

The right perspective

A science exhibition, 1001 Inventions, that runs till June 30 in London and is due to be held in the UAE later this year, showcases the remarkable contribution of Islamic civilisation to science. Shiva Kumar Thekkepat talks to the architect of the exhibition, Professor Salim Al Hassani.

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A replica of 'Elephant Clock', which was made in the 13th century by master engineer Abu Alez Al Jazari

Image Credit: Supplied

Image 1 of 3

A group of school children is spending the day at a museum investigating the discoveries in science in various eras of history. The teacher hands the assignment for 'The Dark Ages' to three children, warning them sympathetically that they are unlikely to find much, if anything. Thus begins a short film, 1001 Inventions and the Library of Secrets, starring the Oscar-winning actor Ben Kingsley, that introduces the exhibition.

The unenthusiastic trio approach the librarian, played by Kingsley, who proceeds to prove to them that the Dark Ages was anything but. The librarian morphs into Badi Al Zaman Abul Izz Ibn Ismail Ibn Al Razzaq Al Jaziri, also known as Abu Alez Al Jazari, a mathematician and inventor considered one of the fathers of modern mechanical engineering.

Al Jazari then proceeds to give them a crash course in history. He conjures up secrets from the period and brings in various scientists and philosophers to explain them to the children. They include Abu Al Qasim Al Zahrawi, a tenth-century doctor who invented many surgical tools and pioneered the use of catgut sutures to stitch internal wounds, a technique still used today, and Ibn Al Haitham, whose discoveries led to the invention of the camera.

This then is the introduction to the landmark exhibition 1001 Inventions: Discover the Muslim Heritage in Our World, that is on at the Science Museum in London till June 30. It traces the glossed-over period of a thousand years of science from the Muslim world, starting from the seventh century. The global touring exhibition, which was launched in the UK in 2006, highlights scientific and technological achievements made by men and women of different faiths and cultures that lived in the Muslim world.

"People talk about the Dark Ages - the 1,000-year period following the fall of the Roman Empire until the Renaissance," says Professor Salim Al Hassani, Emeritus Professor of Mechanical Engineering and an Honorary Professorial Fellow at the School of Languages, Linguistics and Cultures, Faculty of Humanity at the University of Manchester, and founder of the 1001 Inventions global education initiative, in an email interview. "Well, it may have been 'dark' in northern Europe, but it was sunny elsewhere: in Muslim Spain, Italy, the Golden Middle East, China and India, science and technology were flourishing!"

He says that later Muslim scholars provided Western Europe with scientific texts, concepts, discoveries and inventions that paved the way for the great discoveries made during the fertile period from the 16th to the 19th centuries, from Copernicus to Darwin. "Isaac Newton said, 'If I saw more than others, it was because I stand on the shoulders of giants,'" he reminds us.

However, as Al Hassani points out, history tends to tell a different story, emphasising Western innovators such as Newton, and neglecting the influence of other cultures during the Dark Ages. As chairman of the board of trustees of the Foundation for Science, Technology and Civilisation (FSTC) - a Manchester-based non-profit organisation that aims to promote an accurate account of Muslim heritage and its contribution to present-day science, technology and civilisation - he was keen to correct this imbalance.

In 2005, the FSTC was awarded a Wellcome Trust People Award that, along with funding from other organisations, was used to develop the exhibition.

"The reasons we created the 1001 Inventions project are diverse, but there were two important aims," says Al Hassani. "Firstly, many people are unaware of the achievements in science, technology and the arts that occurred outside of Europe during the thousand-year period from the 7th century onwards. It is a period in history that deserves more credit than it receives. 1001 Inventions provides an accurate understanding of how scientists of many different faiths, working within Muslim civilisation, have had a huge but hidden impact on our modern world. The legacy of scientists and scholars from that time can be seen all around us, and this exhibition introduces the public to a world that is often misunderstood and under-appreciated."

This observation gave him and a group of volunteers the impetus to research in order to fill that gap 14 years back. "About ten years ago we set up the foundation that gave birth to a book and the related exhibitions," says Al Hassani.

The FSTC is made up of about 60 scientists of which half are volunteers. These people work on the original manuscripts of scientists who lived in the Muslim world, remodel their inventions digitally and, if possible, make life-sized models of them. After 14 years of work, the FSTC has gathered an impressive amount of information about scientific innovations introduced by Muslims.

