessed extensive or broad cultural exchanges, despite all the problems and wars and obstacles such as the Crusades and other obstacles. The Mediterranean served as a hub for trade and knowledge transfer, with some cities such as Toledo (Spain) and Sicily (island in Italy) facilitating the translation of Arabic texts into Latin, thus transmitting Greek and Islamic knowledge to Europe. These exchanges not only enriched European science and culture but also influenced art and architecture, as seen in the arabo-normand style of Sicily(Italy). The legacy of these exchanges continues to shape modern science and culture, with many Arabic terms and concepts remaining integral to global intellectual heritage.

2.4.1. Trade networks and intellectual exchanges with Europe, India, and China:

The Islamic Golden Age was marked by the establishment of trade and distribution links between Europe, China, and India, which

contributed to economic development. The Islamic world controlled major sea routes including the Indian Ocean and the Mediterranean, as well as the Silk Road. These trade routes offered spices, metals, and textiles. Merchants and scholars travelled along these roads, exchanging knowledge. There was important intellectual exchange, but thanks to the use of Arabic as a common language, monetary transactions in gold and silver were possible, and translations of texts also helped European scholars. Indian and Chinese thinkers and scholars helped to develop astronomy, algebra, and geometry. Ultimately, all innovations and inventions became popular due to trade networks (Michalopoulos, 2018)

2.4.2. Legacy of Islamic achievements in modern science and culture:

The Golden Age of Islam was a significant period marked by progress in various fields that continues to shape culture and science today. Thanks to the Islamic world, knowledge advanced and its broad scope was preserved in many fields, such as medicine, philosophy, and mathematics. Key figures and thinkers like Al-Khwarizmi, Ibn al-Haytham, and Ibn Sina create groundbreaking contributions that not only influenced European science during the Renaissance but also remain integral to modern disciplines. The transmission of Arabic texts into Latin facilitated the revival of classical learning in Europe, contributing to the intellectual and scientific developments of the Renaissance. Today, Islamic achievements continue to inspire advancements in fields such as mathematics, medicine, and astronomy, underscoring the enduring impact of Islamic scholarship on global intellectual heritage.

2.4.2.1. Legacy in Modern Science:

The Islamic Golden Age's contributions to modern science are profound and multifaceted. Scholars like Al-Khwarizmi and Ibn al-

Haytham laid the groundwork for later scientific advancements. Al-Khwarizmi's introduction of algebraic methods influenced European mathematicians such as Fibonacci, while Ibn al-Haytham's emphasis on experimentation in optics shaped the scientific method used by figures like Roger Bacon and Galileo. The establishment of hospitals and medical schools during this period revolutionized healthcare, with physicians like Ibn Sina (Avicenna) and Al-Razi (Rhazes) contributing to medical knowledge that remained authoritative for centuries. Today, concepts from Islamic mathematics and astronomy continue to inspire new discoveries in fields like materials science and astrophysics. For instance, the use of Arabic numerals and algebraic methods remains fundamental in modern mathematics, while astronomical discoveries by Islamic scholars continue to influence our understanding of the cosmos.

2.4.2.2. Legacy in Modern Culture:

Cultural legacy encompasses science, art, architecture, and literature. Architectural styles evolved with the use of arches and domes, which influenced global building designs. Islamic art, characterized by geometric patterns such as calligraphy, has inspired artists and designers from many regions across the world. Many literary works, like the One Thousand and One Night, are part of global cultural legacy, including initiatives in storytelling and culture. Regions like the United Arab Emirates have made important strides in connecting the arts, sciences, and technology. This legacy contains new and modern educational systems that emphasize the acquisition of knowledge and thought (Andri, 2024).

2.5. Global Impact

The Islamic Golden Age reveals its influence on culture and science in the cultural exchanges that took place during this period. The transfer of

knowledge to Europe was driven by the translation movement, which not only preserved ancient wisdom but also fostered original thought and innovation, profoundly shaping modern science and culture. Today, the legacy of the Islamic Golden Age continues to inspire achievements in science, technology, and the arts, testament to the enduring power of cultural exchange and intellectual curiosity. The way modern societies value education, scientific research, and cultural diversity can be seen in the influence of Islamic sciences, reflecting the spirit of collaboration and intellectual exploration that characterized the Islamic Golden Age (Deewan, 2023).

