

## Islamic Human Development of Science and the Better Understanding of the Environment

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April 11, 2012



*A lecture prepared for the Universal Peace Federation's European Leadership Conference in UNESCO Paris, "A New Vision for Peace and Human Development" 12th to 13th April 2012 at UNESCO Headquarters, Place de Fontenoy, Paris.*

Human Development occurs all the time that a person is alive in any nation or culture. Although it is believed that the issues of development are more relevant for those who are considered to be “less developed”. The Muslim world are the second largest in the world covering mainly 1.8 Billion Muslims but torn between forces of traditionalism and modernity. Some Muslim countries are in transition due to rise of Arab spring recently. Islamic culture is very rich as it has made a very valuable contribution in human development in science and better understanding of our world.

Bismillah Hir Rahma Nir Rahim (I begin with name of God the Most Kind the Most Merciful). I greet you with the greetings of Islam (Assalamu Alaykum wa Rahmatullah wa Barakathu (May God’s blessing and peace be with us all.)

Form the very out set, I brought greetings from Farooq Murad the current Secretary General of British Muslim's most representative umbrella body Muslim Council of Britain (MCB) and the previous Secretary Generals Sir Iqbal Sacranie OBE, Yousuf Bhailok and Dr Abdul Bari OBE

I am honoured, and deeply humbled, to the Universal Peace Federation (UPF) for inviting me on this historic occasion to discuss an important issue of Human development. From the very outset I wish to give my personal and, on behalf of the **Muslim Council for Religious and Racial Harmony UK**, congratulations to your organisation for the very valuable work you have done which has been very much recognised by international agencies.

Human Development occurs all the time that a person is alive in any nation or culture. Although it is believed that the issues of development are more relevant for those who are considered to be “less developed”. The Muslim world are the second largest in the world covering mainly 1.8 Billion Muslims but torn between forces of traditionalism and modernity. Some Muslim countries are in transition due to rise of Arab spring recently,. Islamic culture is very rich as it has made very valuable contribution in human development in science and better understanding of our world.

Islam as religion stands for social justice and human development in every walk of life. Real Science From Real (*Muslim*) Scholars. You asked for it, Allah made it easy for us to give it to you... The real facts about true Islam and Muslim scholars contributions to science throughout history. No longer do you have to accept 'western substitutes' for real science and where it came from. Here is the list we have all been waiting for... [Science Islam](#)

### **1. History of Experimental Physics & Optics - Ibn Al Haytham**

The study of experimental physics began with Ibn al-Haytham,[1] a pioneer of modern optics, who introduced the experimental scientific method and used it to drastically transform the understanding of light and vision in his Book of Optics, which has been ranked alongside Isaac Newton's Philosophiæ Naturalis Principia Mathematica as one of the most influential books in the history of physics,[2] for initiating a scientific revolution in optics[3] and visual perception.[4]

### **2. Experimental Scientific Method - Biruni (precursors to Newton's Law of Motion)**

The experimental scientific method was soon introduced into mechanics by Biruni,[5] and early precursors to Newton's laws of motion were discovered by several Muslim scientists.

### **3. Law of Inertia & Concept of Momentum - Ibn Al Haytham & Avicenna**

The law of inertia, known as Newton's first law of motion, and the concept of momentum were discovered by Ibn al-Haytham (Alhacen)[6] and Avicenna.[7][8]

### **4. Fundamental Law of Classical Mechanics (before Newton's 2nd Law of Motion) - Hibat Allah Abu'l Barakat al-Baghdaadi**

The proportionality between force and acceleration, considered "the fundamental law of classical mechanics" and foreshadowing Newton's second law of motion, was discovered by Hibat Allah Abu'l-Barakat al-Baghdaadi,[9]

### **5. Concept of Reaction - Ibn Bajjah (Avempace)**

The concept of reaction, foreshadowing Newton's third law of motion, was discovered by Ibn Bajjah (Avempace).[10]

### **6. Universal Gravitation (before Newton's Law) - Jafar Muhammad ibn Musa Ibn Shakir, Ibn Al Haytam, Al Khazini**

Theories foreshadowing Newton's law of universal gravitation were developed by Ja'far Muhammad ibn Mūsā ibn Shākir,[11] Ibn al-Haytham,[12] and al-Khazini.[13]

### **7. Acceleration & Concept of Impetus (before Galileo, enriching Aristotle's Physics)- Avicenna & Ibn Bajjah**

Galileo Galilei's mathematical treatment of acceleration and his concept of impetus[14] was enriched by the commentaries of Avicenna[15] and Ibn Bajjah to Aristotle's Physics as well as the Neoplatonic tradition of Alexandria, represented by John Philoponus.[16]

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We don't need to be shy or silent any longer about the many contributions to science, medicine, economics and general progress for all humanity made by Muslim scholars throughout history. Let's all work together to share this important, historical information with others before it becomes pushed aside and forgotten.

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## Appendix

### **Chronology of Early Scholars of Islam (Caliphs from Sahabah, Isna-'Ashari (12)Imams, Fiqh Imams, Sihah-Sitta Imams, & others)**

The chronology presented here gives an understanding of the time difference and generation gaps of famous names in early Islamic history, e.g., Imam Abu-Hanifah was early enough to have seen Sahabah, while Imam Malik, Imam Shafi'i, and Imam Ahmad bin-Hambal had not met or seen any Sahabah.

Compare the time frame of Imam Bokhari & Imam Muslim with those of Imam Malik or Imam Abu-Hanifah. See the times of 12 Imams of Isna-'ashari faith (The Twelvers).

