Who are the Muslims?

(part 1 of 2)

Muslims come from all races, nationalities and cultures across the globe. They have varied languages, foods, dress, and customs; even the way they practice may differ. Yet they all consider themselves to be Muslim.

Less than 15% of Muslims live in the Arab world; a fifth are found in Sub-Saharan Africa; and the world's largest Muslim community is in Indonesia. Substantial parts of Asia, and almost all Central Asian republics, are Muslims. Significant Muslim minorities are found in China, India, Russia, Europe, North America and South America.

Over a billion people from all races, nationalities and cultures across the globe are Muslims-from the rice farms of Indonesia to the desert heart of Africa; from the skyscrapers of New York to the Bedouin tents in Arabia.

How did the spread of Islam affect the World?

The Muslim community continued to grow after Prophet Muhammad's death. Within a few decades, vast numbers of people across three continents-Africa, Asia and Europe- had chosen Islam as their way of life.

One of the reasons for the rapid and peaceful spread of Islam was the purity of its doctrine-Islam calls for faith in only One God. This, coupled with the Islamic concepts of equality, justice and freedom, resulted in a united and peaceful community. People were free to travel from Spain to China without fear, and without crossing any borders.

Many Muslims scholars traveled to these cities seeking knowledge. They translated into Arabic volumes of philosophical and scientific works from Greek and Syriac languages (the languages of Eastern Christian scholars), from Pahlavi

(the scholarly language of Pre-Islamic Persia), and from Sanskrit (an ancient Indian language). As a result, Arabic became the language of worldly scholarship, and people migrated from all over the world to study in the Muslim Universities.

By 850, most of the philosophical and scientific works of Aristotle; much of Plato and the Pythagorean School; and the major works of Greek astronomy, mathematics and medicine such as the Almagest of Ptolemy, the Elements of Euclid, and the works of Hippocrates and Galen, were all rendered into Arabic. For the next 700 years, Arabic became the most important scientific language of the world and the repository of much of the wisdom and the sciences of antiquity.

The achievement of scholars working in the Islamic tradition went far beyond translation and preservation of ancient learning. These scholars built upon the ancient heritage with their own scientific advances. These advancements were a direct cause of the Renaissance in Europe.

Muslims excelled in art, architecture, astronomy, geography, history, language, literature, medicine, mathematics and physics. Many crucial systems such as algebra, the Arabic numerals, and the very concept of the zero (vital to the advancement of mathematics), were formulated by Muslim scholars and shared with medieval Europe. Muslims invented sophisticated instruments that made future European voyages of discovery possible: the astrolabe, the quadrant, and detailed navigational maps and charts.

Muslims Contribution To Science

Astronomy

Muslims have always had a special interest in astronomy. The moon and the sun are of vital importance in the daily life of every Muslim. By the moon, Muslims determine the beginning and the end of the months in their lunar calendar. By the sun the Muslims calculate the times for prayer and fasting. It is also by means of astronomy that Muslims can determine the precise direction of the Qiblah, to face the Ka'bah in Makkah, during prayer.

The Quran contains many references to astronomy.

> **"The heavens and the earth were ordered rightly, and were made subservient to man, including the sun, the moon, the stars, and day and night. Every heavenly body moves in an orbit assigned to it by God and never digresses, making the universe an orderly cosmos whose life and existence, diminution and expansion, are totally determined by the Creator." (Quran 30:22)**

These references, and the injunctions to learn, inspired the early Muslim scholars to study the heavens. They integrated the earlier works of the Indians, Persians and Greeks into a new synthesis. Ptolemy's Almagest (the title as we know it is Arabic) was translated, studied and criticized. Many new stars were discovered, as we see in their Arabic names - Algol, Deneb, Betelgeuse, Rigel, Aldebaran. Astronomical tables were compiled, among them the Toledan tables, which were used by Copernicus, Tycho Brahe and Kepler. Also compiled were almanacs - another Arabic term. Other terms from Arabic are zenith, nadir, albedo, azimuth.

Muslim astronomers were the first to establish observatories, like the one built at Mugharah and they invented instruments such as the quadrant and astrolabe, which led to advances not only in astronomy but in oceanic navigation, contributing to the European age of exploration.

(part 2 of 2)

Geography

Muslim scholars paid great attention to geography. In fact, the Muslims' great concern for geography originated with their religion. The Quran encourages people to travel throughout the earth to see God's signs and patterns everywhere. Islam also requires each Muslim to have at least enough knowledge of geography to know the direction of the Qiblah (the position of the Ka'bah in Makkah) in order to pray five times a day. Muslims were also used to taking long journeys to conduct trade as well as to make the Hajj and spread their religion. The far-flung Islamic empire enabled scholar-explorers to compile large amounts of geographical and climatic information from the Atlantic to the Pacific.

Among the most famous names in the field of geography, even in the West, are Ibn Khaldun and Ibn Batuta, renowned for their written accounts of their extensive explorations.