Conclusion:

To conclude, the Islamic Golden Age was the era of change this period marked by deep scientific and cultural achievements that had a big influence on global intellectual legacy. The era saw significant advancements in mathematics, astronomy, and medicine, with scholars like Al-Khwarizmi, Ibn al-Haytham, Avicenna, and Al-Razi making groundbreaking contributions. These scientific developments preserved ancient knowledge and also enriched and fostered original discoveries, influencing European science during the Renaissance. In culture, Islamic art, architecture, and literature flourished, with notable works such as *One Thousand and One Nights* and the poetry of the poet Rumi. Philosophical developments by key figures like Al-Farabi and Ibn Al-Rushd further enriched Islamic thought. The multicultural exchanges facilitated by trade networks and intellectual collaborations with Europe, India, and China underscored the Islamic Golden Age's role as an important moment in global history, shaping modern science and culture in enduring ways.

***Chapter 3: The Translation
Movement and Its Impact on
Knowledge Preservation and
Dissemination***

Chapter 3: The Translation Movement and Its Impact on Knowledge Preservation and Dissemination:

Introduction :

This chapter examines the pivotal role of the Greco-Arabic translation movement in preserving and disseminating ancient knowledge across civilizations. This movement began in the mid-eighth century AD and flourished during the Abbasid era in Baghdad. It focused on translating a large number of Greek, Persian, and Indian texts into Arabic, thanks to its abundant financial resources, with the support of key institutions such as the Bayt al-Hikmah and renowned translators like Hunayn ibn Ishaq. The chapter explores the mechanics of this process, showing how ancient works were meticulously provided into Arabic and often via important languages like Syriac through the collaborative activities of different scholars and rulers. The translation movement became a driver for intellectual development. Behind the mere protection of old traditions and so on. Scholars safeguarded the scientific, philosophical, and medical heritage of previous civilizations and critically engaged with these texts, enriching and expanding upon them, especially in domains like mathematics and medicine. This dynamic process transformed Arabic into a language of science and philosophy, laying the groundwork for new disciplines and original contributions.

3.1. The Mechanics of the Translation Movement

The translation movement in the golden age of Islam was very organized and its starting point was Baghdad, which the Abbasids took as their capital. The translation movement was a reason for enriching intellectual life and preparing the way for future innovations, as its goal was to acquire knowledge of previous civilizations in various fields and translate and delves into them .



Figure 14 : Translation in the pre-modern world (Mallet, 2017)

3.1.1. Process of translating ancient texts into Arabic:

the establishment of institutions like the House of Wisdom, facilitated translating ancient texts into Arabic was very easy, as it was a gathering place for scholars from different backgrounds and places, including Persians, Muslims, and Christians. Their work was united and shared in translating texts from Greek, Indian, and Persian sources into Arabic. The Abbasid rulers, particularly Caliphs Harun al-Rashid and al-Ma'mun, provided significant patronage for these efforts, recognizing the importance of translation in advancing knowledge and culture.

The translation process was meticulous and involved several steps. Initially, translators would select texts based on their relevance and potential impact on Islamic scholarship. These texts were often translated from Greek, Persian, or Syriac intermediates into Arabic. Depending on the subject matter, specific translators were assigned to ensure accuracy and expertise. For example, mathematical and engineering works were overseen by scholars like Abu Jaafar Ibn Musa Ibn Shakir, while philosophical texts were handled by figures like Ya'qūb al-Kindi (Chekhnaba, 2023).

3.1.2. Techniques and Tools

Translators used various techniques to ensure the accuracy and clarity of their work. They would often consult multiple sources and engage in discussions to resolve ambiguities. Once translations were completed, they were copied by skilled scribes and bound into books. These books were then catalogued and they were kept in secure libraries such as the House of Wisdom and made available to scholars throughout the Islamic world.