NAME	BORN	DIED	REMARKS
Hadrat Abu-Bakar Siddiq	51 BH*/573 CE*, Makkah	13 AH*/634, Medinah	First Caliph (Khalifah) of Prophet Muhammad (pbuh), Khalifatur-Rasool
Hadrat Umar ibn al-Khattab	41 BH/582 Makkah	24 AH/645 Medinah	Second Caliph (Khalifah), Title "Ameerul-Momineen" was first adopted
Hadrat Uthman ibn Affaan	47 BH/577 Makkah	35 AH/655 Medinah	Ameerul-Momineen, Third Caliph (Khalifah)
Hadrat Ali ibn Abi-Taalib (1)	13 Rajab 23BH/600 Makkah	21 Ramadhan 40AH/661 Kufah	Ameerul-Momineen, Fourth Caliph (Khalifah)
Imam Hasan ibn Ali (2)	15 Ramadan 3 AH/Feb 28, 625 (Thursday) Medinah	Safar 49 or 50 AH/669 or 670 Medinah	Ameerul-Momineen (5th Khalifah), First son of Ali & Fatimah, Grand Child of Prophet Muhammad (pbuh), was probably poisoned
Hadrat Mo'awiah ibn Abi-Sufian	12 BH/611 Makkah	60 AH/680 Dimashq	6th Khalifah (Brother-in-law of Prophet Muhammad (pbuh))
Imam Husain ibn Ali (3)	3 Sha'ban 4 AH/Jan 8, 626 (Wednesday) Medinah	10 Muharram 61 AH/Oct 9, 680 (Tuesday) Karbala, Iraq	Shaheed-e-Karbala, Second son of Ali & Fatimah, Grand Child of Prophet Muhammad (pbuh)
Imam Ali Zainul-Abideen (4)	5 Sha'ban 38 AH/Jan 5, 659 (Saturday) Medinah	25 Muharram 95 AH/Oct 20, 713 (Friday) Medinah	Son of Imam Husain
Imam Muhammad Baqir (5)	1 Rajab 57 AH/May 9, 677 (Saturday) Medinah	7 Zul-Hijja 114 AH/Jan 28, 733 (Wednesday) Medinah	Son of Imam Ali Zainul-Abideen
Imam Abu-Hanifah, Imam-1	80 AH/699 Kufah, Iraq	150 AH/767 Baghdad	Taabai, Scholar of Fiqh (Jurisprudence), student of Imam Baqir & Imam Ja'far Sadiq
Imam Ja'far Sadiq (6)	17 Rabi-al-Awwal 83 AH/April 10, 702 (Monday) Medinah	25 Shawwal 148 AH/Dec 13, 765 (Friday) Medinah	Taabai, Son of Imam Baqir. He was Imam of Fiqh Ja'fri (Jurisprudence)
Imam Maalik, Imam-2	93 AH/712 Medinah	179 AH/795 Medinah	Taba-Taabai, Compiler of Hadith & Scholar of Fiqh (Jurisprudence), student of Imam Ja'far Sadiq
Imam Abu-Yusuf (Hanafi)	113 AH/731 Kufah, Iraq	187 AH/803 Baghdad	Taba-Taabai, Student of Abu-Hanifah, Scholar of Fiqh (Jurisprudence)

Up to the time of Imam Ja'far Sadiq, friends of Ali (Shi'aan-e-Ali) were not considered any different from other Muslims. Imam Ja'far Sadiq had two sons, Isma'il and Musa al-Kazim. Followers of Isma'il become the "Sevensers" or "Ismailis. Followers of Musa al-Kazim become the "Twelvers" who believed that the

lineage of Imam continued with Imam Musa al-Kazim. Beginning of Shi'ism was not documented before this time, but long after, when the concept of 12 Imams became the basis of Shi'as after the 12th Imam's disappearance in 878 CE.

Imam Musa Kazim (7)	7 Safar 129 AH/Oct 27, 745 (Thurs) al-Abwa, 7 mi from Medinah	25 Rajab 183 AH/Sep 1, 799 (Sunday) Kadhimiya	Son of Imam Ja'far Sadiq, died in prison
Imam Muhammad (Hanafi)	132 AH/750 Wasit, Iraq	189 AH/805 Baghdad	Student of Imam Maalik, and Imam Abu-Yusuf (Jurisprudence)
Imam Shafi'i, Imam-3	150 AH/767 Ghaza	204 AH/819 Egypt	Student of Imam Maalik (Jurisprudence)
Imam Ali Reza (8)	11 Zul-Qa'da 153 AH/Nov 4, 770 (Sunday) Medinah	17 Safar 203 AH/Aug 24, 818 (Tuesday) Mash'had, Iran	Son of Imam Musa Kazim
Imam Ahmad ibn Hambal, Imam-4	164 AH/780 Baghdad	241 AH/855 Baghdad	Student of Imam Shafi'i, Scholar of Fiqh (Jurisprudence)
Imam Muhammad Jawwad Taqi (9)	10 Rajab 195 AH/April 8, 811 (Tuesday) Medinah	30 Zul-Qa'da 220 AH/Nov 26, 835 (Friday) Kadhimiya	Son of Imam Ali Reza
Imam Ali Naqi (10)	5 Rajab 215 AH/Aug 28, 830 (Sunday) Surba, Iraq	3 Rajab 254 AH/June 28, 868 (Monday) Samarra, Iraq	Son of Imam Muhammad Jawwad Taqi
Imam Hasan Askari (11)	8 Rabi-al-Thani 232 AH/Dec 1, 846 (Wednesday) Samarra, Iraq	8 Rabi-al-Awwal 260 AH/Jan 1, 874 (Friday) Samarra, Iraq	Son of Imam Ali Naqi
Imam Muhammad Mehdi (12)	15 Sha'ban 255 AH/July 29, 869 (Friday) Samarra, Iraq	Disappeared at age 9 in 878 CE	Son of Imam Hasan Askari. Followers of Isna-'ashari faith (The Twelvers) believe that he is still alive, hiding, and will re-appear near Judgment Day to establish Kingdom of Allah, to fill the world with equality and justice.
Imam Bokhari	194 AH/810 Bukhara	256 AH/870 Samarqand	Compiler of most authentic Hadith book
Imam Muslim	206 AH/821 Nishapur, Iran	261 AH/875 Nishapur, Iran	Compiler of very authentic Hadith book
Imam Abu-Daood	202 AH/817 Sindh-Kabul	275 AH/889 Basrah, Iraq	Scholar and Compiler of Hadith
Imam Ibn Maja	209 AH/824 Qazween, Iraq	273 AH/887 Qazween, Iraq	Scholar and Compiler of Hadith
Imam Tirmidhi	209 AH/824 Tirmidh, Balkh	279 AH/892 Tirmidh, Balkh	Scholar and Compiler of Hadith

