

## NOTES & THEORIES

DISPATCHES FROM THE SCIENCE DESK



### From Arabick Roots to the Arab spring

The Arabick Roots exhibition at the Royal Society helps to correct the 'clash of civilisations' view of the history of science



Pages from *The Maintenance of Health* by Ibn Butlan (11th century), on display at the Royal Society's Arabick Roots exhibition. Photograph: Royal Society

Alkali, algebra, algorithm, alembic. Spotted the pattern? It's no coincidence that many scientific words in English contain the Arabic definite article. In recent years, historians and scientists such as [Jim al-Khalili](#) have done a fantastic job of shedding some light on the Arabic origins of modern science (Arabic here referring to all cultures that made use of the script, rather than just the Arab people).

In particular it's the "golden age" of Arabic science, between the 8th and 13th centuries, that gets all the press. So while the Vikings were romping around northern Europe, the 8th century Persian mathematician [al-Khwārizmī](#) was developing solutions to quadratic equations. While Alfred the Great was busy fending off those Vikings, the Arab polymath [al-Kindi](#) was introducing Indian numerals into mathematics, and the Persian physician [al-Razi](#) was conducting a study into the differences between measles and smallpox.

That's algebra, smallpox and numbers, all sorted by the end of the 9th century. The Arabic contribution to science is certainly impressive, but what happened next? Did the west's scientific revolution just kick in, allowing Europeans to pick up where Arabic science left off: a neat end to one scientific culture, and the beginning of another? After a public tour of the Royal Society's latest exhibition, *Arabick Roots*, I can report that the answer is a resounding "no".

This was something our guide, curator [Dr Rim Turkmani](#), was keen to get across. Arabic science did not abruptly stop. The exhibition gives us a flavour of how, just as we hit the 17th and 18th centuries, European and Arabic thought started to intermingle. There was certainly a good deal of translation, but in many cases the Royal Society had direct contact with Arabic scholars.

Dr Turkmani showed us the Royal Society Charter Book, a great tome of vellum containing the signature of every Fellow, and there, signed in Arabic, were the names of the first three Arab Fellows of the Royal Society.

Our guide led us down a grand marbled staircase to a cabinet entitled 'From inoculation to vaccination'. Ahh, vaccination. We know the story: noting that milkmaids rarely suffered from smallpox, Edward Jenner reasoned that cowpox could be used to vaccinate against the disease. For this he is championed as the 'Father of Immunology'. But almost 70 years earlier, one of the first Arab Fellows, [Cassem Aga](#), was teaching the Royal Society about the inoculation techniques practised in Tripoli. Dr Turkmani explained how, in the letter on display, Aga expressed his bafflement: how could Europeans be unaware that a mild dose of the smallpox virus could prevent a healthy individual contracting the disease? "Cassem Aga couldn't remember a time before inoculation," said our guide. "It had been going on in the Arab world before anyone could remember."

This was exactly what I had been hoping for: the chance to cut our heroic western scientists down to size. Forget Jenner, it was Arabic science that saved us from smallpox! But when I ventured this opinion Dr Turkmani corrected me: "I want to combat the idea of a clash of civilisations," she said. Which is a much more positive message than my attempt at point scoring. Jenner's contribution was extremely important, as cowpox is a much safer vaccine, she said, but it was Arabic scholars who set the ball rolling.

As we continued, it became clear that neither Arabic nor European science acted in isolation. Dr Turkmani pointed out a sheet of paper covered in circles, right-angled triangles and parallel lines. We were looking at [Alhazen's problem](#), a real trigonometric nightmare. Set by the 10th-century Iraqi polymath [Ibn al-Haytham](#), the challenge is this: given points A and B exterior to a circle, find a point C on the circle such that the angle ACB is bisected by the diameter through C.

Got it yet? Don't fret. An algebraic solution was only discovered in 1997 by Oxford mathematician Peter Neumann. al-Haytham had completed a geometric proof and in the 900 years between, various Arabic and European scholars contributed suggestions. The medley of points and planes you can see at the exhibition is [Christiaan Huygens's](#) 1673 attempt.

As the tour wrapped up, I asked Dr Turkmani about Arabic science today. She was to the point: "The Arab Spring has demonstrated the people's desire to be free to pursue knowledge." She cited increased scientific activity in Egypt since the fall of Mubarak. Ultimately, she said, "there is one civilisation: we all contribute."

And so it strikes me that, while Arabick Roots does not have an agenda, it does have a message. Arabic science isn't something alien, confined to a "golden age" in the past. From smallpox to Alhazen's problem, it has kept contributing: a continuous part of a global scientific culture that has never gone away.

*James Poskett is a freelance science writer specialising in the history and philosophy of science*