

THE CONTRIBUTION OF ISLAMIC CIVILIZATION TO THE SCIENTIFIC AND TECHNICAL ADVANCEMENT OF THE WORLD

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ABSTRACT: Despite backward situation of Arab Peninsula in the Age of Ignorance, that is, pre-Islamic era, Muslim researchers and intellectuals endeavored to enter the realm of science by displaying their talents and introducing their innovations. This article describes the geographical expansion of Islam, the progress of Islamic civilization with its advances in areas such as medicine, physics, astronomy, and history, as well as its impact on western civilization. It demonstrates how Muslims were able to achieve a remarkable civilization and benefit other societies, particularly the western world.

Introduction

The geographical expansion of the Muslim world and the development of Islamic sciences and civilization are historically stunning and glorious. This occurred at a time when the western world was overtaken by the scientific stagnation of the Middle Age. Inspired by Islam and monotheism, Muslims who had entered other territories outside the Arabian Peninsula tried firstly to acquaint themselves with

the cultural heritage of the new lands. Due to their thirst for learning and knowledge, they turned their focus on science, literature, and the arts.

Muslims significantly contributed to human knowledge in various fields through their innovations. This contribution was so great that Islamic civilization has been the pioneer of the scientific, intellectual and cultural genius for a long period of time, with the West benefiting from its great achievements.

The Geographical Expansion of Islam

The mission of Prophet Muhammad began in the Arabian Peninsula in Mecca in 7th century A.D. There, the Holy Prophet invited people to Islam for 13 years. In doing so, various kinds of hardships were inflicted on him by the pagans of Quraysh. After the polytheists planned in *Dār al-Nadwah* to kill him, the Holy Prophet had to migrate to Medina. Thereafter going through a decade of challenges including battles and after 23 years of efforts to invite people to Islam and propagate it, he could finally lay foundations for an Islamic civilization.

Before long, Islam transcended the boundaries of the Arabian Peninsula. During the time of the Prophet's successors, Islam proceeded to the heart of Asia in the East and northern Africa in the West. Muslims' advance on Iran began in the time of the first caliph. Afterwards, during the time of the second caliph, Islam spread in Iran. Finally, during the time of the next few caliphs, the whole of Iran was conquered by the Muslims.

In addition, Muslims made some advances on the northern and northwestern areas of the Arabian Peninsula; that is, in the front line facing the conquests of the Roman Empire. The Muslim army conquered Syria and Palestine in 19 A.H and reached Armenia in 21

A.H. Alexandria was also conquered in the same year and Tripoli in 23 A.H. Likewise, the Muslims entered Tunisia in 27 A.H.¹ Finally crossing the strait between Morocco and Iberia (Gibraltar strait) in 92 A.H, the Muslims (Arabs and barbarians from northern Africa) entered the whole of Iberia (Andalucía – Spain, which also included the present-day Portugal) under Tariq ibn Ziyad's command. After crossing the Pyrenees, they also proceeded into the heart of France.²

The rapid spread of Islam was due to various factors. The first main factor was the Holy Qur'an; it contains teachings which promise to save the mankind. It is also based on justice, equality, and moral virtues. These very lofty principles attracted people who were suffering oppression by the emperors and considered Islam to be the call of freedom.

About the impact of the Glorious Qur'an on the individuals and society, and the fact that Muslims could achieve outstanding progress under the Holy Qur'an, the European historian, Will Durant, wrote as follows:

Thanks to the Qur'an, the Muslims' conduct and culture developed. The Qur'an saved them from illusions, superstitions, oppression, and violence. It

¹ For a detailed description of Muslims entering the Roman Empire, see Baladhuri, *Fotuh-al-Buldān*, p. 140; *Ya'qubi History*, vol. 2, p. 31; *Tabari History*, vol. 5, pp. 1775-930; *Arab History*, pp. 188-98, pp. 206-16; Shahidi, *The Analytical History of Islam*, pp. 122-26; Fayyaz, *The History of Islam*, p. 143, pp.148-51; Gustav Le Bon, *The Civilization of the Arabs*, pp. 166-77.

² See Albert Mallet & Jules Isaac, *The History of the Middle Ages*, vol. 4, pp.102-7; *The Civilization of Arabs*, pp. 274-7; Aldo Mie Lee, *Islamic Sciences and their Role in the World Scientific Development*, p.107; Gustav Le Bon, *The Civilization of the Arabs*, p. 302-60. For more information about the way Islam spread, see Harry Fozzard, *The Atlas of Islamic History*; Thomas Arnold, *The Preaching of Islam, London, 1970*. Being translated to Persian (and entitled *The History of Spread of Islam*, translated by A. Ezzati, the Publications of Tehran University,1385), this book discusses the spread of Islam in the western Asia, Africa, Spain and the European regions under the Uthmaids as well as its spread in Iran, the Middle East, China, Africa, the Malaya archipelago, etc in detail.

granted the people of the lower classes honour and esteem. Likewise, it made society replete with such justice and piety that no parallel can be found for it. At the same time, the Qur'an urged them to make progress which led to making such a progress that was unique in history.³

Aside from the Glorious Qur'an, another factor contributing to the spread and progress of Islam is its compliance with human nature. Islam does not merely consist of religious rituals, it consists of both religion and the law. All public and private aspects of life are taken into account in it and for each one some guidelines have been provided. In Islam, there is a relationship between human nature and religious obligations. In these two fields, all legal applications are interconnected.⁴ Thus, the consistency between Islam and human nature facilitates people's inclination to it.