Imam Nasaai	214 AH/829 Khurasan, Iran	303 AH/915 Egypt	Scholar and Compiler of Hadith
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**Notes:** BH = Before Hijra AH = After Hijra CE = Common Era Chronology for Caliphs from Sahabah is basically taken from "Khilafate-e-Islamia" by Abdul-Quddoos Hashmi, Page 29. Isna-Ash'ari Imams chronology is basically taken from "Millat-e-Islamia ki Mukhtasar Tareekh" by Sarwat Saulat, Page 157.

Chronology for Fiqh Imams is taken from "Tazkira Imam Abu-Hanifah" by Jamil Ahmad Sharqपुरi, various pages.

## **Muslim Scientists: Rise And Fall Of Muslim Scientists**

In the name of Allah, The Most Gracious, The Most Merciful.

The rise of the Muslims to the zenith of civilization in a period of four centuries was based on Al-Islam's emphasis on learning. This is obvious when one takes a look at the Qur'an and the traditions of Prophet Muhammad (peace be upon him) which are filled with references to learning, education, observation, and the use of reason. The very first verse of the Qur'an revealed to the Prophet on the night of power (Laylathul Qadr) in the month of Ramadhan in 611 CE reads: "Read: In the name of thy Lord who created man from a clot. Read: And thy Lord is the Most Generous Who taught by the pen, Taught man that which he knew not." (Translation of Qur'an 96:1-5) "And they shall say had we but listened or used reason, we would not be among the inmates of the burning fire." (Translation of Quran 67:10) "Are those who have knowledge and those who have no knowledge alike? Only the men of understanding are mindful." (Translation of Quran 39:9) The Quran exhorts the Muslims to scientific research: "And whoso bringeth the truth and believeth therein such are the dutiful." (Translation of Qur'an 39:33) Every Muslim man's and every Muslim woman's prayer should be: "My Lord! Enrich me with knowledge." (Translation of Qur'an 20:114) The pursuit of knowledge and the use of reason based on sense of observation is made obligatory on every Muslim man and woman. The following traditions of the Prophet (peace be upon him) supplement the foregoing teachings of the Qur'an in the following way:

Seek knowledge "even though it be in China". "The acquisition of knowledge is compulsory for every Muslim, whether male or female." "The ink of the scholar is more sacred than the blood of the martyr." "Seek knowledge from the cradle to the grave." "God has revealed to me, Whoever walks in the pursuit of knowledge I facilitate for him the way to heaven". "The best form of worship is the pursuit of knowledge." "Scholars should endeavour to spread knowledge and provide education for people who have been deprived of it. For, where knowledge is hidden, it disappears." Someone asked the Prophet (peace be upon him) : "Who is the biggest scholar?" He replied: "He who is constantly trying to learn from others, for a scholar is ever hungry for more knowledge." "Seek for knowledge and wisdom, for whatever the vessel from which it flows, you will never be the loser." "Thinking deep for one hour (with sincerity) is better than 70 years of (mechanical) worship." "Worship without knowledge has no goodness in it and knowledge without understanding has no goodness in it." And the recitation of the Qur'an, which is not thoughtful has no goodness in it. "To listen to the words of the learned and to instill unto others the lessons of science is better than religious exercises." "Acquire knowledge: it enables its possessor to distinguish right from the wrong, it lights the way to heaven; it is our friend in the desert, our society in solitude, our companion when friendless; it guides us to happiness; it sustains us in misery; it is an ornament among friends and an armour against enemies." Prophet Muhammad (peace be upon him) was able to unite the Arab tribes who had been torn by revenge, rivalry, and internal fights, and produced a strong nation, that acquired and ruled simultaneously the two known empires at that time, namely the Persian and Byzantine Empires. The Islamic Empire extended from the Atlantic Ocean on the West to the borders of China on the East. Only 80 years after the death of their Prophet the Muslims crossed to

Europe to rule Spain for more than 700 years. The Muslims preserved the cultures of the conquered lands.