3.1.3. Impact on Knowledge and Culture

The translation of ancient texts into Arabic had a profound impact on knowledge and culture. It preserved ancient wisdom, facilitated original intellectual advancements, and shaped the cultural and scientific landscape of both the Islamic and Western worlds. The movement not only disseminated knowledge but also fostered cross-cultural exchange. It paved the way for later scientific and philosophical achievement in Europe during the Renaissance. (Al-Masri, & al., 2009).

3.2. Role of key Translators and Institutions (e.g., Hunayn ibn Ishaq):

Key translators like Hunayn ibn Ishaq and institutions like the Bayt al-Hikma were instrumental in the multicultural transmission of knowledge. Their efforts have been instrumental in developing many fields like science and medicine, and in preserving ancient wisdom, laying Islamic and Western intellectual traditions.

3.2.1. Hunayn ibn Ishaq and His Family:

Hunayn ibn Ishaq was one of the most influential translators of the Islamic Golden Age. He, along with his son Ishaq ibn Hunayn and nephew Hubaysh ibn al-Hasan al-A'sam, played a crucial role in translating Greek and Syriac texts into Arabic. Hunayn's method of translation was meticulous; he would first grasp the meaning of the text before rephrasing it in either Syriac or Arabic, ensuring clarity and accuracy. His translations included works by famous Greek figures such as Plato, Aristotle, Hippocrates, Galen, and Dioscorides. Ishaq ibn Hunayn continued his father's legacy, translating several philosophical texts, including pieces by Galen and Aristotle (Osman, 2012).

3.2.2. Institutions: The House of Wisdom

Bayt Al Hikma established in Baghdad expanded it during the Islamic translation movement, where it was an important centre for it and for intellectual research. The House of Wisdom attracted scholars from many places like Christians, and Muslims, who help each other to translate texts from Greek, Persian, and Indian sources into Arabic. The House of Wisdom was important in disseminating ancient knowledge and fostering original intellectual progress in fields like philosophy, mathematics, and medicine.



Figure 15 : The House of Wisdom

3.2.3. Other Key Translators and Scholars

Other prominent translators like Al-Kindi, Al-Khwarizmi, and Thabit ibn Qurra. Al-Kindi was known for his initiatives in philosophy and many other fields while the fields of algebra and astronomy were in maintenance of Al-Khwarizmi and Thabit ibn Qurra, who translated important works from Greek into Arabic. These scholars, along with Hunayn ibn Ishaq and his family, formed the backbone of the translation movement, ensuring the preservation and dissemination of ancient knowledge throughout the Islamic world and beyond (Al-Batineh, 2021).

3.2.4. Impact of Translators and Institutions:

In both the Islamic world and Europe, the work of these translators and institutions had a profound impact on the development of science, philosophy, and culture. Translations facilitated intellectual consensus, preserved ancient wisdom, and fostered genuine progress. This movement paved the way for the European Renaissance, as many of these Arabic translations were later translated into Latin, influencing European scholars and contributing to the revival of classical learning. The legacy of these translators and institutions continues to inspire achievements in science, technology, and the arts today (Elvira, 2015).

3.3. Expansion and preservation of Ancient Knowledge:

The preservation and expansion of ancient knowledge were made possible through the extensive Graeco-Arabic translation movement, mainly centred in Baghdad between the 8th and 10th centuries. Arabic translators not only saved countless Greek works in fields such as philosophy, medicine, astronomy, and mathematics—some of which are

now lost in their original Greek and survive only in Arabic—but also enriched these texts with commentary, critique, and original additions. This process not only transmitted Greek heritage but also transformed the Arabic language into a powerful tool for scientific and philosophical inquiry, Which helped in the emergence of specializations in Islamic philosophy and new intellectual developments.

