

begin to feel that the unthinkable can become at least explainable.

Cliff's alleged fraud is not of the audacious variety epitomized by physicist Jan Hendrik Schön, whose deception led to the retraction of a string of papers in high-profile journals. It is much more interesting, involving cosmetic acts so unconscious that we never know for certain whether they have even taken place, a circumstance that may prevail in many cases of fraud. Aspects of Cliff's data "were so compelling that in his mind they outweighed everything else. He had sifted out what was significant, and the rest had floated off like chaff." Almost unwittingly, the lab colludes. Infected by Sandy's reckless ebullience, Marion throws caution to the wind: "Doubt had been her scientific ally, the whetstone for her sharpest emotions. Now she struggled against doubt as if it were merely an emotion, and not also a kind of intelligence."

Despite its deft illumination of laboratory

wrongdoings, *Intuition* has a more serious message about modern science as a career: far from fulfilling, it is actually psychologically damaging. Scientific similes subtly reinforce this: a Chinese postdoc wears his nonchalance "like safety glasses"; Sandy shoots a wounding look "like liquid nitrogen"; Robin is hurt to be "treated like hazardous material, to be isolated and manipulated with gloved hands".

And postdoctoral angst? It's all here: the dead-end project bestowed with misguided fanfare by a new mentor; fear of being scooped; fear of having to leave the bench to teach; fear of irreproducible results; fear of running out of funding. As early as the first chapter, Cliff's despair "began to melt and pool inside him" until "he was no longer desperate, but simply demoralized and depressed — emotions entirely accepted, even expected, in the lab". Of another postdoc, we learn that patience, diligence, sarcasm and pessimism "all protected

him from failure and hurt". Science is a "dirty game", a "cosmic joke".

Although the book ends in redemption, the aftertaste is still bitter. The scientists have lists of amusing definitions ("experiment: a series of humiliations"), leave warning notes on refrigerators, and engage in postdoctoral banter; such playful antics are astutely observed and very funny, but in the end cannot mitigate the fundamental darkness. All the negative things described in the book ring true, although their concentration in one lab seems to artificially inflate the difficulties of the profession and blunt its periodic joys. Yet in the end, negative aspects make good reading; any 'lab lit' novel set in a world as technical as molecular biology must dwell on obstacles to keep the pages turning. And turn they most certainly do. ■ Jennifer Rohn resides in London, UK. She is a former molecular virologist and is now the editor of LabLit.com.

The zenith of Islamic science

An exhibition in Britain explores a rich scientific heritage.

Philip Ball

"It is sad to relate that no great invention has come for many hundred years from Muslim countries." Comments such as this, from former Archbishop of Canterbury George Carey in 2004, are part of the subtext for *1001 Inventions*, an exhibition on view at the Manchester Museum of Science and Industry until 4 June, which describes contributions to science and technology that have sprung from the Islamic world.

Mechanical engineer Salim Al-Hassani explains in his accompanying book, also titled *1001 Inventions* (Foundation for Science Technology and Civilisation, 2006), that the exhibition was motivated by the perception of a hiatus in Western science and technology lasting well over a thousand years. While many traditional histories of science jump from Archimedes in the third century BC to Gutenberg in the fifteenth century AD, it was during this intervening period that Islamic culture and science reached its zenith (itself an Arabic astronomical term).

The exhibition is particularly timely given the recent tensions between the Western and Islamic worlds. But there has also been a resurgence of interest among Muslim scholars in the evolution of Islamic belief and its relation to the philosophical and scientific traditions of European culture.

There will be few surprises for scientists



Vaults like this one at Isfahan in Iran may have led to the Gothic rib vault.

among the plethora of inventions and discoveries on display. Common scientific words such as alcohol, algebra and alkali are a constant reminder of the debt that contemporary science owes to the Persian and Arabic scholars of the sixth to the eleventh century AD. But it is a debt that receives little public acknowledgement — Western schools, deplorably, still teach of this being the 'dark ages'. As an educational resource the exhibition is impressive. Indeed, even enthusiasts of science history are likely to find something here they did not know: Ibn al-Jazari's exquisite water clock, perhaps, or Ibn al-Mosuli's cataract operations.

The danger is that by trying to redress the imbalance, the exhibition claims too much and clarifies too little. Bald statements of priority, such as that the Gothic rib vault originated in the mosques of Toledo and

Cordoba, or that the European university stems from the organization of Muslim scholarship, are striking but, without any sense of the historical progression, it is like saying that Charles Babbage invented the Apple Mac. The claim that Jabir ibn Hayyan was the founder of chemistry, and the assumption that this eighth-century Muslim scholar was the author of the entire Jabirian alchemical corpus, ignores a great deal of careful scholarship.

The impression that Islamic science sprang up of its own accord is misleading too — not enough is said about how (or why) it helped to preserve the knowledge of classical and Hellenistic Greece. Nor does the exhibition provide much sense of how this learning found its way to the West, a story of cross-cultural exchange that was all the more remarkable for coinciding with the Crusades.

Perhaps this is too much to expect of an exhibition aimed largely at a younger audience. But it is a shame that it fails to address the crucial question of why Islamic pre-eminence in science ended just before the European Renaissance. That is, after all, the point to which Carey was alluding (if not in the most helpful language), and it is one that Muslim scholars are now keen to debate. It would do the riches of Islamic culture no favours to pretend the question does not exist. Philip Ball is a consultant editor for *Nature*.