The Islamic Empire for more than 1,000 years remained the most advanced and civilized nation in the world. This is because Al-Islam stressed the importance and respect of learning, forbade destruction, developed in Muslims the respect for authority, discipline, and tolerance for other religions. The Muslims recognized excellence and hungered intellectually. The teachings of the Qur'an and Sunnah drove many Muslims to their accomplishments in sciences and medicine. By the 10th century their zeal and enthusiasm for learning resulted in all essential Greek medical and scientific writings being translated into Arabic in Damascus, Cairo, and Baghdad. Arabic became the international language of learning and diplomacy. The centre of scientific knowledge and activity shifted eastward, and Baghdad emerged as the capital of the scientific world. The Muslims became scientific innovators with originality and productivity. The rise of Muslims to the zenith of civilization lasted over a thousand years. During this millennium Muslims contributed vastly to the enhancements of arts, science and cultural growth of mankind. For example Islamic medicine is one of the most famous and best known facets of Islamic civilization, and in which the Muslims most excelled. The Muslims were great torch-bearers of international scientific research. Some of the best and most eloquent praises of science ever written came from the pens of Muslim scientists who considered their work to be acts of worship. The same motives led to the establishment of Al-Azhar (800 C.E), the first university in the world. They hit the "source ball of knowledge" over the fence to Europe. In the words of Campbell, "The European medical system is Arabian not only in origin but also in its structure. The Arabs are the intellectual forbearers of the Europeans." In fact the Muslims are directly responsible for the European Renaissance. At the apex of its glory around the 10th century Cordoba, the Capital of Muslim Spain, had pavements, street lighting, three hundred public baths, parks, palaces, one hundred thousand houses and seventy libraries. There were close to half a million books in a single library whereas the whole of France contained much less than this figure. The Muslim physicians performed complicated eye surgery 600 years earlier than in Europe. The Muslim scientists used paper 200 years before Europe, they had paper mills, banks, police stations and invented spherical trigonometry (indispensable for space sciences) in the late 10th century, solved equations of the third and fourth degree, binomials to the nth degree, and developed differential and integral mathematics. They discovered the force of gravitation, blood circulation, laws of motion, and even developed the theory of evolution and taught it in their universities. They measured the circumferences of the earth and value for specific gravities correct to three decimal places almost a thousand years ago. There is hardly a field of knowledge where Muslims did not research, think, or investigate and explore or invent something exemplary. The status of the Muslim Ummah is of great concern to all the Muslim intellectuals. No one can deny that the Muslim Ummah occupies a position which is at the lowest rung of the ladder in the world. The share of the Muslims in Nobel Prizes and the Olympic Games is close to nothing. Muslims contributions to literature both general and scientific is marginal at the best. It is very sad to see the status of Muslims in the present world at the bottom. Muslims have been economically exploited and politically subjugated. Economically, Muslims are poor; in education they are backward; and in science and technology they are marginal. Even very small countries export arms, medicine and technology to the Muslim countries. The average literacy rate is around 38 per cent and in rural areas in Muslim countries, the illiteracy rate among Muslim women is 93 to 97 per cent. This is contradictory to the message of the Quran and Prophet Muhammad (peace be upon him) as mentioned earlier. The Muslims educated in the western world know about Western books and scholars but they know very little about Muslims books and the intellectual achievements of the Muslims. The mean rate for literacy for the Muslims is 35 per cent lower than that for the Third World, and 40 per cent below the worlds average. The data suggests that almost two-thirds of the Muslims worldwide are illiterate. This low level of literacy, evidently, is responsible for the grinding poverty, the backwardness, and the deplorable conditions under which the vast majority of the Muslims live at present. Pakistan is the most advanced Muslim country in science and technology among Muslim nations. However, the literacy rate for Pakistan, home to the second largest Muslim Ummah in the world, ranks the lowest among the most populous nations, is even below the average for the Muslim nations. What is shocking is India the

second most populous nation in the world, has a significantly higher rate of literacy than Pakistan and Bangladesh. At one time the three countries constituted a single country (British India) with a literacy rate of 12 per cent on the eve of the partition in 1947.

Below is a partial list of some of the reknowned Muslim scientists:

<ul style="list-style-type: none"> <li>• <b>Jalal al-Din Rumi (1207 C.E.)</b></li> <li>• <b>Al-Idrisi (1099 C.E.)</b></li> <li>• <b>Abul Wafa Muhammad al-Buzjani (940 C.E.)</b></li> <li>• <b>Mohammad BinMusa alKhawarizmi (840 C.E.)</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Ibn Battuta - The Great Traveller</b></li> <li>• <b>Jabir Ibn Haiyan (803 C.E.)</b></li> <li>• <b>Omar al-Khayyam (1044 C.E.)</b></li> <li>• <b>Yaqub Ibn Ishaq al-Kindi (800 C.E.)</b></li> </ul>		
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**Muslim Scientists and Thinkers (700 - 1400 C.E.)**

<b>Name</b>	<b>Years (C.E.)</b>	<b>Description</b>
<b>Jabir Ibn Haiyan (Geber)</b>	Died 803	Chemistry (Father of Chemistry)
<b>Musa al-Khawarizmi (Algorizm)</b>	770 - 840	Mathematics, Astronomy, Geography (Algorithm, Algebra, Calculus)
<b>Yaqub Ibn Ishaq al-Kindi (Alkindus)</b>	800 - 873	Philosophy, Physics, Optics, Medicine, Mathematics, Metallurgy
<b>Thabit Ibn Qurra (Thebit)</b>	836 - 901	Astronomy, Mechanics, Geometry, Anatomy
<b>Ali Ibn Rabban al-Tabari</b>	838 - 870	Medicine, Mathematics, Calligraphy, Literature
<b>Al-Farghani (Al-Fraganus)</b>	860	Astronomy, Civil Engineering
<b>Zakariya al-Razi (Rhazes)</b>	864 - 930	Medicine, Ophthalmology, Smallpox, Chemistry, Astronomy
<b>Abu Abdullah al-Battani (Albategnius)</b>	868 - 929	Astronomy, Mathematics, Trigonometry
<b>Abu al-Nasr al-Farabi (Al-Pharabius)</b>	870 - 950	Sociology, Logic, Philosophy, Political Science, Music
<b>Abul Hasan Ali al-Masu'di</b>	Died 957	Geography, History
<b>Abu al-Qasim al-Zahrawi (Albucasis)</b>	936 - 1013	Surgery, Medicine (Father of Modern Surgery)
<b>Muhammad al-Buzjani</b>	940 - 997	Mathematics, Astronomy, Geometry, Trigonometry
<b>Hasan Ibn al-Haitham (Alhazen)</b>	965 - 1040	Physics, Optics, Mathematics
<b>Abu al-Hasan al-Mawardi (Alboacen)</b>	972 - 1058	Political Science, Sociology, Jurisprudence, Ethics
<b>Abu Raihan al-Biruni</b>	973 - 1048	Astronomy, Mathematics (Determined Earth's Circumference)
<b>Ibn Sina (Avicenna)</b>	980 - 1037	Medicine, Philosophy, Mathematics, Astronomy
<b>Omar al-Khayyam</b>	1044 - 1123	Mathematics, Poetry
<b>Abu Hamid al-Ghazali (Algazel)</b>	1058 - 1128	Sociology, Theology, Philosophy
<b>Al-Idrisi (Dreses)</b>	1099 - 1166	Geography (World Map, First Globe)
<b>Ibn Rushd (Averroes)</b>	1128 - 1198	Philosophy, Law, Medicine, Astronomy, Theology
<b>Ibn al-Baitar</b>	Died 1248	Pharmacy, Botany
<b>Jalal al-Din Rumi</b>	1207 - 1273	Sociology