3.3.1. How translations preserved Greek, Persian, and Indian knowledge

The translation movement flourished at the Abbasid Caliphate ruling, particularly during the reigns of Harun al-Rashid and al-Ma'mun. It played an important role in preserving Greek, Persian, and Indian knowledge by translating their significance texts into Arabic. These contains works from diverse fields such as philosophy, medicine, astronomy, and mathematics. The scholars of the House of Wisdom Commenced an innovative undertaking to translate numerous works from many sources into Arabic, preserving a vast treasure trove of knowledge that would otherwise have been lost and making it available to many societies in the Islamic world. The use of Arabic as a common language enabled the dissemination of these translations throughout the Middle East, North Africa, and Spain, influencing later scientific and philosophical developments in Europe during the Renaissance. The preservation of Greek knowledge, in particular, was significant, as it ensured the survival of works by figures like Aristotle and Galen, which were later transmitted to Europe through Latin translations. This movement preserved ancient wisdom and fostered original intellectual progress, shaping the cultural and scientific landscape of the Islamic and Western worlds (El-Hussein, 2023).

3.3.2. Examples of Expanded Knowledge In Mathematics and Medicine:

During the Islamic Golden Age, tremendous achievements were made in mathematics, namely in algebra, geometry, and trigonometry. Al-Khwarizmi's "The Compendious Book on Calculation by Completion and Balancing" presented systematic methods for solving linear and quadratic equations and established the foundations of modern algebra. This book was influential in Europe through Latin translations, shaping the development of algebraic methods. Abu Kamil further developed these methods, treating solutions as numbers that could be applied to other problems, thereby enhancing the flexibility of mathematical applications. Additionally, Ibn al-Haytham contributed to number theory by discovering the sum formula for the fourth power, while Thabit ibn Qurra worked on geometry, solving problems involving conic sections (Delaney, 2019).

In medicine, Islamic scholars made substantial contributions by synthesizing knowledge from Greek, Persian, and Indian traditions. Ibn Sina the author of the book "The Canon of Medicine," a comprehensive medical encyclopaedia that remained a reliable reference for centuries in the Islamic world and Europe and beyond. It covered topics like anatomy, physiology, pharmacology, and treatment methods, influencing medical education globally. Al-Razi (Rhazes) also wrote extensively on medicine, challenging prevailing theories through empirical observation and experimentation. His works were translated into Latin and became foundational texts in Western medicine, contributing to medical practices for centuries. Furthermore, Islamic physicians developed surgical techniques, including cataract surgery, and established hospitals in major cities, which served as centres for medical education and research. so these advancements and progress in this fields, they nurtured original

intellectual growth and also safeguarding old knowledge and in other hand defining and showing the cultural and scientific landscape in the Islamic and Western worlds and other regions (Espina, &al., 2023).

3.4. Impact on Islamic and European Thought:

The translation movement revolutionized the Islamic and European intellectual traditions and preserved ancient knowledge. It fostered main original thought and critical engagement and also scientific progress in many field, making it a cornerstone of the global history of ideas.

3.4.1. Influence on Islamic Philosophy and Science:

The Islamic Golden Age deeply influenced Islamic philosophy, combining Greek, Persian, and Islamic thought to create a rich intellectual legacy. Scholars such as Al-Kindi and Ibn Rushd (Averroes) had important roles in integrating Aristotelian philosophy with Islamic theology, preserving ancient wisdom while fostering original philosophical ideas that influenced European thinkers during the Renaissance. In science, The Golden Age saw advances by scholars such as Ibn al-Haytham and al-Khwarizmi in several fields, including medicine, astronomy, and optics, challenging the views of Aristotle. Institutions preserved ancient knowledge through translation, fostered discoveries during the Renaissance, and paved the way for future scientific innovations. (Nasution, 2020).

The Islamic Golden Age was characterized by intellectual curiosity and cultural exchange. Scholars and main thinkers exchanged knowledge across great distances, fostering original thought and wisdom, inspiring the technological and other achievements of our day and witnessing its enduring power.

