A Study on the Muslim Scientists and Innovators Across the World

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***Abstract*- Almost every field of study may claim a golden age of Islamic scholarship. Islam's central text, Al Quran, places great value on learning. The ancient Muslim scholars were well aware of this directive from Allah s.w.t. and were deeply attracted by it. They made a lot of progress in the realm of knowledge and came up with many of concepts and hypotheses. Many branches of medicine owe a great deal to the contributions of Arab and Muslim scholars who were among the first to treat patients and conduct procedures. This article examines the outstanding doctors from the 10th to the 13th century, shedding light on the underappreciated contributions of Arab and Muslim scholars to the development of ophthalmology. Many of the concepts that constitute the basis of contemporary science were developed by scientists in the Islamic world, who relied on the work of their counterparts in Greece, India, Persia, Egypt, and China. The translation of mathematical, medicinal, and astronomical works into Arabic from their original languages is one of the Islamic world's most important contributions to contemporary science. This presentation will make an effort to illuminate some recent publications by Muslim academics. It is anticipated that modern Muslim cultures and academics would be motivated by the stories of these Muslim heroes and the achievements they made.**

Keywords: Islam, Arab and Muslim Scholars, Innovators, Scientists, Modern Science, Islamic world, etc.

I. INTRODUCTION

Muslims see history as a sequence of events that has shaped their conception of time. Knowledge and 'realisation' of these beliefs take precedence over the development of individuality and adaptability. In place of a meandering river, Islam's defining emblem is the unmovable and eternal dice of the Kaaba. Islam's central revelation is on the concept of unity, which permeates all of Islamic art and scholarship. Just as all the sciences that may rightly be termed Islamic disclose the oneness of Nature, the Alhambra and the Paris Mosque both carry the plastic means by which one might anticipate the Divine Unity revealing itself in multiplicity. "It could be argued that the purpose of Islamic studies as well as mediaeval and ancient cosmological studies is to demonstrate the interconnectedness and oneness of all things in the universe, with the hope that man will be guided to the oneness of the Divine Principle, of which Nature is a reflection."

A fascinating tale of new discoveries in pure and applied science, technical progress, and entrepreneurial energy, the history of Islamic engagement in these fields forms the lively and fundamental foundation of contemporary scientific, technological, and commercial practices. Capturing knowledge from other cultures, amassing their unique and important contributions, and spreading it further via commerce, cultural exchange, and education: this is the tale of the development of Muslim science.

There are two common points of departure for discussions of the current state of science in the Islamic world: the impressive legacy of the 'golden age' of Islamic civilization (roughly the middle eighth to middle thirteenth centuries) and the 'scientifically lagging' present-day state of science in the Islamic world. Comparisons and contrasts between the ancient and contemporary perspectives are common. Several variables, including those from history, politics, culture, and the economy, have been proposed as explanations for the seeming fall. An environment favourable to scientific inquiry and technological development is essential for reversing this tendency. It has been suggested that free thought and independent analysis are crucial components of such an environment, as are a supporting government and a competitive financial market.

II. ISLAM AND SCIENCE

Both scientific study and religious belief are strategies of learning about and making sense of the world around us. Both give a framework for interpreting the world around us, despite major disparities in approach and substance. There is a close relationship between science and Islam. Islamic teachings not only value but actively promote scientific inquiry. To be sure, Islam acknowledges the importance of science to human existence. This is quite strange. Conventional wisdom is that religious people see science as a threat. Didn't science and religion fight each other for a long time? Didn't the Church want to have Galileo burned at the stake? However, the conflict between science and religion was a uniquely Western phenomenon. In Islam, such open hostility would be unheard of. Islam, on the other hand, has always supported the study of science. Even though he couldn't read or write, Muhammad stressed the need of scientific study in understanding the tangible world. He maintained that Islam represented a society that placed a premium on learning and education. He said, ‘An hour's study of nature is better than a year's prayer,’ indicating that he preferred scientific inquiry to religious observance. This is why he told them to ‘hear the scientist's words and teach the principles of science to others’ and ‘travel even as far as China in the pursuit of knowledge.’

From the seventh through the fifteenth century, when Muslim civilisation was at its peak, scientific inquiry was driven by the faith of its practitioners. The modern Muslim world's poverty and underdevelopment may be traced back to its historical rejection of scientific inquiry. A genuine infusion of the scientific spirit is necessary for Muslim cultures to experience a rebirth of Islam and the subsequent formation of a contemporary Islamic culture.