In 1166, Al-Idrisi, the well-known Muslim scholar who served the Sicilian court, produced very accurate maps, including a world map with all the continents and their mountains, rivers and famous cities. Al-Muqdishi was the first geographer to produce accurate maps in color.

It was, moreover, with the help of Muslim navigators and their inventions that Magellan was able to traverse the Cape of Good Hope, and Da Gama and Columbus had Muslim navigators on board their ships.

Humanity

Seeking knowledge is obligatory in Islam for every Muslim, man and woman. The main sources of Islam, the Quran and the Sunnah (Prophet Muhammad's traditions), encourage Muslims to seek knowledge and be scholars, since this is the best way for people to know Allah (God), to appreciate His wondrous creations and be thankful for them. Muslims were therefore eager to seek knowledge, both religious and secular, and within a few years of Muhammad's mission, a great civilization sprang up and flourished. The outcome is shown in the spread of Islamic universities; Al-Zaytunah in Tunis, and Al-Azhar in Cairo go back more than 1,000 years and are the oldest existing universities in the world. Indeed, they were the models for the first European universities, such as Bologna, Heidelberg, and the Sorbonne. Even the familiar academic cap and gown originated at Al-Azhar University.

Muslims made great advances in many different fields, such as geography, physics, chemistry, mathematics, medicine, pharmacology, architecture, linguistics and astronomy. Algebra and the Arabic numerals were introduced to the world by Muslim scholars. The astrolabe, the quadrant, and other navigational devices and maps were developed by Muslim scholars and played an important role in world progress, most notably in Europe's age of exploration.

Muslim scholars studied the ancient civilizations from Greece and Rome to China and India. The works of Aristotle, Ptolemy, Euclid and others were translated into Arabic. Muslim scholars and scientists then added their own creative ideas, discoveries and inventions, and finally transmitted this new knowledge to Europe, leading directly to the Renaissance. Many scientific and medical treatises, having been translated into Latin, were standard text and reference books as late as the 17th and 18th centuries.

Mathematics

It is interesting to note that Islam so strongly urges mankind to study and explore the universe. For example, the Holy Quran states:

> **"We (Allah) will show you (mankind) Our signs/patterns in the horizons/universe and in yourselves until you are convinced that the revelation is the truth." (Quran 14:53)**

This invitation to explore and search made Muslims interested in astronomy, mathematics, chemistry, and the other sciences, and they had a very clear and firm understanding of the correspondences among geometry, mathematics, and astronomy.

The Muslims invented the symbol for zero (The word "cipher" comes from Arabic sifr), and they organized the numbers into the decimal system - base

10. Additionally, they invented the symbol to express an unkown quantity, i.e. variables like x.

The first great Muslim mathematician, Al-Khawarizmi, invented the subject of algebra (al-Jabr), which was further developed by others, most notably Umar Khayyam. Al-Khawarizmi's work, in Latin translation, brought the Arabic numerals along with the mathematics to Europe, through Spain. The word "algorithm" is derived from his name.

Muslim mathematicians excelled also in geometry, as can be seen in their graphic arts, and it was the great Al-Biruni (who excelled also in the fields of natural history, even geology and mineralogy) who established trigonometry as a distinct branch of mathematics. Other Muslim mathematicians made significant progress in number theory.

Medicine

In Islam, the human body is a source of appreciation, as it is created by Almighty Allah (God). How it functions, how to keep it clean and safe, how to prevent diseases from attacking it or cure those diseases, have been important issues for Muslims.

Prophet Muhammad, may the mercy and blessings of God be upon him, said:

"God created no illness, but established for it a cure, except for old age. When the antidote is applied, the patient will recover with the permission of God."

This was strong motivation to encourage Muslim scientists to explore, develop, and apply empirical laws. Much attention was given to medicine and public health care. The first hospital was built in Baghdad in 706 AC. The Muslims also used camel caravans as mobile hospitals, which moved from place to place.

Since the religion did not forbid it, Muslim scholars used human cadavers to study anatomy and physiology and to help their students understand how the body functions. This empirical study enabled surgery to develop very quickly.

Al-Razi, known in the West as Rhazes, the famous physician and scientist, (d. 932) was one of the greatest physicians in the world in the Middle Ages. He stressed empirical observation and clinical medicine and was unrivalled as a diagnostician. He also wrote a treatise on hygeine in hospitals. Khalaf Abul-Qasim Al-Zahrawi was a very famous surgeon in the eleventh century, known in Europe for his work, Concessio (Kitab al-Tasrif).

Ibn Sina (d. 1037), better known to the West as Avicenna, was perhaps the greatest physician until the modern era. His famous book, Al-Qanun fi al-Tibb,

remained a standard textbook even in Europe, for over 700 years. Ibn Sina's work is still studied and built upon in the East.

Other significant contributions were made in pharmacology, such as Ibn Sina's Kitab al-Shifa' (Book of Healing), and in public health. Every major city in the Islamic world had a number of excellent hospitals, some of them teaching hospitals, and many of them were specialized for particular diseases, including mental and emotional. The Ottomans were particularly noted for their building of hospitals and for the high level of hygeine practiced in them.