3.4.2. Transmission of Knowledge to Europe and its Impact on The Renaissance:

Knowledge moved from the Islamic world to Europe via major routes and centers. Andalusia and Sicily(Italy) were among the most important. locations where Islamic knowledge was translated into Latin, influencing European scholars. The city of Toledo, in particular, became a hub for translation after its conquest by Spanish Christians in 1085, attracting scholars like Gerard of Cremona who translated important works on astronomy and mathematics. The Crusader kingdoms also facilitated exchanges between Europe and the Levant, with cities like Antioch serving as centres for cultural and intellectual exchange (Jing, 2024).

The transmission of Islamic knowledge played a role in enriching the European Renaissance. The translation of Arabic works into Latin introduced Europeans to the Greek heritage and the advancement of Islamic civilization in fields like mathematics, astronomy, medicine, and philosophy. This influx of knowledge contributed to the revival of classical learning in Europe, laying the groundwork for the Renaissance. Scholars like Leonardo Fibonacci, who travelled to North Africa to learn mathematics, and Gerard of Cremona, who translated works by Islamic astronomers, exemplify the influence of Islamic scholarship on European intellectual developments. The emphasis on reason, experimentation, and intellectual inquiry in Islamic science also influenced the scientific method used by European thinkers during the Renaissance (Saliba, 2007).

conclusion

The chapter has highlighted the transformative power of the Graeco-Arabic translation movement in shaping the course of intellectual history. By meticulously translating and preserving Greek, Persian, and Indian texts, Pioneering translators and institutions preserved and expanded valuable ancient knowledge through critical engagement and original contributions. This movement cemented Arabic's status as a vital language of science and philosophy, facilitating important advances in many fields in the Islamic world. Furthermore, the transfer of this knowledge to Europe played a role in ushering in the Renaissance and laying the foundations for modern Western thought. Ultimately, the translation movement is a testament to the lasting impact of cultural exchange and scientific collaboration in preserving and advancing human knowledge.

Conclusion

Conclusion

In conclusion, this thesis has explored the profound legacy of the Islamic Golden Age, a period that stands as a beacon of intellectual, scientific, and cultural achievement in world history.

By revisiting the central theme—the extraordinary flourishing of knowledge and creativity under the Abbasid Caliphate—we have sought to understand the underlying factors that enabled such a vibrant era of progress. The core problem addressed was to uncover how the unique political, social, and cultural conditions of the time, coupled with a spirit of openness and curiosity, fostered an environment where knowledge from diverse civilizations could be preserved, expanded, and shared.

The objective was to analyse not only the historical context and remarkable achievements of this era but also the mechanisms through which knowledge was translated and disseminated. Through a careful examination of the historical foundations, the scientific and cultural accomplishments, and the pivotal role of the Translation Movement, this study has confirmed both initial hypotheses: first, that the stability and inclusivity of Abbasid rule were essential to nurturing intellectual pursuits; and second, that the Translation Movement, embodied by institutions like the House of Wisdom, was critical in both safeguarding ancient knowledge and inspiring original contributions.

Ultimately, this thesis demonstrates that the Islamic Golden Age was not merely a product of its time, but a testament to the enduring power of cultural exchange, intellectual curiosity, and the shared human quest for understanding—a legacy that continues to inspire and inform our world today.

References

Abdi O. (2016). Explorations on the Abbasids Political Culture in Pursuit of Sustainable System of Governance in the Muslim World. Mediterranean Journal of Social Sciences. MCSER Publishing, Rome-Italy

Al-Batineh Mohammed. (2021). Humanized Microhistory of Translation: The Case of Modern Arabic Literature in English Translation. Jordan Journal of Modern Languages and Literatures Vol.14, No. 4, 2022, pp 981-998.

Al-Masri, Hanada. (2009). Translation and Cultural Equivalence: A Study of Translation Losses in Arabic Literary Texts. Journal of Universal Language. 10. 7-44. 10.22425/jul.2009.10.1.7.

Ammar Waham Ashor. (2018). Fundamentals of Medicine; The Golden Age of Islamic Medicine.

