



1,001 inventions mark Islam's role in science

Written by **Claire Gemson**

IF YOU are reading this article over your customary Saturday morning coffee - spooning through the thick frothy milk to reach the restorative dark stuff beneath - then you may be surprised to learn you owe this civilised daily ritual to a herd of curious goats.

Many people have read the story of Marco d'Aviano, a 17th-century monk from the Capuchin order, whose brown robes gave us the name for the cappuccinos now quaffed on every street corner.

The coffee itself, though, is all down to an Arab herdsman called Khalid, who lived far earlier (in the ninth century). He noticed that his goats seemed to have a new lease of life after they had grazed on a particular wild coffee berry, which grew in his native Ethiopia. Khalid - possibly feeling a little tired after tending to his wandering goats - decided to try the berries for himself by boiling them. The resulting liquid was al-qahwa. As the drink traversed through the centuries on the coat tails of trade and travel, the first European coffee house opened in Venice in 1645.

The account of Khalid's discovery is just one of a glittering treasury of untold tales from a golden age of discovery and innovation, which took place in the Islamic world between the seventh and 17th centuries.

It is this hidden history that a new exhibition aims to unveil. Entitled 1,001 Inventions, the exhibition opens at Glasgow Science Centre later this month and charts the innovations of exceptional scholars, and ordinary people, from the Islamic world who discovered and developed many items that are taken for granted today. The exhibits are divided into seven zones: home, hospital, market, school, town, universe and world.

Professor Salim Al-Hassani, chairman of the Foundation for Science Technology and Civilisation, creators of 1,001 Inventions, said there is a widespread misconception that science and technology withered during the "Dark Ages".

"The 1,001 Inventions exhibition aims, through a process of education and learning, to challenge this myth and celebrate the fact that Muslim civilisation was flourishing and contributed to the advancement of our society today," he said.

A stellar vein of such contribution was in the field of astronomy. From astronomical instruments to observatories, Muslim scholars brought a breathtaking amount to the science of the stars and laid the foundation for the renaissance astronomy of the west. Copernicus, for example, reportedly used the astronomical treatise of Muslim astronomer Al-Battani, whose body of work included star catalogues and planetary tables. Al-Battani also popularised trigonometry. He lived in the ninth century and, from that time onwards, Muslim stargazers undertook a wealth of work.

In the tenth century, the Persian astronomer Abd al-Rahman al-Sufi cast his eyes upwards to the awning of stars overhead and was the first to record a galaxy outwith our own. Gazing at the Andromeda galaxy he called it a "little cloud" - an apt description of the slightly wispy appearance of our galactic neighbour.

The Muslim world, ahead of its time, also had knowledge of the Earth. Twelfth century geographer Al-Idrisi, a European Muslim, produced an atlas comprising 70 maps. The atlas, known as the Book of Roger, showed the Earth as being round. The idea that the Earth was spherical was common among Muslim scholars.

Dr Robert Massey, of the Royal Astronomical Society, regularly talks on the topic of Islamic astronomy. He said: "The Muslim world provided a bridge between antiquity and the renaissance.

"The progress made in places like the great observatory in Samarkand, in modern-day Uzbekistan, laid the foundations for the science we take for granted today. And being challenged on how science and faith can co-exist and interact is one of the most stimulating things I've done - it makes you aware of misconceptions that exist across communities."

Many stars have Arabic names - from Aldeberan (one of the brightest stars in the night sky), to the stars of the Summer Triangle (Altair, Deneb and Vega).

Stars aside, the lexicon of science is peppered with Arabic words, each with a story to tell about its Islamic heritage. The Arabic word for chemistry is alkimia: the word became alchemy in the west but its original meaning was chemistry.

Jabir ibn Hayyan, who lived in Persia in the eighth century, is widely regarded as the founder of chemistry. He invented many of the basic processes and equipment still used by chemists today such as distillation (a way of separating chemical substances).

Jabir worked tirelessly in his laboratory, reportedly saying: "The first essential in chemistry is that you should perform practical work and conduct experiments".

This may seem a simple sentiment to today's scientists but, more than 1,200 years ago, it was on the cutting edge. Jabir's rigorous approach to experimentation led to the discovery of powerful acids, which are now key to the chemical industry.

Scottish astrophysicist Andrew Conway, who runs scientific consultancy Counting Thoughts, has an Iranian mother, who is also a scientist. Conway grew up in Scotland but is well versed in a heritage that has remained hidden to many of us. He said: "There is so much that we take for granted that has come from the Muslim world. For example, we write with Roman letters but use Arabic numerals so the influence extends to something as basic as 1,2,3."

Conway said acknowledging the contribution of the Muslim world was not about rewriting history but was more about finding a long-missing piece of the jigsaw.

"It's like uncovering some unread chapters of the world's most interesting book," he said.

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