There is much evidence in early Muslim history of the intimate link between Islam and science. "Religion inspired the earliest pursuit of scientific understanding." The lunar Islamic calendar (which required seeing the new moon clearly) and the need to accurately determine the time for daily prayers and the direction of Mecca from anywhere in the Muslim world sparked a keen interest in celestial mechanics, optical and atmospheric physics, and spherical trigonometry. Algebra was a key component in the creation of the Islamic rules of inheritance. Intense interest in geography, map building, and navigational equipment was sparked by the religious obligation of undertaking a yearly pilgrimage to Mecca.

The collapse of knowledge in Muslim civilisation has been the subject of several explanations. People have pointed fingers at Islamic law, Muslim families, and a lack of protestant ethics in Muslim societies. Islam itself has been criticised because of its negative association with development and scientific inquiry. Neither of these explanations holds water. The harsh reality is that Muslims have knowingly and intentionally rejected rational thought in favour of religious dogmatism and unthinking conformity. Ijtihad, or systematic original thought, an essential part of the Islamic worldview, was the driving force behind the scientific spirit of Muslim culture. To put it another way, the religious experts, who have a privileged position in Muslim culture, were worried that the endless ijtihad would threaten their authority. They were particularly troubled by the fact that academics in the natural and social sciences were held in more esteem than theologians. Together, they shut down ‘the gates of ijtihad,’ arguing that the future of Islamic scholarship lay in taqlid, or the replication of the ideas and works of previous scholars. This was, ostensibly, a religious decision. But since Islam is a deeply integrated worldview, in which everything is tied to everything else, it had a catastrophic effect on all methods of investigation.

The future of Muslim cultures depends on their connection with science and study, just as the spirit of Islam in the past was characterised by its scientific activity. Muslims must make a concerted effort to re-enter a tradition of methodical, creative thought known as ijtihad. Bring science to the forefront of Islamic culture. First, Muslims need to understand that scientific research seldom yields immediate results. Science, and the scientific temper it requires, cannot be purchased or exchanged. Science has to be relevant to the needs and requirements of a people, and this means it needs to originate from inside a society. Rolling up one's sleeves and returning to the lab is essential. Science can only thrive in Muslim societies if it has an impact on and improves the lives of average Muslims.

III. CONTRIBUTIONS OF THE MUSLIM AND ISLAMIC SCIENTISTS TO THE WORLD

There were many different languages, cultures, and religions represented under the Islamic Empire. The Muslim conquests outside of Arabia brought them into contact with people of many other religions and civilizations. As a result, the Islamic Empire included not just Muslims from three continents, Arabs, Persians, Turks, Africans, Indians, and other Asians, but also Jews, Christians, and other religions.

Consequently, under the protection of Islam, academics of all religions collaborated to create an original culture of learning. The next few paragraphs will discuss and analyse the contributions made by Islamic thinkers to every single important area of science.

The prophet Muhammad (p.b.u.h) was sent to the Arabs in the seventh century A.D. After his death, Islam quickly spread over the Arabian Peninsula, completing its conquest within a decade. From Al-Hamrah in what is now Spain to the frontiers of China, Islam expanded rapidly over the course of a century. Islam brought together several branches of knowledge, including physics, philosophy, and religion. Both Allah (pbuh) and Muhammad (pbuh) emphasised the importance of education and learning from others' experiences in the holy Quran and the Sunnah, respectively. "This is what propelled Muslims to such tremendous heights in the fields of science, medicine, mathematics, astronomy, chemistry, philosophy, art, and architecture." Several decades after the Hijrah, Muslim scholars began to acquire Greek expositions and to study and convert them into Arabic. They did extensive analysis, compilation, approval, and expansion of Greek philosophy and science. The subsequent period, known as the Golden Age of Islam, lasted for nearly two centuries after this one. Many of Islam's great scientists are found here, along with the tens of thousands of books they authored throughout a wide range of scientific disciplines.

Muslim scholars have made significant contributions to many fields of study, but this lecture will focus on a select few in which they are often regarded as pioneers.