Andri Sam Ramli. (2024). Science and Innovation in the Islamic Golden Age and their Global Impact. Qalrah: Journal of Islamic Civilization licensed under Creative Commons Attribution-ShareAlike 4.0 International License. <https://creativecommons.org/licenses/by-sa/4.0/>

Arnold, Thomas Walker. (2018). The Caliphate. Italy: Tawasul Europe. P. 43

Baytalfann. (2023). Algorithms, Algebra & Astronomy: Muhammad ibn Musa Al-Khwarizmi. Viewed in <https://www.baytalfann.com/post/algorithms-algebra-astronomy-muhammad-ibn-musa-al-khwarizmi>

BENMOHAMED HAFIDA. (2024). Contributions of Ancient Islamic Scholars to Social Thought: A Sociological Reading of Selected Models. Volume 16, N 3, P 11-36

Bobrick, B. (2012). The Caliph's Splendor: Islam and the West in the Golden Age of Baghdad. United States: Simon & Schuster.

References

Boundless World History (BWH). (2025) Authored by: Boundless. Located at: <https://www.boundless.com/world-history/textbooks/boundless-world-history-textbook/>.

Britannica (The Editors of Encyclopaedia Britannica) (2025). 'Abbasid caliphate. Encyclopedia Britannica. <https://www.britannica.com/topic/Abbasid-caliphate>

Britannica. (2025). Islamic literature. Viewed in <https://kids.britannica.com/students/article/Islamic-literature/275099>

Candela. (2025). The Islamic Golden Age. Viewed in <https://courses.lumenlearning.com/suny-hccc-worldcivilization/chapter/the-islamic-golden-age/>

Chekhnaba Imane. (2023). The Role of Arab Translators in Bridging various Cultures : Abbasid and Andalusian Eras As Case Study. Cahiers de Traduction Volume: 29/ N° Spécial (2024), p147- 175.

Deewan UAE. (2023). How the Islamic Golden Age Continues to Inspire Modern Achievements in the UAE. Viewed in <https://deewan.ae/blogs/rihla-the-journey-through-time/how-the-islamic-golden-age-continues-to-inspire-modern-achievements-in-the-uae>

Delaney Howe. (2019). Ancient Arabic Mathematics. Academic Festival, Event 64 [2020].

Dušan Nikolić. (2022). The Art & Architecture of the Abbasid Caliphate. Viewed in <https://www.thecollector.com/art-of-abbasid-caliphate/>

El-Hussein A Y Aly. (2023). The Graeco-Arabic Translation Movement. Cambridge University Press & Assessment 978-1-009-38560.

Elvira Wakelnig. (2015). The Graeco-Arabic Translation Movement and the Reception of Greek Philosophy by Arabic-Islamic philosophers in the 9th and 10th century. https://www.scm.uni-halle.de/_reporting_list/study_days/sektion4/2304089_2304199/?lang=en

Espina-Jerez, B., Aguiar-Frías, A. M., Siles-González, J., Cunha-Oliveira, A., & Gómez-Cantarino, S. (2023). The Art of Childbirth of the Midwives of Al-Andalus: Social Assessment and Legal Implication of Health Assistance in the Cultural Diversity of the 10th-14th Centuries. *Healthcare* (Basel, Switzerland), 11(21), 2835. <https://doi.org/10.3390/healthcare11212835>

Gilbert, Catherine. (2022). al-Khwārizmī. Viewed in <https://www.ebsco.com/research-starters/biography/al-khwarizmi>

Gillani, Aftab Hussain; Tahir, Mohammad. (2014). The Administration of Abbasids Caliphate: A Fateful Change in the Muslim History. *Pakistan Journal of Commerce and Social Sciences*; Lahore Vol. 8, Iss. 2. P 565-571

Izzedine. (n.d.). Great Mosque of Samarra [Photograph]. In Wikipedia. Retrieved June 2025, from https://en.wikipedia.org/wiki/File:Great_Mosque_of_Samarra.jpg

Jing, Yuhan. (2024). The Role of Renaissance History on the Development and Promotion of Culture. *Transactions on Social Science, Education and Humanities Research*. 12. 325-329. 10.62051/rp110c90.