According to some European scientists, the simplicity of the Islamic principles and teachings contributed to its spread.⁵ In the introduction to his translation of the Holy Qur'an, George Sale pointed out:

The main reason behind the progress of Islam is the unaffected simplicity of its teachings. This contributed to the spread of Islam and sowed its seeds more than the swords of warriors did. Islam influenced the Christian world greatly and established a spiritual religion in Asia.⁶

³ Durant, *The History of Civilization* (The era of Faith, 2nd section, Islamic Civilization), p. 52.

⁴ Vaglieri, *The Call of Islam from the heart of Italy*, p. 94.

⁵ For instance, "Through its simplicity, Islam is distinguished from other religions and has spread quickly since it is really easy to understand its injunctions and perform its religious obligations, also it does not include complicated and unfamiliar issues." (See Albert Mallet & Jules Isaac, *The History of the Middle Ages*, vol. 4, p. 110).

⁶ Salmasi-Zadeh, *The History of the Qur'anic Translation in the World*, p. 69.

Professor Montet referred to the “rationality of the principles of Islamic beliefs” and its resultant merits in its propagation. He writes:

In the best sense of the word, Islam is basically rational both ideologically and historically. The definition of the term “rationality” as a thought system that imparts the religious beliefs to the principles confirmed by the intellect corresponds to Islam completely...To a Muslim, the religious principles come down to the belief in the unity of Allah and the prophetic mission of His Messenger ... No doubt, the simplicity and clarity of these teachings are the key decisive factor in the progress, religious activities, and propagation of Islam. These perfect principles, so pure and void of theological and intellectual sophistication; thus, so accessible and comprehensible, are in fact greatly able to permeate the human conscience.⁷

The Progress of Islamic Civilization

Under Islamic teachings and due to their turning to sciences, Muslims progressed rapidly in all different aspects of civilization including the arts, architecture, fine arts, textile industry, geography, shipbuilding, seafaring, trade, exploration, discoveries, physics, chemistry, medicine, astronomy, botany and agriculture, irrigation, music, calligraphy, urban development, book and library, religious sciences, and so forth. Through this, they founded the brilliant Islamic civilization so amazingly that orientalist admitted to the stunning progress of Muslims in various sciences.

⁷ Thomas Arnold, *The History of the Spread of Islam*, p. 302.

Will Durant, Gustav Le Bon, and Gume, are among orientalists who admitted to the brilliant Islamic civilization, its impact on Europe, and Muslims' role in scientific development.

For instance, Gustav Le Bon wrote about the reasons behind the spread of Islam as follows:

In addition to the just and benevolent treatment of people, simplicity and clarity of the Islamic principal beliefs were the main factors that caused Islam to spread. The very simplicity, clarity, and good manners made people such as the Egyptians who had been Christian since the time of the Byzantine emperors embrace Islam the moment they were invited to it. No Muslim tribe, whether victorious or defeated, was seen giving up Islam for Christianity. The impact of the Islamic civilization and politics is really astonishing. In the Age of Ignorance, Saudi Arabia consisted of some small principalities and self-willed tribes which were always engaged in civil war, murder and plunder. However, a century after the advent of Islam, the scope of religiousness expanded over the area between the Sind Sea and Andalucía. In all the countries that were under the banner of Islam, the progress was truly astounding in every aspect. This occurred because of Islamic beliefs being in accordance with natural rules and principles. They even out the general ethics and create justice, benevolence, and religious leniency in them.”⁸

In his book *The History of Civilization*, Will Durant considered the rise and fall of the Islamic civilization a great event in history and maintained that during five centuries (81- 597 A.H / 700-1200 A.D), Islam was the world precursor of power, discipline, and expansion of

⁸ Gustav Le Bon, *The Civilization of the Arabs*, p. 144

its realm, good manners, improvement of the standard of living, fair human laws, religious leniency, literature, and scientific research in medicine, philosophy, etc.

Muslim scientists acquired and perfected Greek mathematics, natural sciences, astronomy, and medicine. They also transmitted even more enriched Greek legacy to Europe. For 500 years, Muslim physicists were the pioneers of the world's medicine. European architects, blacksmiths, glass-blowers, goldsmiths in Italy, the new boom of the creative potters in Italy and France, and armorers in Spain were all inspired by Muslim craftsmen. Only the golden ages of a community's history can produce so many renowned figures in the fields of politics, education, literature, philology, geography, history, mathematics, astronomy, chemistry, philosophy, medicine, etc.; they emerged during four centuries, from the time of Harun to ibn Rushd's era.⁹

Muslims increased and advanced the knowledge they learned from Greeks through experimental studies. In the strongest sense, they invented laboratory experiments and truly pioneered objective scientific research. Scientific researches with the aim of discovering the real essence of single elements were first conducted by Muslims. The corollary of these pioneering activities was that it stimulated the forerunners of the European intellectual movement, that is, Rodger Bacon, Albertus Magnus (the great Albert), Leonardo da Vinci, and Galileo.¹⁰

It is beyond the constraints of this paper to fully enumerate the Muslim scientists with important scientific works, discoveries, and inventions in various fields of material sciences who achieved world repute.