- Thabit ibn Qurrah Alharrani (823–900 A.D.): The first occlusive therapy for lazy eye (amblyopia) was reported by Thabit. One of his most important contributions to ophthalmology was his recommendation, a major advance at the time, of covering the healthy eye with a patch in order to strengthen the lazy eye by diverting the 'visual spirit' there.
- Hunayn ibn Ishaq Al-Abadi (808-873 A.D.): One Al-Abadi, a scientist from Baghdad, Iraq. He drew the earliest known picture of the eye, optic nerve, and its six muscles, and produced the first Arabic scientific comprehensive textbook on ophthalmology. Both Latin and English versions of the book were created. Not only was he an expert in medicine and ophthalmology, but he also translated several works on the subjects of medicine, botany, and mathematics. Besides his native Syriac, he spoke Arabic, Persian, and Greek fluently.
- Sadaqah Al-Shazhili (1370 A.D): Al-Shazhili was a scientist from Egypt. He was the author of the last ophthalmology textbook of the late 14th century when the Mongolian invasion was responsible for the end of the Islamic Golden Age in Bagdad.
- Ala Al-Din Abu Al-Hasan Ali ibn Abi-Hazm Al-Qarashi (Ibn Al-Nafis) (1210–1288 A.D.): A scientist from Damascus, Syria, Ibn Al-Nafis made several important contributions to medicine. He is credited with the discovery and explanation of pulmonary circulation. In addition, he contributed to ophthalmology. Ibn Al-Nafis was probably the first to explain the difference between corneal laceration and abrasion, and the pupillary reaction during an acute attack of glaucoma. In addition, to avoid contamination, he refused to perform cataract surgery on both eyes at the same time.

IV. SUBJECT WISE CONTRIBUTION OF MUSLIM SCHOLARS

4.1 Mathematics

Abu Wafa Muhammad al-Buzanji: Abu Wafa Muhammad al-Buzanji was born in the year 940 A.D. in the city of Buzjan, Nishapur. During his life, he achieved considerable success in mathematics and astronomy at Baghdad, where he ultimately passed away in 997 A.D. In particular, Al-Buzanji made significant contributions to the fields of geometry and trigonometry in mathematics. The opening of the compass, the construction of a square equivalent to other squares, regular polyhedral, the construction of a regular hexagon taking for its side the equilateral triangle inscribed in the same circle, the constructions of parabola by points, and the geometrical solution of the equations x4 = a and x4+ax3 = b are all examples of his contributions to geometry. Trigonometry made significant progress thanks to Al-contributions. Buzanji's He pioneered proof that the sine theorem applied to all triangles on a sphere. His innovative method of compiling sine tables yields an accurate answer for sin 30 down to eight decimal places. He also thought of sidetracks and made plans for tables. For the first time, he revealed who the secant and the cosecant were. Most of his mathematical and nonmathematical writings have been lost or remain only in altered versions. Rich comments on Euclid and al-Khwarizmi were included among his many works. Modern trigonometry may trace its roots back to him in significant ways.

Abu Abdullah al- Battani: It's no surprise that Abu Abdullah al-Battani (862-929 A.D.), the son of a scientist, would go on to become a renowned astronomer, mathematician, and astrologer in his own right. He is widely regarded as one of Islam's most brilliant astronomers. When it came to mathematics, al-Battani was the first to use cotangents instead of Greek chords, and he also developed the idea of cotangents and gave us a degree-based table of them. Several works on astronomy and trigonometry were written by him.

Mohammad Bin Ahmed: Zero, or sifr, was created by Mohammad Bin Ahmed in the eleventh century. Thus, a revolution in mathematics was born out of the need to abandon the awkward Roman numbers. This led to breakthroughs in astronomy and geography, as well as improvement in the computation of the programme of the worlds. The numeral systems used in Muslim mathematics have their origins in the hexadecimal system of ancient Babylon and the decimal system of mediaeval India. Each of the 10 symbols in the decimal system could represent either the relative or absolute value of a number, and Muslims used this method to build sophisticated mathematical models. Muslims developed several original strategies for doing multiplication, including ways for verifying by casting away nines and decimal fractions. As a result, contemporary mathematics and its application in the natural and applied sciences owe a great deal to the work of Muslim academics who built upon and repositioned earlier work.

Ghiyath al-Din al- Kashani: It was in the late fourteenth century that the great mathematician Ghiyath al-Din al-Kashani lived. He put his knowledge of computing and number theory to use. Using a polygon of 805306368 sides as an approximation to the circle, he calculated the value of 2pi to sixteen decimal places in 1424. His work 'Miftah-ul-Hissab,' or 'The Calculators' Key,' is considered to be among his most significant contributions since it defines a method for determining the fifth root of any given integer. Until the early 1700s, the book was required reading in Persian classrooms. A later stage in his life saw him go to Samarkand at the request of the monarch to contribute directly to a new scientific school and observatory and to collaborate on research with other experts of the period. Kashani also documented an accurate approximation of sin using the solution of a cubic equation.