Karima Saifullah. (2012). How Islam influenced the European Renaissance. Viewed in https://www.irfi.org/articles/articles_1601_1650/how_islam_influenced_the_europea.htm

Khan Academy. (2020). The golden age of Islam. Consulted in <https://www.khanacademy.org/humanities/world-history/medieval-times/cross-cultural-diffusion-of-knowledge/a/the-golden-age-of-islam>

Kharchoufa. (2024). How Islamic Philosophy Shaped World Thought. Viewed in <https://kharchoufa.com/en/how-islamic-philosophy-shaped-world-thought/>

Knysh, A. (2024). *Islam in Historical Perspective*. United Kingdom: Taylor & Francis. P 159.

Kumar Alok, Scott T. Montgomery. (2017). Islamic Science's India Connection <https://www.aramcoworld.com/articles/2017/islamic-sciences-india-connection>

Martyn Shuttleworth. (2010). *Islamic Medicine*. Retrieved Apr 08, 2025 from Explorable.com: <https://explorable.com/islamic-medicine>

Matt Saba. (2025). The founding of Baghdad. <https://smarthistory.org/baghdad/>

Michalopoulos, S., Naghavi, A., & Prarolo, G. (2018). Trade and Geography in the Spread of Islam. *Economic journal (London, England)*, 128(616), 3210–3241. <https://doi.org/10.1111/eoj.12557>

Micheau, F. (2015). Baghdad, an imperial foundation (762–836CE). In N. Yoffee (Ed.), *The Cambridge World History* (pp. 397–415). chapter, Cambridge: Cambridge University Press.

Nasution, Marlian. (2020). Philosophy of Science in Islamic Thought Perspective. *al-Lubb: Journal of Islamic Thought and Muslim Culture (JITMC)*. 2. 1. 10.51900/lubb.v2i1.8585.

O'Mara, Kathleen. (2022). al-Rāzī. viewed in <https://www.ebsco.com/research-starters/biography/al-razi>

Osman, Ghada. (2012). “The sheikh of the translators”: The translation methodology of Hunayn ibn Ishaq. *Translation and Interpreting Studies*. 7. 10.1075/tis.7.2.04osm.

Parvez Mahmood. (2021). Influence of the Islamic Golden Age on the European Renaissance. <https://thefridaytimes.com/09-Jul-2021/influence-of-the-islamic-golden-age-on-the-european-renaissance>

PILA. (2022). Islam's Greek Inheritance: Mathematics, Science, and Philosophy. Consulted in <https://patterninislamicart.com/islams-greek-inheritance-mathematics-science-and-philosophy>

Rudy Navarro. (2021). ISLAMIC INFLUENCES IN THE RENAISSANCE

Saliba, George. (2007). Islamic Science and the Making of the European Renaissance. 10.7551/mitpress/3981.001.0001.

Sardar Marika. (2011). Astronomy and Astrology in the Medieval Islamic World. Viewed in <https://www.metmuseum.org/es/essays/astronomy-and-astrology-in-the-medieval-islamic-world>

SELOUGHA Fayrouz. (2022). Major Historical Translation Movements in the Arab World and the Contribution of Translation in Knowledge Transfer. Literatures and languages Journal, Vol 22, N0 01, (2022), pp: 418 - 426

Shah Zia H. (2025). Quranic Inspiration and the Rise of Astronomy and Mathematics in the Islamic Golden Age. Consulted in <https://thequran.love/2025/03/11/13244/>

Shannon Stirone. (2022). How Islamic scholarship birthed modern astronomy. viewed in <https://www.astronomy.com/science/how-islamic-scholarship-birthed-modern-astronomy/>

Snell Melissa. (2019). Al-Khwarizmi Was a Pioneer in Algebra, Astronomy, and Math. Viewed in <https://www.thoughtco.com/al-khwarizmi-profile-1789065>