⁹ See Durant, *The History of Civilization*, p. 322. About the greatness of Islamic civilization, see Mirhoy, *The Islamic Legacy*; Albert Mallet, *The History of the Middle Ages*, vol. 4, pp. 107-13. For more information on what scientists admitted about the Islamic civilization and science, see Muhammd Reza Hakimi, *Muslims' Knowledge*, pp. 318-20.

¹⁰ For the method of scientific research of Muslims, see Gustav Le Bon, *The Civilization of the Arabs*, p. 559-62; Hunke, *Islamic Culture in Europe*, p. 419.

However, in gratitude to their high scientific status and their role in the brilliant Islamic civilization, we refer to some of these great men in different fields and their respective specialized works.

Medicine: Ali ibn Rabben Tabari (*Ferdows-ul-Hikmah wa Manafi‘-ul-At‘amah wa al-Ashrabah*), Muhammad ibn Zakaria Razi (*al-Hawi, Mansuri Medicine, al-Judari wa al-Hasbah*), Ali ibn Abbas Ahwazi (*Kamil-u-Sanayi‘or al-Maliki*), Avicenna (*The Canon of Medicine*), etc.

Physics, mechanic and chemistry: Ali ibn Muhammad ibn Hassan ibn Heitham (*Kitab-ul-Manazhir*), Abu Reihan Biruni, Qutb-u-Din Shirazi, Abd-u-Rahman Khazeni, Kamal-u-Din Farsi, Khwarizmi (*Mafatih-ul-Ulum*), offspring of Musa ibn Shakir (*Kitab-ul-Hiyal*), Jabir ibn Hayyan, Zakaria Razi (*Sirr-ul-Asrar*).

Mathematics: Muhammad ibn Ibrahim ibn Fazari (*al-Qasidah fi Ilm-e-Nojum, Kitab-ul-Miqyas, Kitab-u-Zij ala Sunan-l-Arab, Kiatb fi Tastih-l-Korah* and translation of Sadhant = Sandhind), Muhammad ibn Musa Khwarizmi (*Algebra and Muqabilah*), Abul-Wafa Buzjani (of numerous theories and books), Umar Khayyam Neishaburi (the treatise of algebra and Muqābilah), Ghiyath-u-Din Jamshid Kashani (*Miftah-ul-Hisab*). Furthermore, figures like ibn Heitham, Avicenna, Biruni, Khajeh Nasir Tusi, Sheikh Baha‘i, Thabit ibn Qurrah, Alai‘-Din Qushchi, Ahmad Sarakhsi, etc. were well-versed in mathematics.

Astronomy: Muhammad ibn Ibrahim ibn Fazari, Yaqub ibn Tariq, Abu Mash‘ar Balkhi (*al-Madkhal-ul-Kabir*), Muhammad ibn Jabir al-Batani (*al-Zij*), Abu Reihan Biruni (*Mas‘udi Canon, a-Tafhim li Awa‘il Sana‘at-l-Tanjim*), Khajeh Nasir Tusi, etc.

History and geography: Many historians and geographers emerged and left precious works. The historians include Muhammad ibn Jarir Tabari (*Tarikh-u-Rusul wa al-Umam wa al-Muluk*), Ya‘qubi (*Ya‘qubi*

History), Abul-Hassan Ali ibn Hussain Mas‘udi (*Murawwij-u-Dhahab wa-Tanbih wa al-Isharf*), Hamzah Isfahani (*the History of Sini Muluk-ul-Arz*), Ibn Athir (*al-Kamil fi-Tarikh*), ibn Khaldun (*ibn Khaldun History*), Abu Ziad Balkhi (*al-Bad’ wa-Tarikh*), Abu Hanifah Dinwari (*al-Akhbar-u-Tawal*), Abu-l-Fida (*al-Mukhtasar fi Ahwal-l-Bashar*), Abu Reihan Biruni (*al-Athar-ul-Baqiyah*), ibn Khallikan (*Wafiyyat-ul-A‘yan*), Jalal-u-Din Soyuti (*Tarikh-ul-Khulafa*), Abu Abdillah Jahshiari (*al-Wuzara wa al-Kitab*), Ahmad Qalqashandi (*Subh-l-A‘sha*), Taqi-u-Din Maqrizi (*al-Khutat wa al-Suluk li Ma‘rifat-l-Dowal-ul-Muluk*), etc.