Muhammad bin Musa al-Khwarizmi: Algebra was created by Muhammad bin Musa al-Khwarizmi, the first famous Muslim mathematician, and later expanded upon, especially by Umar Khayyam. Through Spain, Arabic numbers and mathematics of AlKhwarizmi made their way into Europe through Latin translations. Named after him, the term 'algorithm' was coined. Al-Khwarizmi, who was born in the year 780 A.D., is often regarded as the founding father of contemporary algebra. Sine, cosine, and trigonometric tables he created were adopted by Westerners. Hissab al-Jabr waal-Muqabalah (The Calculation of Integration and Equation) was the standard textbook on algebra in European colleges until the 16th century. Al-Jabr is the collection of unknowns on one side of an equation, while al-Mukabalah is the collection of knowns on the other. Six other sorts of equations were also described by him: nx = m, x2 = nx, x2 = m, m+x2 = nx, m+nx +x2, and x2 = m+nx. In addition, he used geometric reasoning to explain why x2+21=10x. The use of Arabic numerals, the decimal system, and the introduction of zero were all assisted by Al-Khwarizmi. It was his work and name that were distorted to create the terms Algebra and Algorithm. A fascinating aspect of this math book is that it uses Islamic inheritance law examples extensively. Together with a few others, he was the first to map the world under the reign of al-Mamun.

Muslim academics contributed to the advancement of logic in the creation of mathematical concepts and connections, and they also developed a practical method of numeration based on zero that was destined to lead to the solution of equations. This was the first step taken by Muslims on the path that would ultimately lead them to mathematical modelling and the use of such modelling to evaluate their hypotheses. Eventually, Spain and Sisley brought this method back to Europe.

4.2 Medicine

Ibn Sina (980- 1037) and Al-Razi (865-925): Ibn Sina and Al-Razi were two Muslim doctors who gained prominence in Europe at this time. "Ibn Sina committed his life to learning about and improving health via several scientific disciplines." As Avicenna, he became famous across Medieval Europe for his work in establishing free hospitals and developing remedies for ailments utilising herbs, hot baths, and even major surgery. Until the rise of modern science, medical schools throughout Europe relied on his influential treatise The Canon of Medicine, which was first written in Greek and then translated into Latin (Beshore, 1998; Meyers, 1964). All of the medical knowledge of the Greeks was collected in the Canon of Medicine, with Arabic interpretations and additions. In his role as a practising physician, Al-Razi, also known in Latin as Rhazes, had keen abilities of observation and documented his findings in around 184 writings. Among Al-works, Razi's Treatise on Smallpox and Measles 'passed through forty editions between the fifteenth and nineteenth century,' having been translated into Latin, then English and other European languages (Turner, 1995). More than that, he set up mental health facilities with dedicated wards, making it possible to conduct the first clinical studies of mental illness. The Christian belief that these illnesses were caused by demons and witchcraft was disproved by Al-inclusion Razi's of notions regarding human conduct; he was a pioneer in the study of psychology.

About 99 works were written by Ibn-Sina, covering topics such as philosophy, medicine, geometry, astronomy, religion, and philosophy. Ibn-other Sina's major work is the Kitab al Shifa (Book of Healing), in which he categorises healing alongside ethics, economics, and politics in addition to the more traditionally scientific fields of mathematics, physics, and metaphysics (Meyers, 1964).

Abu'l-Qasim al-Zahrawi: In the 10 and eleventh century, Abu'l-Qasim al-Zahrawi, better known in Europe as Abulcais, wrote a series of influential surgical treatises in Andalusia. His medical almanack Kitab al-Tasrif (Book of Concessions) was widely utilised by both Muslims and Western European medical professionals once it was translated into Latin. Ibn Zuhr, better known by his pen name Avenzoar, was a Muslim Spanish physician whose anatomical writings greatly impacted mediaeval European medicine. He lived in the 12th century. Consequently, experts from the Islamic world made significant contributions to medicine, both by building on the foundation of ancient knowledge and by making groundbreaking new discoveries. They also created hospitals to conduct detailed observations to back up their hypotheses.