The Review of Religions. (2022). Introduction to a Special Edition on the Golden Age of Islam. Consulted in <https://www.reviewofreligions.org/41102/golden-age-islam/>

Usman Muniba. (2023). The Scientific advancements in Islamic golden age. Scientiamag. Viewed in <https://scientiamag.org/the-scientific-advancements-in-islamic-golden-age/>

Whyislam. (2025). Baghdad: Foundation.
<https://www.whyislam.org/baghdad-foundation/>

Wichmann Anna. (2024). How Ancient Greek Knowledge Was Saved by the Islamic Golden Age. Consulted in <https://greekreporter.com/2024/04/19/how-scholars-islamic-golden-age-saved-ancient-greek-knowledge/>

Wilbur R. Knorr., Jeremy John Gray., John L. Berggren. (2025). mathematics: References & Edit History.
<https://www.britannica.com/science/mathematics/Mathematics-in-the-Islamic-world-8th-15th-century>

Williams John Alden. (2015). The History of Al-Ṭabarī Vol. 27: The ‘Abbāsīd Revolution A.D. 743-750/A.H. 126-132. (2015). United States: State University of New York Press.

Willinsky John. (2018). The Translation Movements of Islamic Learning. The Intellectual Properties of Learning: A Prehistory from Saint Jerome to John Locke Chicago: University of Chicago Press.

Yvette Brazier. (2018). Why was medieval Islamic medicine important? Viewed in <https://www.medicalnewstoday.com/articles/323612>

Webography

Web 1 :

https://media.licdn.com/dms/image/v2/C5112AQH4GkMMrN9GDg/article-cover_image-shrink_720_1280/article-cover_image-shrink_720_1280/0/1564248502117?e=2147483647&v=beta&t=ul_EgFtToAr36BU5PErt0XC6Wlk1UBCwNa1uPyrMLK8

Web 2 :

<https://www.worldhistory.org/img/r/p/1500x1500/12003.png.webp?v=1711591923>

Web 3: <https://cdn.britannica.com/34/1034-050-DBB97C97/Greek-expansion.jpg>

Web 4 : <https://cdn01.eavartravel.com/2023/1/3fdda75b-7a74-4528-a829-98316bfa95ed.jpg>

Web 5 : https://timemaps.com/wp-content/uploads/2016/10/newsouthasia_2500bc.jpg

Web 6:

<https://www.google.com/url?sa=i&url=https%3A%2F%2Fuwaterloo.ca%2Fmath%2Fnews%2Ftop-8-facts-about-islamic-mathematician-al-khwarizmi&psig=AOvVaw37rnDq0ksFCO35kyh2VuK9&ust=1748093624398000&source=images&cd=vfe&opi=89978449&ved=0CBQQjRxqFwoTCMj63bDauY0DFQAAAAAdAAAAABAE>

Web 7:

https://ucsc.maps.arcgis.com/sharing/rest/content/items/cb207bb340474316907b2eeefc992044/resources/_0j_fhFcm7zqVbGxwMkh5.png?w=400

Web 8 :

https://static.wixstatic.com/media/243c32_7c201406b0a841b68d86cea5cfefe14c~mv2.jpg/v1/fill/w_639,h_425,al_c/243c32_7c201406b0a841b68d86cea5cfefe14c~mv2.jpg

Web 9 :

https://www.astronomy.com/uploads/2021/09/Istambul_observatory_in_1577.jpg

Web 10 :

<https://mlrbkokw5d5x.i.optimole.com/cb:M4HN.4c92f/w:1920/h:946/q:auto/f:best/ig:avif/https://merchantsofthecaliphate.com/wp-content/uploads/2025/01/article-medicine.jpg>

Web 11: <https://www.architecturecourses.org/sites/default/files/2025-01/ornamented-ceiling-islamic-architecture.webp>

Web 12:

<https://upload.wikimedia.org/wikipedia/commons/thumb/2/2f/Atauriques.jpg/1200px-Atauriques.jpg>