Likewise, the geographers include Muhammad ibn Khurdadbeh (*al-Masalik wa al-Mamalik*), Abuzaid Balkhi (*Surat-ul-Aqalim*), Abu Ishaq Istakhri (*Masalik wa Mamalik*), Mas‘udi (*Murawwij-u-Dhahab*), Muhammad ibn Hawqal (*al-Masalik wa al-Mamalik= ibn Hawqal’s travelog*), Abu Abdillah Ahmad ibn Muhammad Muqaddisi (*Ahsan-u-Taqaqim fi Mmarafat-l-Aqalim*), ibn Wazih Yaqubi (*al-Bildan*), Abu Abdillah Jaihani (*Ashkal-ul-‘Alam*), Zakaria Qazwini (*Athar-ul-Bilad wa Akhbar-ul-Ibad*), Hamdullah Mostowfi (*Nuzhat-ul-Qulub*), Ahmad ibn Majid (*al-Fawa‘id fi Usul-l-Bahr*), Yaqut Himawi (*Mu‘jam-ul-Bildan*), Baghdadi (*Marasid-ul-Ittila‘*), ibn Jabir, ibn Batutah, Nasir Khosrow, ibn Fadlan, Abu Zaid Hassan Sirafi, each of which produced travel logs and works describing the cities and natural geography of Muslim and non-Muslim lands.¹¹ Not only did Islamic civilization save the Greek legacy from annihilation and oblivion, create a pattern for it, organize it, and transmit it to Europe, but it also pioneered the experimental chemistry, physics, algebra, the present-day calculus,

¹¹ For more information about Muslim scientists in various fields (of material sciences) and their innovations and inventions, see Gustav Le Bon, *The Civilization of the Arabs*, p. 556-638; Durant, *The History of Civilization*, vol. 4, section 2, pp. 1229-33; Zeidan, *The History of Islamic Civilization*, vol. 3, pp. 551-90; Safa, *The History of the Rational Sciences in the Islamic Civilization*, vol.1; Nasr, *Science and Civilization in Islam*, pp. 38-220; Qurbani, *The History of Islamic Culture and Civilization*, pp. 182-308; Hakimi, *Muslims’ Knowledge* pp. 144-76; Hatta, *The History of the Arabs*, pp. 462-552; Ja‘fari, *Muslims in History*, pp.177-202; Aldo Mie Lee, *Islamic Sciences and their Role in the World Scientific Development*, pp.177-305; Baron Carra De Vaux, *Muslim Thinkers*, vol.2, (Geographers, mathematics and natural sciences), pp.16-100.

spatial trigonometry, and geology. Islamic civilization granted the West innumerable valuable discoveries and inventions. The most valuable one may be the method of research on natural sciences. It was the pioneering efforts of Muslims that paved the way for Europe and led to the knowledge of natural rules and dominance over nature.¹²

Sigrid Hunke pointed out that in 1000 A.D, hundreds of librarians worked in two libraries of the caliph, which included 2,200,000 books combined. These books were twenty times as many as the rolled-up books in the unique library of Alexandria at the peak of its boom.¹³

According to Hunke, in this very year Abul-Qasim compiled a book on surgery, which was the main source for those seeking information on this scientific field for many years. In addition, in this year, Biruni described how the earth rotates around itself, and al-Hassan al-Heitham discovered the rules of eyesight, experimented with the boxed camera, and on lens, convex, concave, cylindrical mirrors, and focus. Finally, in this very year while the Muslim world was moving rapidly toward the apex of its golden age, Europe waited fearfully for the apocalypse; that is, the historical, geographical, and astronomical end of the world.

At that time, the common idea among Westerners was that conducting scientific research, familiarizing themselves with nature, and exploring the world's wonders mean nothing but wasting and misusing the rational faculties.¹⁴

Laktantius (317 A.D), who taught in a church school, said, "As nobody has reached the truth yet and a lot of efforts and time might have been wasted in search for it, obviously knowledge cannot be found where science and scientific research is sought." Another Christian called

¹² Hunke, *Islamic Culture in Europe*, p. 420; Safa, *The History of the Rational Sciences in the Islamic Civilization*, p. 133.

¹³ Hunke, *ibid*, p. 352.

¹⁴ *ibid*, p. 361.

Tertolian said openly, “On Jesus Christ’s orders, after the descent of the Bible, it is not our duty to be inquisitive and acquire knowledge further than what is in the holy book.”¹⁵

Moreover, a priest closed the library of Muzayunis and put the scientists to flight. In 366 A.D during a Byzantine Caesar, this library was transformed to a church, its books were burnt, and their philosophers – charged with sorcery and magic – were persecuted. In 529 A.D, the last center of philosophy closed down in Greece. In 600 A.D, the Platini library, which was established by Augustus, was burnt. Likewise, studying the works of different doctrines, particularly acquiring mathematics, was prohibited.¹⁶

However, Muslims were very fond of books, particularly books on geometry, mechanics, medicine, astronomy, philosophy, and the like.