<b>Ibn al-Nafis</b>	1213 - 1288	Anatomy
<b>Ibn Khaldun</b>	1332 - 1395	Sociology, Philosophy of History, Political Science

This is a partial list of some of the leading Muslims. Major Muslim contributions continued beyond the fifteenth century. Contributions of more than one hundred other major Muslim personalities can be found in several famous [publications](#) by Western historians. [Biographies are available in the Islamic Civilization E-book](#) see at

[www.cyberistan.org/islamic/ebook.htm](http://www.cyberistan.org/islamic/ebook.htm)

<b>Jabir Ibn Haiyan (Geber)</b>	<b>Chemistry (Father of Chemistry)</b>	<b>Died 803 C.E.</b>
<b>Al-Asmai</b>	<b>Zoology, Botany, Animal Husbandry.</b>	<b>740 - 828</b>
<b>Al-Khwarizmi (Algorizm)</b>	<b>Mathematics, Astronomy, Geography. (Algorithm, Algebra, calculus)</b>	<b>770 - 840</b>
<b>'Amr ibn Bahr Al-Jahiz</b>	<b>Zoology, Arabic Grammar, Rhetoric, Lexicography</b>	<b>776 - 868</b>
<b>Ibn Ishaq Al-Kindi (Alkindus)</b>	<b>Philosophy, Physics, Optics, Medicine, Mathematics, Metallurgy.</b>	<b>800 - 873</b>
<b>Thabit Ibn Qurrah (Thebit)</b>	<b>Astronomy, Mechanics, Geometry, Anatomy.</b>	<b>836 - 901</b>
<b>'Abbas Ibn Firnas</b>	<b>Mechanics of Flight, Planetarium, Artificial Crystals.</b>	<b>Died 888</b>
<b>Ali Ibn Rabban Al-Tabari</b>	<b>Medicine, Mathematics, Calligraphy, Literature.</b>	<b>838 - 870</b>
<b>Al-Battani (Albategnius)</b>	<b>Astronomy, mathematics, Trigonometry.</b>	<b>858 - 929</b>
<b>Al-Farghani (Al-Fraganus)</b>	<b>Astronomy, Civil Engineering.</b>	<b>C. 860</b>
<b>Al-Razi (Rhazes)</b>	<b>Medicine, Ophthalmology, Smallpox, Chemistry, Astronomy.</b>	<b>864 - 930</b>
<b>Al-Farabi (Al-Pharabius)</b>	<b>Sociology, Logic, Philosophy, Political Science, Music.</b>	<b>870 - 950</b>
<b>Abul Hasan Ali Al-Masu'di</b>	<b>Geography, History.</b>	<b>Died 957</b>
<b>Al-Sufi (Azophi)</b>	<b>Astronomy</b>	<b>903 - 986</b>
<b>Abu Al-Qasim Al-Zahravi (Albucasis)</b>	<b>Surgery, Medicine. (Father of Modern Surgery)</b>	<b>936 - 1013</b>
<b>Muhammad Al-Buzjani</b>	<b>Mathematics, Astronomy, Geometry, Trigonometry.</b>	<b>940 - 997</b>
<b>Ibn Al-Haitham (Alhazen)</b>	<b>Physics, Optics, Mathematics.</b>	<b>965 - 1040</b>
<b>Al-Mawardi (Alboacen)</b>	<b>Political Science, Sociology, Jurisprudence, Ethics.</b>	<b>972 - 1058</b>
<b>Abu Raihan Al-Biruni</b>	<b>Astronomy, Mathematics. (Determined Earth's Circumference)</b>	<b>973-1048</b>
<b>Ibn Sina (Avicenna)</b>	<b>Medicine, Philosophy, Mathematics, Astronomy.</b>	<b>981 - 1037</b>
<b>Al-Zarqali (Arzachel)</b>	<b>Astronomy (Invented Astrolabe).</b>	<b>1028 - 1087</b>
<b>Omar Al-Khayyam</b>	<b>Mathematics, Poetry.</b>	<b>1044 - 1123</b>
<b>Al-Ghazali (Algazel)</b>	<b>Sociology, Theology, Philosophy.</b>	<b>1058 - 1111</b>

**Fall of Muslim Toledo (1085), Corsica and Malta (1090), Provence (1050), Sicily (1091) and Jerusalem (1099). Several Crusades. First wave of devastation of Muslim resources, lives, properties, institutions, and infrastructure over a period of one hundred years. Refer to [Muslim History](#). [Translators of Scientific Knowledge in the Middle Ages](#)**