Ibn An-Nafīs: By the 12th century, Muslim doctors had published a plethora of works in the fields of medicine and science, including encyclopaedias, medical biographies, writings on medical ethics, and works on specialised disciplines like ophthalmology. Blood circulation ideas put forward by Galen were disproved by Ibn An-Nafs. He proposed a model for how blood moves between the heart and the pulmonary (or 'lesser') circulation system. Three decades later, in 1553, a Spaniard named Miguel Serveto (Michael Servetus) put up an analogous hypothesis (Meyerhof, 1935). Ibn An-thesis, Nafs's which dates back to the 1300s, was generally disregarded. However, he did pave the way for Harvey's research that eventually discovered blood flow in the human body. Medical facilities were first founded by Muslims, who were well-versed in the fields of medicine and surgery. Nothing from antiquity or the world outside the Islamic Empire could compare to these organisations. Most hospitals in Medieval Europe were affiliated with monasteries or other religious institutions. Damascus, Syria, was the site of the first hospital to be constructed in the Islamic world, in the eighth century. This hospital had separate wards for boys and girls, as well as specialised areas for internal disorders, surgery, orthopaedics, and other conditions. We may thank these facilities for inspiring the modern hospital concept (Turner, 1995).

4.3 Astronomy

Islamic mathematicians included astronomy among the fields of study. Muslims uncovered old astronomy writings and then translated them into Arabic. The authors of these scholarly tomes conducted follow-up observations to back up the conclusions they had drawn. Ptolemy, a Greek astronomer, created a hypothesis concerning the orbits of the moon and planets and declared Earth to be the universe's fulcrum. Errors in his observations led him to impute extra motions to the planets, which he then attempted to explain away. For example, Al-Khwarizmi was one of the first academics to compile a comprehensive astronomical table (zij). To determine where the planets and stars were in the sky, astronomers used this table. As a result, every astronomer prepared his or her own zij, vying for precision (Beshore, 1998). A thorough account of Ptolemy's Almagest was written by Al-Farghani in the ninth century and was utilised throughout Europe and central Asia for the following 700 years (Beshore, 1998). This was the first step toward using actual data to back up scientific claims and hypotheses. The notion of uniform circular motion that permits the planets to travel in epicycles was inherited by Muslim philosophers and astronomers from the Ptolemaic system. The epicyclic motion, however, was finally disproved by Muslim astronomers since it went against the notion of uniformity of motion. "A Persian astronomer named Al-Tusi proposed a model of ‘epicyclic motion that includes a mixture of movements each of which was uniform with regard to its own centre’ in the thirteenth century." This model is known as the ‘Tusi Couple’ (Turner, 1995, p.68). Ibn al-Shatir, an astronomer from the 14th century, used this model to explain the movements of the planets. Verifying theoretical astronomy by systematic observations began with Ibn al-theories. Shatir's.

Ibn al-Shatir: Some 150 years later, Copernicus would be credited with a hypothesis very similar to Ibn al-Shatir's (Sabra, 2002). Whether or whether Copernicus saw the fourteenth-century manuscript by Ibn al-Shatir that illustrates his theory of planetary motion when he was in the Vatican library in Rome is a topic of active study (Saliba, 2002). Copernicus' Commentaries include a graphic that is very similar to that of Ibn al Shatir, which leads to this conclusion. Copernicus presented his sun-centered planetary model using the same idea of motion that had been developed by Ibn al-Shatir for use in an earth-centered model. This spurred the creation of competing models, which in turn made it possible to put them to the test empirically. To what extent these two men were connected in their work is debatable, but it is important to recognise the role that Muslim innovations in astronomical theory played in the evolution of the field over time (Turner, 1995). During Europe's Renaissance and Enlightenment periods, these developments sparked brand-new lines of inquiry. As a distinct subject from spherical astronomy, al-Tusi, the astronomer of the thirteenth century, is credited for separating trigonometry. Therefore, astronomers could use this new set of mathematical concepts and connections to more accurately compute the distances and orientations of points on the celestial spheres.

Theoretical and computational planetary astronomy, spherical astronomy and time keeping, instrumentation, and folk astronomy: all these were areas of study pursued by Muslim experts. Until studying Muslim instruments in depth, King (2004) concluded that ‘mediaeval European instrumentation was significantly beholden to the Islamic tradition,’ and that ‘only after ca.1550 did European instrument-makers produce technological breakthroughs that were not known to Muslim astronomers earlier.’ (King, 2004).