It was said that after Harun al-Rashid had won the battle of Amuriyyah with Byzantium (839 A.D), he agreed to make peace with Byzantium on condition that the ancient Greek writings were surrendered. After victory over Byzantium, he demanded of Michael III that all philosophical works, even though not yet translated to Arabic, be surrendered to Muslims as war tribute.¹⁷

Muslims even used to send special envoys that had great authority and enough money from Baghdad to Byzantium and India in order to collect the works and to ask scientists of other countries for help. Caliphs, viziers, and other great Muslims each had a private library. There were also numerous public and private libraries in the Muslim

¹⁵ *ibid*, p. 362.

¹⁶ *ibid*, p. 363.

¹⁷ In this regard, see Zeidan, *The History of Islamic Civilization*, p. 631; Hatta, *The History of the Arabs* pp. 381-401; Safa, *The History of the Rational Sciences in the Islamic Civilization*, pp. 42-45; Hunke, *Islamic Culture in Europe*, p. 379; Ja’fari, *Muslims in History*, pp. 94-5, 150; Ghunaimah, *The History of the Great Islamic Universities*; Shibli, *The History of Education in Islam*, p. 140.

world. Mosques and hospitals had special libraries as well.¹⁸ These books and libraries contributed to the spread of Islamic culture and civilization. The statistical information about these books and libraries can be found in various historical sources including the *Al-Fihrist* by of ibn Nadim.

The Impact of Islamic Civilization on Europe

As mentioned above, through conquering various lands (Fertile Crescent, Iran, Egypt, etc.), Muslims added vast areas to their territory. They could geographically expand the initial religious government which the Prophet had formed in Medina. Their government covered a large part of western Asia and northern Africa in addition to the Arabian Peninsula. They formed such a great government that within a short period of time most developed areas of the then civilized world were included in it.

Similarly, in terms of civilization, Muslims inherited the ancient civilizations and their heritage has dated back to the time of the Assyrians, the Babylonians, the Greeks, the Romans, the Iranians, and the Egyptians. Being fascinated with sciences, they acquired, assimilated, and modified the rational and artistic heritage in cooperation with the scholastic figures of the very conquered lands. They also developed their specific culture and civilization.¹⁹ Haskins wrote, "The first and most forceful scientific and philosophical activities of the middle age from medicine and mathematics to astronomy and alchemy were found in the territory of the Prophet."²⁰

¹⁸ In this regard, see Ghunaimah, *The History of the Great Islamic Universities*, chapters 3 & 6; Safa, *The History of the Rational Sciences in the Islamic Civilization*, pp. 48-120; Hunke, *Islamic Culture in Europe*, pp. 122-68; Qurbani, *The History of Islamic Culture and Civilization*, pp. 298-300; Zeidan *The History of Islamic Civilization*, pp. 630-40; Hatta, *The History of the Arabs* pp. 529-30.

¹⁹ See Hatta, *The History of the Arabs* pp. 154 & 223-4.

²⁰ Charles Homer Haskins, *The Renaissance of the Twelfth Century*, Cambridge, Mass, U.S.A., 1971, p. 882.

As a result of creating the really stunning and brilliant culture and civilization, the Muslim world could penetrate into the Christian world and influence it. As for the various manifestations of the penetration of the Islamic culture into Europe, Will Durant wrote:

The Islamic civilization penetrated into Europe through trade, Crusades, translation of hundreds of Arabic books into Latin and the journey of such scholars as Gerbert, Michael Scott, Adelard of Bath, etc. to the Islamic Andalus as well as by young Christians who were sent by their fathers to the Muslim countries in order to acquire knowledge and etiquette and become civilized.²¹

During many years of contact between Muslims and Christians, the impact of the Christian world was almost limited to some religious rites and war customs. As for religious rites, it is most likely that Sufism entered Islam through Christian instances of monasticism and acts of worship by Saints. The biography of Prophet Jesus Christ and his personality²² remained in the Muslims' minds; Islamic poetry and arts received attention as well.²³

In return, the Muslim world also had various influences on the Christian world. Europe learned the following from Islamic lands: various dishes, syrups, medications, weapons, coats of arms, artistic flair, industrial and commercial tools and traditions as well as rules and

²¹ Durant, *The History of Civilization*, vol.4, pp. 1229-33; also Qurbani *The History of Islamic Culture and Civilization*, p. 320. According to Washington Oruming, "The castle of our civilization was built by the science and technique of capable Muslims'. No matter where the Christian European nations are, they are indebted to Muslims." (*The Muslim World*, p. 77; Qurbani, *The History of Islamic Culture and Civilization*, p. 318).

²² Of course, Muslims paid attention to Prophet Jesus Christ mostly because according to the Glorious Qur'an, he was a divinely chosen Prophet sent to guide mankind. Accordingly, the belief in all divine prophets is among the Islamic beliefs and all Prophets are respected and revered by Muslims.

²³ *The History of Civilization*, p.319; also see Qurbani, *The Reasons of Spread of Islam and Muslims' Fall*, pp. 21-2; Pier Russo, *The History of Sciences*, p. 146.

customs of seafaring. Likewise, they borrowed many of their terms from Muslims.²⁴ Having acquired, developed, and boosted various sciences, Muslims transmitted them to Europe and prepared the ground for scientific development in the West.