<b>Abu Bakr Muhammad Ibn Yahya (Ibn Bajjah)</b>	<b>Philosophy, Medicine, Mathematics, Astronomy, Poetry, Music.</b>	<b>1106 - 1138</b>
<b>Ibn Zuhr (Avenzoar)</b>	<b>Surgery, Medicine.</b>	<b>1091 - 1161</b>
<b>Al-Idrisi (Dreses)</b>	<b>Geography (World Map, First Globe).</b>	<b>1099 - 1166</b>
<b>Ibn Tufayl, Abdubacer</b>	<b>Philosophy, Medicine, Poetry.</b>	<b>1110 - 1185</b>
<b>Ibn Rushd (Averroes)</b>	<b>Philosophy, Law, Medicine, Astronomy, Theology.</b>	<b>1128 - 1198</b>
<b>Al-Bitruji (Alpetragius)</b>	<b>Astronomy</b>	<b>Died 1204</b>

Second wave of devastation of Muslim resources, lives, properties, institutions, and infrastructure over a period of one hundred and twelve years. Crusader invasions (1217-1291) and Mongol invasions (1219-1329). Crusaders active throughout the Mediterranean from Jerusalem and west to Muslim Spain. Fall of Muslim Cordoba (1236), Valencia (1238) and Seville (1248). Mongols devastation from the eastern most Muslim frontier, Central and Western Asia, India, Persia to Arab heartland. Fall of Baghdad (1258) and the end of Abbasid Caliphate. Two million Muslims massacred in Baghdad. Major scientific institutions, laboratories, and infrastructure destroyed in leading Muslim centers of civilization. Refer to "A Chronology of Muslim History Parts [III](#), [IV](#)."

<b>Ibn Al-Baitar</b>	<b>Pharmacy, Botany</b>	<b>Died 1248</b>
<b>Nasir Al-Din Al-Tusi</b>	<b>Astronomy, Non-Euclidean Geometry.</b>	<b>1201 - 1274</b>
<b>Jalal Al-Din Rumi</b>	<b>Sociology</b>	<b>1207 - 1273</b>
<b>Ibn Al-Nafis Damishqui</b>	<b>Anatomy</b>	<b>1213 - 1288</b>
<b>Al-Fida (Abdulfeda)</b>	<b>Astronomy, Geography, History.</b>	<b>1273 - 1331</b>
<b>Muhammad Ibn Abdullah (Ibn Battuta)</b>	<b>World Traveler. 75,000 mile voyage from Morocco to China and back.</b>	<b>1304 - 1369</b>
<b>Ibn Khaldun</b>	<b>Sociology, Philosophy of History, Political Science.</b>	<b>1332 - 1395</b>
<b>Ulugh Beg</b>	<b>Astronomy</b>	<b>1393 - 1449</b>

Third wave of devastation of Muslim resources, lives, properties, institutions, and infrastructure. End of Muslim rule in Spain (1492). More than one million volumes of Muslim works on science, arts, philosophy and culture was burnt in the public square of Vivarrambla in Granada. Colonization began in Africa, Asia, and the Americas. Refer to "A Chronology of Muslim History Parts [IV](#), [V](#) (e.g., 1455, 1494, 1500, 1510, 1524, and 1538)"

Two hundred years before a comparable development elsewhere, Turkish scientist Hazarfen Ahmet Celebi took off from Galata tower and flew over the Bosphorus. Logari Hasan Celebi, another member of the Celebi family, sent the first manned rocket, using 150 okka (about 300 pounds) of gunpowder as the firing fuel.

Tipu, Sultan of Mysore [1783-1799] in the south of India, was the innovator of the world's first war rocket. Two of his rockets, captured by the British at Srirangapatana, are displayed in the Woolwich Museum Artillery in London. The rocket motor casing was made of steel with multiple nozzles. The rocket, 50mm in diameter and 250mm long, had a range performance of 900 meters to 1.5 km.

The dates in the table are converted from the Islamic calendar (A.H.) which begins with Hejira, the migration of Prophet Muhammad (s) from Makkah to Medinah. The calendar is based on lunar monthly cycles. 1 A.H. = 622 C.E.

## **One of history's greatest crimes is the almost complete omission of the debt the West owes to Islam and the Muslims and not recognising Islamic scholarship for 1000 year's history**

The history books that fill our bookshelves are indispensable recollections of past civilizations' glories and failures, achievements and abominations. Unfortunately, history can never be completely objective, since it is written by men, and men have a tendency to restrict their thoughts to a single point of view. While history has created in our minds many heroes from murderers, and criminals from saints, one of its greatest crimes is the almost complete omission of the debt the West owes to Islam and the Muslims. W. Montgomery Watt describes the problem:

Because Europe was reacting against Islam it belittled the influence of Saracens and exaggerated its dependence on its Greek and Roman heritage. So today an important task for us is to correct this false emphasis and to acknowledge fully our debt to the Arab and Islamic world. (Ghazanfar, Islamic World and the Western Renaissance)

Students in Western Universities might have heard that Muslims were once leaders in science, but their accomplishments are often belittled, and their scientists are reduced to but borrowers who translated Greek and Persian works then assumedly hid them on a bookshelf so the West can later expand and build on them once it awakes from its sleep during the dark age. Donald Cardwell, in the Fontana History of Technology, claims that technologies imported into Europe during the Dark Ages "originated in China and India and were merely passed on by the Arabs." While cultural bigotry plays a major role in this distortion of the facts, the achievements of the Muslims have been left out of Western historical records as a result of the hatred of Islam embedded in the Judeo-Christian world, which shall be traced to many factors.

Before thoughtlessly calling out "conspiracy" as many Muslims today so often do, one must show that the Muslims actually did have an integral role in scientific development. Due to the wealth of achievements, however, this is not very hard to find.

