

Islamic Civilization
World History
Kienast

Though historians often concentrate on the spread of Islam and the methods used in that spread, it should not be overlooked that the Islamic caliphates played a key role in the development of the world from 600 CE to 1300 CE. New trade routes were established, other trade routes were linked together, and this new trade led to a massive development of languages, technology and innovation.

Trade was the key factor in the spread of Islam through the Mediterranean, along the Silk Roads, and into Africa. Arabs and Berbers use new innovations to strengthen trans-Saharan routes. One new innovation was the *caravanserai*, a type of roadside inn that helped travelers as they worked their way across the vast Sahara. The invention of the camel saddle allowed traders to use camels as pack animals. Ocean trade was helped by some Arab inventions and others that they used and perfected from other societies. Arab traders took the idea of the compass from Chinese traders and developed it into its modern form. Another navigational tool, the astrolabe, may have been invented by Arab traders. A version of the astrolabe was used by previous civilizations, but the Arabs developed the first useful tool. The astrolabe was used to determine the latitude of a ship at sea. Speaking of ships, Arab traders used the first ocean-going vessels, called dhows. These dhows had an important invention: triangular or lateen sails. Trade was also helped by financial innovations such as checks, credit, and banking houses.

Increased trade across the Sahara and in the Indian Ocean led to the development of several key trade cities. Timbuktu, a city in west-central Africa became a meeting place for trans-Saharan traders. Traders from the coastlands traveled up to Timbuktu and exchanged goods with traders from North Africa. On the east African coast, several new trade cities such as Kilwa arose. Cities such as Kilwa provided a way for Africans from south and central Africa to trade with Indian Ocean traders. Islamic traders also expanded trade into Southeast Asia, leading to the importance of Melaka as a trade city. Melaka was an Indonesia port city that served as a trade city between the Indian and Pacific Oceans. At the very least, all trade going between East Asia and South Asia passed through Melaka.

One often overlooked impact from the spread of Islam comes in the area of technology. For most westerners, and indeed for many Arabs, the spectacular achievements of Arabic-language science from the eighth through the 16th centuries come as a startling discovery, as if an unknown continent had suddenly appeared on the horizon. In mathematics, astronomy, medicine, optics, cartography, evolutionary theory, physics and chemistry, medieval Arab and Muslim scientists, scholars, doctors and mapmakers were centuries ahead of Europe. Centers for scientific research and experimentation emerged across Muslim lands—in Baghdad, Cairo, Damascus, Samarkand, Shiraz, Bukhara, Isfahan, Toledo, Córdoba, Granada and Istanbul.

The 1300-year period between the Greek golden age of science (from the fifth century BCE to the second century of our era) and the 15th-century Italian Renaissance was perceived as a scientific desert. If Arab scholars were acknowledged at all outside academia, they were seen merely as useful messengers, conduits who preserved the classical Greek knowledge of Euclid, Aristotle, Hippocrates, Galen, Ptolemy, Archimedes and others through Arabic texts.

True enough, much of ancient science came back to Europe via Arabic translations, which were subsequently translated into Latin and other languages. But simple preservation of old ideas is not the startling find about Muslim contributions. The startling discovery comes in the area of science.

Drawing principally from Greek texts, but also Persian and Indian sources, medieval Islamic scientists made a staggering number of breakthroughs. The brilliant ninth-century Baghdad mathematician Muhammad al-Khwarizmi invented algebra, initially to resolve property disputes (even though countless generations of high school students wish he hadn't bothered). He also solved linear and quadratic equations using algorithms, the basis of computer programming; the term itself is derived from his surname, testimony to al-Khwarizmi's enduring gift to mathematics.

Arab astronomers and cartographers strove for—and frequently achieved—uncanny accuracy. Arabic/Muslim achievements in medicine were also impressive. The ninth-century Persian doctor Muhammad al-Razi, known in Latin as Rhazes, penned the first treatise on smallpox. Another Persian doctor, Abu Ali ibn Sina, or Avicenna (980–1037), compiled *Qanun fi 'l-tib* (Canon of Medicine), a five-volume compendium of Greek and Islamic healing that became one of the principal textbooks in European universities centuries later. Even before the consolidation of the Islamic empire, the Arabs sought to raise the abysmal standards of public health, with the first Muslim hospital opening in Damascus in 706. One of the great successes of Arabic medicine was the organization of hospitals at a level that far surpassed Greek, Roman or Persian models. Chemistry, a word derived from the Arabic *al-kimya*, was vigorously promoted, fostering a rigorous routine of trial-and-error experimentation that did not become widespread in Europe until the 18th century.

Another advancement in science was the development of new agricultural techniques. Islamic farmers began to become experts in identifying suitable soils and by mastering grafting techniques for plants and trees. If soils were not suitable, they were amended with fertilizers, another new development. Vegetables were available all year round, obviating the need to dry them for winter. Citrus and olive plantations became a common sight, while market gardens and orchards sprang up around every city. All this involved intense pruning and imposing heavy demands on land fertility but the technique of intensive irrigation agriculture with land fertility replacement solved this problem.

Language was also a development of trading Arabs. Swahili, the dominant language spoken in East Africa, contains Arabic, Persian, and Hindi words. This linguistic synthesis is evidence that extensive trade existed between Arabs, Africans, and South Asians. Arabic also had a profound impact upon Turkic languages. Spoken since ancient times from Southwest to Central Asia, Turkic languages evolved to include as Arabs spread out of Arabia and into Turkic areas.