The cultural and scientific influence of Islam on Europe began after the contacts between the worlds of Islam and Christianity and it increased gradually. These contacts were mostly of three types: a) the contacts established during the Crusades between Muslims and westerners; b) those which were established in Sicily; c) the contacts in Iberia (Andalucía and the present-day Spain) between Muslims and westerners.²⁵ The very recent contacts which Muslims established after the conquest of Spain and Sicily were most productive.

In order to maintain their unstable dominance over the Syrian and Palestinian coasts, crusaders proceeded towards the East in order to conquer Jerusalem. Greatly surprised, they faced a civilization superior to theirs in these lands. Despite the roughly permanent wars either with non-Christians or between Christian princes, which led to horrendous massacres by Christians, some enterprising crusaders tried to acquire parts of this civilization. Some other real scientists who stayed in the lands conquered by Christians got the chance to know a part of Arabic (Islamic) literature. They included a renowned figure, Adelard of Bath, who after a journey to the East and his stay there (in 510-37A.H - 1116-42 A.D) was so deeply influenced by Islamic sciences that this

²⁴ About the impacts of the Islamic civilizations on Europe, see Durant, *The History of Civilization*, p.319; Hunke, *The History of Islam in Europe*, pp. 419-20; Qurbani, *The History of Islamic Culture and Civilization*, pp. 309-21; Shakib-Arsalan, *The History of Islamic Conquests in Europe*, pp. 229-305.

²⁵ Aldo Mie Lee, *Islamic Sciences and their Role in the World Scientific Development*, p. 477; Gustav Le Bon, *The Civilization of the Arabs*, pp. 731-5; Durant, *The History of Civilization*, vol.4, section 2, pp. 1229-33. As for the influence of Islam in Spain and the civilization of the Islamic Spain, see *The History of Civilization*, section 1, pp. 372- 90; Joseph Mockups, *The Greatness of Muslims in Spain*, various pages.

influence can be seen in both his own works and his translations of Islamic writings into Latin.²⁶

Although the role assumed by Sicily and southern Italy in transmitting the Islamic sciences to the West was geographically limited, it was deeply influential. African Muslims disembarked in Sicily in 827 A.D / 213 A.H. In 831 A.D / 216 A.H and they conquered Palermo and then Messina in 842 A.D / 228 A.H. Finally, they conquered the entire island in 878 AD. / 265 A.H. Muslims inhabited this island without facing any serious foreign invasion until 1060 A.D / 452 A.H.²⁷

Thanks to the Muslims' control and creation of favorable conditions aimed at the spread of civilization, a unique culture was created in Sicily which existed for many years; three world scientific languages existing then were simultaneously used there. These three languages were Latin, Greek, and Arabic.²⁸ At this point, the highly active trend of translation of various works started due to which many works of Muslim scientists on different fields were translated from Arabic to Latin by Sicilian translators.

Transmission of Islamic sciences to the Christian world was deeper and more intense in Iberia, and longer compared to other places. It was in Iberia that the definite transformation to which the revival of the European sciences had to be linked was realized. The Muslim rulers' spirit of forgiveness and lenience when treating believers in other religions, particularly the Christian and Jewish scientists, caused diverse students to flock to this land. New sciences thrived during this time as a result of the penetration of Islamic sciences into the Christian world through the numerous works of translators. Muslim scientists

²⁶ Aldo Mie Lee, *Islamic Sciences and their Role in the World Scientific Development*, pp. 448-9. About Islamic civilization in Sicily, see Gustav Le Bon, *The Civilization of Islam and the Arabs*, p. 385- onward.

²⁷ Aldo Mie Lee, *Islamic Sciences and their Role in the World Scientific Development*, p. 491-2.

²⁸ *ibid*, p. 493.

and European historians agree that the flourishing of the Islamic civilization in Spain awakened the western nations and Christian Europe. It was also the origin of the present scientific and industrial development.²⁹

As for Islamic civilization in Andalucía (Spain), Gustav Le Bon said:

In the era of Visigoth, Andalucía enjoyed limited development and their culture was similar to that of the barbarians. Particularly in the last phase of their conquest, Muslims began to progress; within one hundred years, they completely cultivated and developed the waste lands, built magnificent structures and mansions, and established commercial relations with other nations, then they endeavored to disseminate sciences and crafts and translated Greek and Latin books. They had set up some schools and colleges which the Europeans made use of and benefited from for a long time.³⁰

In Córdoba, the Islamic civilization reached such a peak that in terms of scientific development, it was the honor of all cities around the world for three hundred years. One of the features of the Islamic civilization of that time was that Muslims were extremely eager to acquire the sciences and crafts; they established schools, libraries, and scientific and literary institutes and societies and they also translated Greek books. They continued to successfully master geometry,

²⁹ The European writers believe that through Spain and Sicily, Islam exerted influence over most of the western countries such that it can be said that Islamic influence on the West was greater through Spain and Sicily than through Musil, Baghdad and Cairo. They give two reasons for this claim. First, sciences and cultures of these two religions were not mixed in Syria as they were mixed in Sicily in the time of Roger II and Fredrick II. Second, while Latin Syrians always had access to the Islamic sciences, they were never able to acquire them. In contrast, Christians of the western Mediterranean acquired the sciences and crafts of Córdoba and finally Islamic Spain (*Islamic Heritage*, p. 12).