The book of Allah and the example of the Prophet Muhammad (peace and blessings upon him) set the basis for an intellectual tradition in the Islamic world which relied on reason and honesty. The purpose of knowing the natural world in Islam is to reveal the signs that Allah set in his creation. "We shall show them Our portents on the horizon and within themselves until it will be manifest unto them that it is the Truth" (The Holy Quran, 41:53). While Greek philosophy was based on the relativity of truth and change, in Islam, as Seyyed Hossein Nasr comments:

The arts and sciences came to possess instead a stability and a 'crystallization' based on the immutability of the principles from which they had issued forth; it is this stability that is too often mistaken in the West today for stagnation and sterility. ([www.fordham.edu/halsall/med/nasr.html](http://www.fordham.edu/halsall/med/nasr.html))

The Muslims made numerous advances in many fields, one the most important being physics. They received the physics texts of the Greeks, then translated, corrected, and expanded on them greatly. The basis of the study of optics can be attributed directly to the Muslims. Al-Hassen bin Al-Haythem is considered the founder of this field. He and Al-Beirouni also logically came to the conclusion, in disagreement with Aristotle, that the speed of light is constant and that light is composed of extremely small particles moving at extremely high speeds, which is the basis of the quantum nature of light, an endlessly celebrated tribute to 20<sup>th</sup> century science (Mahmoud 112-113; Davies 29).

Muslim scholars also laid the foundations of mathematics. Muslims were the first to recognize the importance of and use the zero effectively, borrowed from the Indians, bringing to Europe what is now

called “Arabic numerals”. Otherwise, the scientists and mathematicians of Europe would probably still be counting on their fingers or fumbling with clumsy roman numerals when analyzing data. Muhammad bin Mousa Al-Khawarizmi is considered the founder of modern algebra, and the mathematicians that followed made ever more impressive contributions. Ghiath Edden Al-Kashi, approximated pi to 16 places past the decimal point. The system know as Pascal’s triangle, which assists in factoring equations in the form of  $(a + b)^n$ , was developed by Al-Karkhi, and not Louis Pascal. Later Muslim mathematicians were able to factor equations as complex as fourth degree equations; fifth degree equations are impossible to factor. (Mahmoud 137-147) The contribution of Muslim mathematicians to algebra is integral to the development of all sciences as mathematics is frequently referred to as the language of science. Newton would have had quite a difficult time quantitatively describing his laws of motion without using the algebra first implemented by the Muslims.

The Muslims made monumental strides in the practice and study of medicine. Ibn Sina’s text the Canon of Medicine, was used as a text in Europe for centuries later, and its popularity dwarfed the books of Galen and Hippocrates. Physicians like Abul Qasim al-Zahrawi, Ibn Sina, and Ali Abbas, wrote texts on surgery that would form the foundations of Western Surgery (Shustery 152-153). A story by the Muslim physician Usamah bin al-Manqaz serves as a good example of the superiority of Muslims doctors over their European contemporaries:

Among the marvels of the medical affairs on incident is this that Sahib Munitrah wrote to his uncle that there was need of a doctor to treat his companions. My uncle sent a Christian doctor, Thabit, to them, but he came back within ten days. We asked him, “Have you been able to treat the patients in such a short period?” He said, “They had brought to me a soldier who had a boil on one of his feet. When a bandage dipped in the juice of Linjah (a plant) was applied, the abscess got burst. There was another patient, a woman whose dry and chapped skin had developed itch and was giving her trouble. I kept her on a restricted diet as a preventive and tried to make her dry skin moist. But suddenly an English doctor appeared on the scene and told the people there about me, “What does he know of medical science and treatment of patients?” Then he asked the soldier with the abscess on his foot whether he would like to live with one leg or die with both. The soldier said he would prefer to live with one leg only. So the soldier and a sharp axe were brought and I was witness to this scene. The English doctor straightened his leg on a wooden board and asked the soldier (executioner, Tr.) to chop off his leg with a single stroke of his axe. He made a stroke with the axe, and I was a witness to that, and found that it failed to sever the leg. So he made a second attempt. The bone marrow was thrown out and the patient died immediately.

The author then reveals how the English doctor poured water on the woman with dry skin, and she too died a sudden, painful death. ([www.erols.com/gmqm/sibai10.htm](http://www.erols.com/gmqm/sibai10.htm))

While historians have written many books on the high level of sophistication and learning of the Muslims compared to the Europeans during the dark ages, few have thought to make the connection between Muslim science and the scientific explosion that was to occur later in Europe. The dependence of the latter on the former, however, is immense. It would not be controversial to say that the scientific revolution that took place in 17<sup>th</sup> Europe could not have occurred without the help of the Muslims.

The maelstrom brought upon Europe by the intellectual tradition taken from the Muslim world had far-reaching consequences on European life. Slowly as education spread throughout Europe, with Universities arising in the major cities, the authority of science grew exponentially. Even the powerful Church of Rome would soon go down as it foolishly tried to challenge rationality and scientific proofs with superstitions and the fading doctrine of papal authority. The West would take this tradition and run amok with it, venturing in directions never before taken by humanity. Soon Europe, which was during

Islam's golden age dismissed by Ibn Khaldun as "those parts", had superseded the Muslim World in every way imaginable: scientifically, militarily, economically, and administratively. (Eaton 32-33)

However, a perplexing relationship existed between the Muslim world and Europe. It was not one of mutual reverence and respect, nor was it one of a father-culture, daughter-culture nature. There was an overpowering sentiment of hate embedded in European culture that outweighed any benefit or advancement the Muslims would give to them.

For hundreds of years the Muslims would take a permanent place in the forefront of the European mind. Wave after wave of Muslim armies crashed into Europe, coming with superior military training, unseen technology, and a culture alien to all what the European knew. Gai Eaton explains:

The "menace of Islam" had remained the one constant factor amidst change and transformation and it had been branded on the European consciousness. The mark of that branding is still visible... "The fact remains", says the Tunisian writer Hichem Djait, "that medieval prejudices insinuated themselves into the collective unconsciousness of the West at so profound a level that one may ask, in terror, whether they can ever be extirpated from it." (30-31)

This fear would turn into hate and aggression as Europe regained its strength. The Muslims also would serve as a means for Europe to do so. These "pagans" as Europeans saw them, would be the perfect enemy for Europeans to rally together. They did so, quite pathetically, in the crusades. The crusades, in terms of human losses, were one of the most lopsided military campaigns in history, with the exception of the savage massacres of Muslim civilians by the Christian armies. However, the crusades, initially being a crushing defeat for the Christians, would introduce them to the enormity of the gap between them and the Muslims.