Yet, Al Hassani believes that they have only scratched the surface. "When we ask the experts on the manuscripts, they say that there are a minimum of 5 million manuscripts in the archives of the world. Only 50,000 of them have been worked on up to now. In future, we may find new names, even new sciences."

Even as it is now, the exhibition is said to be an absorbing piece of work. For a start, there are the exhibits that help illustrate the various inventions: an ornate astrolabe used to measure the position of stars and planets; an 11th-century alembic used to distil chemicals; and a plate with rows of numbers all adding up to the value of 194, among others.

However, there is a more spectacular side to the exhibition, which is aimed at family audiences, says Al Hassani. For example, there is a reconstruction of the great clock designed by Al Jazari. Powered by water, the 16-foot-high machine marks each half hour with rattling drums and moving serpents.

Even more spectacular is the exhibition's astronomy display. In a darkened room, stars shine on a huge screen.

Simply by moving a hand, a visitor can then select one of several constellations and move each across the screen until it fits over the correct part of the sky. It is this aspect of the exhibition that Al Hassani calls his second aim in putting it up.

"There is currently less enthusiasm for science and technology among young people than is desirable," he says. "As a society, our future success depends on bringing to fruition the talents and imagination of our youth. The 1001 Inventions exhibition addresses this issue by highlighting role models from the history of science. By doing so, we hope to inspire young people of all backgrounds to choose careers in science and technology." He also feels that it is important to demonstrate that science is a subject where artificial barriers should not exist.

"This exhibition highlights how men and women, from many different parts of the world, many from humble backgrounds, were able to make a lasting impact on the world in which they lived and their legacy still survives today," he explains. The exhibition's latest run goes on till June 30. It is expected to travel to most parts of the world. The UAE is on the list, after this year or early next year.

There have been spin-offs from the exhibition such as the book by the same name. "We wanted to show that Islam has other 1001s that were the founding stones of our current civilisation," Al Hassani says.

The book introduces names like Abbas Ibn Firas (circa 887) who produced the first flying machine; Al Jazari (circa 13th century) who produced the Elephant Clock and other mechanical devices; Al Kindi (circa 873) who wrote 361 works on a variety of subjects including chemistry, logic, music and astronomy; Fatima Al Fihri (circa 841), a female scientist who founded one of the first universities of the classical era; Ibn Al Haitham (circa 1039) who wrote the principles of optics which paved the way for the invention of the first photographic camera; master architect Mimar Sinan (circa 1588), who built the most magnificent buildings of the Ottoman era, and Zheng He (circa 1433), the Chinese-Mongol Muslim admiral who built one of the largest military fleets in human history.

Of course the title for the exhibition, drawn from the number 1001, is deliberate. The number was chosen by design and is not a literal count of the inventions.

1001 inventions

The exhibition is divided into seven zones:

The Home Zone It looks at how ideas from Muslim civilisation have influenced modern everyday life, for instance:

- The model of an energy efficient and environmentally-friendly Baghdad house showing natural air conditioning
- Shows ideas from Muslim civilisation that are seen in our homes today through chess, coffee, toothbrushes, toilet soap, conservatories, fountain pens, cameras and music

The Market Zone Examines how travel and trade in Muslim civilisation brought new ideas for farming, supplying energy and producing goods such as:

- The pumps, water wheels and windmills that powered towns and farms
- How new agricultural methods encouraged the spread of crops like aubergines and rice
- The School Zone Looks at the links between universities, libraries and learning in Muslim civilisation and today. Examples include:
- The development of algebra, trigonometry and geometry - and the secret behind the way we write modern numbers
- How English words such as sofa, giraffe, orange and shampoo came from Arabic, and Hindi through interaction between the cultures

The Hospital Zone Introduces how medical knowledge from Muslim civilisation has influenced medicine today, for example:

- The rise of state-funded hospitals and welfare systems
- A look at how little the treatment of bone fractures has changed since the tenth century
- Al Zahrawi, a surgeon
- The Town Zone Exhibits explore the shared heritage of architecture between the modern world and Muslim civilisation as evidenced by:
- The spread of domes, arches, vaults and towers that are visible today in important buildings across the East and West
- The link between a visit to the spa today and bathing in the hammams of Muslim civilisation