³⁰ Le Bon, *The Civilization of Islam and the Arabs*, p. 341.

astronomy, natural sciences, chemistry, and medicine. Muslim scholars achieved considerable successes in science and technology, and they could make important discoveries. Trade and industry also reached their zeniths. Minerals, weapons, silk and other fabrics, tanned leather, and sugar were produced there and were taken to Africa and the East by the tradesmen of the time. Muslims proved their talents and capabilities in public services, too. Many roads, bridges, caravanserais, inns, and mosques were built in various areas.³¹

They were superior in not only scientific and technical issues but also in morals, as Sedilo wrote:

In that era, Muslims were superior to Christians in terms of morals as well as science and technology. In all of their states and behaviors, there were such generosity, benevolence, and sacrifice the like of which could not be found in other nations. Among the characteristics that distinguished them from other nations is their respect for mankind, which is considered one of their glories.³²

A valuable human characteristic which Muslims taught or tried to teach Christians was religious leniency with believers of other religions. They treated the conquered nations so leniently that Christians set up the Inquisition in Seville in 782 A.D and in Córdoba in 852 A.D. From the many churches built during the Islamic reign, Muslims showed much respect for the religions of the defeated nations. Hence, many Christians converted to Islam even though it was not necessary because

³¹ *ibid*, p. 342. The introduction of *The History of Islamic Conquests in Europe*, p. 29. Also, see Durant, *The History of Civilization*, 1st section, pp. 372-90 & “Thought and Art in the Islamic Western Territories”, pp. 303-59. About the spread of Islam among Spanish Christians, see Thomas Arnold, *The History of the Spread of Islam*, pp. 69-105.

³² *The Civilization of the Arabs*, p. 350.

in the Islamic government, Christians and Jews enjoyed the same rights as Muslims and they could hold any position in the court.³³

The Islamic civilization had been shining in the present-day Spain, Portugal, southern France, central Switzerland, western Italy, Sicily and other Mediterranean islands, and Islam had covered all this vast area until the rulers of these Islamic territories became despotic and their power was steadily undermined. They lost their unity and turned into petty kings; as a result, they lost parts of their territory. In 1498 A.D, Ferdinand, the Christian king of Aragón, married Isabella, the queen of Castilian Spanish. This marriage led to the great political unity of two main parts of Spain, that is, Aragón and Castilian Spanish as well as their territorial integrity. This resulted in Spain becoming a powerful country. These two Christian rulers retook the Islamic conquests and the incompetent Muslim kings lost control of them. They had expanded their territory until Granada collapsed in 898 A.H / 1492 A.D. As a result, the last Islamic base in Europe was lost. Thus, this political unity put an end to the Islamic reign in Iberia. In this very year, with the provisions given to him by Ferdinand and Isabella, Christopher Columbus had set out to discover the unknown continent, which was later known as America.³⁴ The interesting point to historians is that the contract of Christopher Columbus's journey to discover the new world was signed in Santafe, which was built by Spaniards during war with Muslims six miles from Granada in 896-97 A.H / 1490-91 A.D. They were glad that it was the only Spanish city which was not contaminated by the so-called Islamic heresy.³⁵ Afterward, Portugal split from Spain and each separately began to

³³ *ibid*, p. 345.

³⁴ See Amir-Ali, *The History of Arabs and Islam*, p. 523-35; Shakib-Arsalan, *The History of Muslims' Conquests in Africa*, p. 25 of Introduction and p.25-onward; Abdul-Hadi Haeri, *The Early Confrontations of the Iranian thinkers with Bourgeoisie of the Western Civilization*, p. 56; Gustav Le Bon, *The Civilization of the Arabs*, PP. 336-7.

³⁵ Roger B. Merriam, "The Conquest of Granada", in Lewis, *The Islamic World*, p. 142. Also, see Ha'eri, *The Early Confrontations of the Iranian thinkers with Bourgeoisie of the Western Civilization*, p. 56.

discover and colonize different parts of the world. Thereafter, the British, the French, the Dutch and Germans endeavored to colonize various countries. With the revival of Christian nations, new discoveries and inventions after the renaissance, and the industrial revolution and scientific development in Europe, the new western civilization was founded, drawing on Muslims' legacy.

Bibliography

Thomas Arnold. *The History of the Spread of Islam*. Translated by Abul-Fadl Ezzati. Tehran: Tehran University Publications, 1358 S.A.H. (Solar Islamic Calendar)

Albert Mallet & Jules Isaac. *The History of the Middle Ages*. Translated by Abdul-Hussain Hazhir. Tehran: Elmi Publications & the World of Books, 1362 S.A.H.