At the same time, European scholars were learning at the hands of the Muslims in Spain. The translated Greek works would introduce the Europeans to an indigenous intellectual tradition they never knew existed. This helped spark a new self-confidence among the scholars of Europe. Unfortunately, the scholars of Europe were torn between their intellectual loyalty and the strong hatred of their teachers present in their culture. Karen Armstrong explains:

The Arabs in particular were a light to the Christian West and yet this debt has rarely been fully acknowledged. As soon as the great translation work had been completed, scholars in Europe began to shrug off this complicating and schizophrenic relationship with Islam and became very vague indeed about who the Arabs really were... There is an unhealthy repression and doublethink about people who are at one and the same time guides, heroes, and deadly enemies. This is very clear in the scholarship about Islam. (64-65, 225-226)

This hatred, however, was, for the most part of Islamic history, one-sided. The Muslims had little reason to hate, or even to be concerned about Europe. To them it was a land of barbarism and backwardness, of a foreign landscape and weather. The battle of Poitiers, for example, is considered by the Europeans as one of the major turning points in history, where the French armies repelled a Muslim raid into southern France. However, rarely is the battle mentioned by Muslim historians, and when mentioned it has been described as but a trivial raid. (Armstrong 42)

Another factor that plays alongside the long-standing hatred of Islam in Europe is the phenomenon known as orientalism. This concept was first articulated by Edward Said in his landmark book *Orientalism*, which is now considered required reading for anyone studying Middle Eastern culture or history. Orientalism is the result of the elaboration of the imaginary distinction between East and West:

geographically, culturally, morally, and intellectually. The result of orientalism are claims that go along the lines of “ ‘We’ are like this, but ‘they’, for unexplainable reasons, are fundamentally different, and in due course, inferior.” This in turn serves as justification for “Us” to rule “Them”, to exploit “Them”, to guide “Them” to our enlightened ways. Academic orientalism gave rise to arrogant, seemingly humanistic ideals which drove imperialism, whose effects are felt very painfully in the Muslim, as well as most of the third, world. As Said explains it:

It [orientalism] is... a distribution of geopolitical awareness into aesthetic, scholarly, economic, sociological, historical, and philological texts; it is an elaboration not only of a basic geographical distinction (the world is made up of two unequal halves, Orient and Occident) but also of a whole series of “interests” which, by such means as scholarly discovery, philological reconstruction, psychological analysis, landscape and sociological description, it not only creates but also maintains; it is rather than expresses, a certain will or intention to understand, in some cases to control, manipulate, even to incorporate, what is a manifestly different (or alternative and novel) world; it is, above all, a discourse that is by no means in direct, corresponding relationship with political power in the raw, but rather is produced and exists in an uneven exchange with various kinds of power, shaped to a degree by the exchange with power political (as with a colonial or imperial establishment), power intellectual (as with reigning sciences like comparative linguistics or anatomy, or any of the modern policy sciences), power cultural ( as with orthodoxies and canons of taste, texts, values), power moral (as with ideas about what “we” do and what “they” cannot do or understand as “we” do). Indeed, my real argument is that Orientalism is—and does not simply represent—a considerable dimension of modern political-intellectual culture, and as such has less to do with the Orient than it does with “our” [Western] world. (12) **Italics in original text]**

One may ask after looking at the reasons why Muslim scholars are vastly undervalued in Western books is “Why should we care now?” The scholars are dead. The ink in the history books has dried. What good will it bring Muslims, besides a headache, to raise this issue now? It is done to restore confidence to the Muslim Ummah, to remind believers what is needed to be great again. The Muslims ruled from France to India, not only because of being blessed with the true message, but also of being superior to the conquered people in all other “worldly” ways. The Muslims would have never conquered the Persians without superior military planning and tactics. The people of the Roman Empire in greater Syria and North Africa would have never converted to Islam if the Muslims were not materially superior to the Romans. The Khatib who gives the Friday sermon, who believes that Muslims will become great again once they start using their miswaks more often, is missing the whole story. Islam does not spread through prayer and piety—people go to the Jannah through prayer and piety. Islam provides a system that allows individuals to reach their fullest potentials in this life, and to encourage worship that allows individuals to reach their fullest potentials in the next.

Studying the lives of the Muslim scholars also provides modern-day Muslims with a portrayal of the prototypical modern scientist. He is one who devotes his efforts to discovering Allah’s signs in this world and who tries to direct his or her discoveries those that produce social benefit.

For the Westerner, it is important to change these historical inaccuracies to help improve the relations between the West and the Muslim world by finally acknowledging the enormous debt owed to the Muslims. However, as the celeritous progress of Western science pushes on, it is more likely that the increasing arrogance and faith in Western science with its purely Western (Greek) origins will keep this overdue apology from occurring. While a historian may mention “Avicenna” or “Averroes” fleetingly in one of his or her books, the problem is that what is left out is far greater than what is told. The eminent historian George Sarton criticized those who “will glibly say ‘The Arabs simply translated Greek

writings, they were industrious imitators...’ This is not absolutely untrue, but is such a small part of the truth, that when it is allowed to stand alone, it is worse than a lie.”

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This page was done for my “Scientific Legacy in Islam” (Turath al-‘Ilmi al-Arabi al-Islami) course that I took for the summer at the [University of Jordan](#).

All good is from Allah, all misinformation is from me.

Wassalam

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