4.4 Physics

The natural sciences of the early Muslims relied on the writings of the Greeks, who relied on pure philosophy in an effort to comprehend nature without resorting to experiments, in contrast to all other disciplines that evolved and developed over the passing of countries and civilizations. On the other hand, Muslim scientists made no compromises in their pursuit of this foundation, and their achievements in physics were so delicate and profound that they almost gave the impression of establishing a new discipline. They instead anchored physics on experimentation and induction, rather than philosophy, speculation, or random thinking. Muslim researchers analysed the birth and spread of sound. They were the first to recognise that the bodies that produce sound have an effect on the sound, and that sound travels through the air in the form of circular waves. Muslim scientists were also the first to classify sounds into several categories; they proposed that animals' noises vary depending on their neck length, throat breadth, and larynx anatomy. It was also initially recognised by Muslim scientists that an echo is produced when air travels at great speed and strikes a tall mountain or wall. It is impossible to get an echo reflection because of how near everything is.

Abu al-Fath Abd al-Rahman Mansour al-Khāzini: In particular, Abuul Fath Al-contributions Khazni's to the fields of dynamics and hydrostatics have shocked those who have come after him. His ideas on kinetics are still being used in calculations at academic institutions. A few examples are the Impulse Theory and the Obliquity and Inclination Theories. In kinetics, both of these ideas were crucial. A great number of scientific historians consider Al-Khazani to be the greatest physicist who ever lived. He spent a lot of time on hydrostatics and even invented a way to measure the density of fluids. The problem of the body's resistance to water was something he investigated further. To estimate the specific gravity of various solids and liquids, Al-Khazani used the same device as his great master Al-Beruni. Al-precise Khazani's measurements shocked his contemporaries and successors. Air, as Al-Khazini noted, has weight and the ability to propel objects through the air, and the weight of an item in the air is less than its true weight and its compressed weight depends on the density of air. It's worth noting that these investigations paved the way for the development of technologies like the barometer (a device for measuring pressure), air vacuums, and pumps.

Abual-Rihan Al-Beruni: The famous scientist Al Biruni calculated the individual densities of eighteen different varieties of precious stones. A body's particular density corresponds to the amount of water propelling it, a law he developed. He also used the concept of communicating vessels to explain the flow of water from geysers and artesian wells. Shadows, one of al-numerous Biruni's works, is often considered to have been composed by the scholar sometime around the year 1021. The book covers a wide range of topics, from the Arabic terminology for shades and shadows to gnomonics, the development of the tangent and secant functions, their use in the astrolabe and other instruments, the solutions to various astronomical problems based on observations of shadows, and the times of Muslim prayers as determined by shadows. It is impossible to understand the development of mathematics, astronomy, and physics without the information provided by the study of shadows. The use of three rectangular coordinates to define a point in three-dimensional space, as well as notions that some see as anticipating the use of polar coordinates, are also included. Hydrostatics and precise weight measurements were among the physics topics al-Biruni investigated. He established the correlations between the densities of various metals including gold, mercury, lead, silver, bronze, copper, brass, iron, and tin. Combinations of integers and numbers of the pattern 1/n, where n = 2, 3, 4,... 10, were how Al-Biruni presented the findings.

V. CONCLUSION

From the eighth through the sixteenth centuries, Muslims made significant advances in science, technology, and business. Muslim scholars did more than just preserve old knowledge; they also reworked it into significant advances in science and technology. Contributions were mostly made in the following areas: astronomy, chemistry, mathematics, philosophy, geography, and physics. By sharing information, they helped establish a link between the Arab world and other areas of the globe, such as the Far East, the Middle East, and Europe.

It is too soon to make final findings, but studies are now being conducted on the utilisation of particular works or the thoughts and writings of specific writers. More research is required to fill in the gaps in our understanding of the scientific knowledge that was transmitted from ancient Greek libraries to the Islamic world, culminating in the eighth and ninth centuries (Sabra, 1996; Sabra, 1987), and of the translation and transmission of Islamic scholarly works to Europe in the twelfth and fourteenth centuries. As luck would have it, several European libraries still have collections of Arabic manuscripts. Since the 10th century, Muslim and Arab scientists have been at the forefront of the fight against blindness. We conclude that the Muslim doctors of the 10th through the 13th centuries were hundreds of years ahead of their time and contributed significantly to the development of ophthalmology and other medical specialties.

As a result of early Islamic knowledge, Muslim communities may embrace the spirit of scientific advancement and success. Because Islamization of Knowledge promotes integration between the beautiful heritages of Islam and modern science by adopting a certain methodology, they could receive and adapt the technological advancements of the West to address their own conditions and contribute their own discoveries in the education sector. "But undoubtedly, a certified Islamized expert or institution is needed, one that has a deep familiarity with both the Islamic viewpoint and contemporary scientific practises." If open inquiry, appropriate incentives, institutional backing, and the advantages of research are promoted, scientific and technological advancements may once again flourish among Muslims and other peoples.

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