Amir-Ali. *The History of Arabs and Islam*. Translated by Muhammad Taqi Fahkr Da'i Gilani. 2nd ed. Tehran: Ganjineh Publications, 1401 A.H.

Baladhuri, Umar ibn Yahya. *Fotuh-al-Buldan* (the section related to Iran). Translated by Adar-Tash Adar-Noosh. 2nd ed. Tehran: Soroush Publications, 1364 S.A.H.

Zeidan, George. *The History of Islamic Civilization*. Translated by Ali Jawahir-Kalam. 6th ed. Tehran: Amir Kabir Publications, 1369 S.A.H.

Ja'fari, Ya'qub. *Muslims in History*. Tehran: The Office of Dissemination of the Islamic Culture, 1371 S.A.H.

A Group of Writers, *Islamic Heritage*. Under Thomas Arnold & Alfred Gume. Translated by Mustafa Alam. Tehran : Mehr Bookstore, 1325 S.A.H.

Ha'eri, Abdul-Hadi. *The Early Confrontations of the Iranian thinkers with Bourgeoisie of the Western Civilization*. Tehran: Amir Kabir Publications. 1367 S.A.H.

Hatta, Philip Khalil. *The History of the Arabs*. Translated by Abul-Qasim Payandeh. 2nd ed. Tehran: Agah Publications, 1366 S.A.H.

Hakimi, Muhammd Reza. *Muslims' Knowledge*. Tehran: The Office of Dissemination of the Islamic Culture. The date of Introduction, 1356 S.A.H.

Durant, Will. *The History of Civilization (The era of Faith)*. Translated by Abul-Qasim Payandeh. 4th ed. Tehran: Iqbal Publications + Franklin, 1343 S.A.H.

Russo, Pier. *The History of Sciences*. Translated by Hassan Saffari. Tehran, 1358 S.A.H.

Salmasi-zadeh, Jawad. *The History of the Qur'anic Translation in the World*. Tehran: Amir Kabir Publications, 1369 S.A.H.

Shakib-Arsalan, *The History of Islamic Conquests in Europe*. Translated by Ali Dawani. 5th ed. Tehran: The Office of Dissemination of the Islamic Culture, 1370 S.A.H.

Shibli, Ahmad. *The History of Education in Islam*. Translated by Muhammad Hussain Sakit. Tehran: The Office of Dissemination of the Islamic Culture, 1361 S.A.H.

Shahidi, *The Analytical History of Islam*. Tehran: The Center of Academic Publication, 1369 S.A.H.

Safa, Dabih-u-llah. *The History of the Rational Sciences in the Islamic Civilization*. Tehran: Tehran University Publications, 1374 S.A.H.

Tabari, Muhammad ibn Jarir. *Tabari History (Tarikh-u-Rusul wa al-Umam wa al-Muluk)*. Translated by Muhmmad Hussain Payandeh. 3rd ed. Asatir Publications, 1363 S.A.H.

Ghunaimah, Abdu-Rahim. *The History of the Great Islamic Universities*. Translated by Nur-u-llah Kasa'i. Tehran: Tehran University Publications, 1372 S.A.H.

Fayyaz, Ali Akbar. *The History of Islam*. Tehran: Tehran University Publications, 1369 S.A.H.

Qurbani, Zain-ul-Abidin. *The Reasons of Spread of Islam and Muslims' Fall*. Tehran: The Center of Academic Publication, 1371 S.A.H.

_____. *The History of Islamic Culture and Civilization*. Tehran: The Office of Dissemination of the Islamic Culture. The date of Introduction, 1354 S.A.H.

Carra De Vaux, Baron. *Muslim Thinkers*. Translated by Ahmad Aram. Tehran: The Office of Dissemination of the Islamic Culture, 1359 S.A.H.

Gustav Le Bon. *The Civilization of the Arabs*. Translated by Muhammad Taqi Fakhri Da'i Gilani. 4th ed. Tehran: Press Scientific Institute, 1334 S.A.H.

Mie Lee, Aldo. *Islamic Sciences and their Role in the World Scientific Development*. Translated by Muhammad Riza Shja' Radhawi & Asad-ullah Alawi. Mashhad: Publications of Imam A-Ridha's Sacred Sanctuary, 1371 S.A.H.

Nasr, Hussain. *Science and Civilization in Islam*. Translated by Ahmad Aram. 2nd ed. Tehran: Khwarizmi Publications, 1359 S.A.H.

Vaglieri, Laura. *The Call of Islam from the heart of Italy*. Translated by Muhammad Baqir Ansari. Qum: Islamic Message Publications, Bita.

Hunke, Sigrid. *Islamic Culture in Europe*. Translated by Murtadha Rahbani. 3rd ed. Tehran: The Office of Dissemination of the Islamic Culture, 1370 S.A.H.

Ya'qubi, Ahmad ibn Ya'qub. *Ya'qubi History*. Translated by Muhammad Ibrahim Ayati. 3rd ed. Tehran: Scientific-Cultural Publications, 1362 S.A.H.