ISLAM AND CIVILISATION

INTRODUCTION

You would be surprised to learn that the Islamic Empire took less than 100 years to build, essentially the shortest such emergence in recorded history. After the establishment, the progress within the civilisation was astounding. It continued to lead the world of science for nearly 1000 years. We need to ask questions of what the main inspiring force behind the lightening speed of the rise of the Islamic civilisation was, and why it continued to grow and expand for at least five centuries.

Before Islam, the Arabian Peninsula was not at the forte of development, rather it was steeped in tradition. After the revelation of the Qur`an, we found the message of Islam constantly urging humankind to think, learn, observe, and explore the bounties created by God for human use in their role as trustees on earth.

"Say: Are those who know equal to those who do not know? Only they will remember [who are] people of understanding."
(Qur`an 39, 9)

For several centuries, the language of the Qur`an (Arabic) was the international vehicle for scientific research and advancement as English is today. Europeans who wanted to study physics, chemistry, mathematics, astronomy or medicine had to flock to Muslim universities, especially in Muslim Spain.

This enthusiasm for learning could only be matched by the attitude of tolerance that recognised and encouraged scholars regardless of their religion.

Timeline

613 Hijra of Prophet Mohammad

600 CE

700

800

900

1000

1100

1200

1300

1400

1500

The first hospital was built in Damascus in 707

Al-Fazari builds the astrolabe; the most important astronomical calculating device before the invention of digital computers

Muslim Chemist Jabir ibn Hayyan discovers Nitric Acid and describes the operation of evaporation, filtration, sublimation, melting, distillation, calcination and crystallisation

Al-Battani is the first to use the expressions "sine" and "cosine"

The Caliph Al-Ma'moon estimates the earth's circumference to be 24,000 miles; a very close figure to one arrived at by the most modern means today

Ar-Razi (Rhases) presents the first ever clinical report on smallpox that includes a method for vaccination

Ar-Razi, determines that the stars were moving and varied in distance from the earth

869 physicians applied for licensing examination in Baghdad

Muslim astronomers arrive at the figure of 33 20' for the latitude of Baghdad - a margin of error of only 10'

Mohammad Bin Musa Al-Khawarizmi develops Algebra and gives his name to algorithms

Az-Zahrawi (Abulcasis) was a Muslim surgeon who introduced over 200 surgical instruments, some of which are prototypes of ones used today. Also his practice of using ink to mark incisions is still a standard operating procedure in the present day

Ibn Yunus Al-Masri discovers the pendulum and documents its oscillatory motion

Abul-Wafa discovers the 3rd Lunar inequality the same discovery that was attributed nearly 1000 years later to the Danish Astronomer, Tycho-Braho

Ibn Sina (Avicenna) writes Canon of Medicine (14 volumes). This is considered the most famous book in the history of medicine and for over 700 years was a standard medical reference in Europe

Operations to remove cataracts were first performed in Iraq

Mohammad Bin Ahmed revolutionises mathematics by inventing the concept of zero (Sifer in Arabic, from which the term Cipher and decipher were derived). It was not until 300 years later that Europe began to understand this concept

Al-Biruni was among those who laid the foundation for modern trigonometry

Al-Biruni proposes that the Earth rotates around its own axis, calculates the Earth's circumference, and fixes scientifically the direction of Mecca from any point of the globe

Al-Jazari invents the crank-shaft which translates rotary motion into linear motion and is central to much of the machinery in the modern world, not least the internal combustion engine

Ibnun-Nafees explains the circulatory system 300 years before the birth of Sir William Harvey, to whom this discovery is credited

Abul-Hassan Al-Marakishi lists the coordinates of 130 places

Piri Re'is the Ottoman, creates the famous 'Map of America' which clearly shows Antarctica, as well as the Andes Mountains of South America

Medicine

Muslim interest in health care is related to Islamic teachings. It is reported that Prophet Mohammad said: *"All worthy men of Allah, seek medication for Allah did not create a disease without creating a cure for it." (Reported by Abu Dawood)*
Muslim physicians made outstanding contributions in the field of medicine. The first hospital was built in Damascus in 707CE, and soon most major Islamic cities had hospitals which pioneered the practices of diagnosis, cure, and prevention.

Mathematics

Muslim mathematicians made significant advances in maths. They introduced the zero, algebra and algorithms to the world. They were also the first to use the sine and co-sine. Trigonometry is developed as a distinct branch of mathematics. They also have a major influence on the development of non-Euclidean Geometry. Their achievements opened the door to higher mathematics.

Astronomy

"And it is He who placed for you the stars that you may be guided by them through the darknesses of the land and sea. We have detailed the signs for a people who know." (Qur`an 6, 97)
Among Muslim achievements is the discovery of the sun's apogee (the points farthest from the Earth in the orbit of the sun). They drew a catalogue of maps of visible stars giving them Arabic names, corrected the sun and moon tables and fixed the length of the year.

Chemistry

Muslim scholars refute alchemy and established the basis of modern chemistry. Many of the discoveries made by the Muslim chemists have become part of our modern chemical world. In fact, many English terms in chemistry originated from Arabic, terms such as: camphor, alcohol, elixir, alkali and syrup.

Geography

While Europe believed that the earth was flat, Muslims were using globes to study geography. Writing in the 12th century, the Muslim geographer, Al-Idrisi said: *"The Earth is round like a sphere and water adheres to it through a natural equilibrium which suffers no variations."* Islamic interest in geography sparks from the duty of sharing the message of Islam with the world.

Engineering

Valuable contributions to the field of engineering have been made by Muslim engineers. Al-Jazari wrote a book describing fifty mechanical devices in six different categories. Another great work is "The Book of Ingenious Devices" written by Banu Musa. In it they describe a total of 100 devices and how to use them. Some of the inventions included are: the valve, float valve, feedback controller, a programmable machine, trick devices, and self-trimming lamps.

Trade / Money / Coins

Trade played a huge role in The Muslim world. Some historians report that up to 850 Muslim ships were docked in the port of Canton (China) at one time. Islamic coins were found as far off as Scandinavia. A golden Anglo-Saxon coin carried the name of King Offa Rex of Mercia on one side; the Muslim declaration of faith on the other. The modern cheque comes from the Arabic saqq, a written vow to pay for goods upon delivery to avoid transporting money across dangerous lands.