

Science's spiritual side

Some view science and religion as mutually exclusive. Most feel there is some conflict between them. But this has not always been the case, Katharine Sanderson discovers



John Hedley Brooke

John Hedley Brooke turned his back on the thrills of lab-based chemistry as a young man. Instead, he chose to explore the history of chemistry and the philosophy of science. His career eventually led him to be professor in science and religion at the University of Oxford, and president of the International Society for Science and Religion. Now in semi-retirement, Brooke talks to Katharine Sanderson about how science and religion might not be as incompatible as popular culture suggests, what famous chemists of yore were actually thinking at the time, and what turned a promising organic chemist into an historian.

KS: You started out as a fledgling chemist. What made you change from the lab to the library?

JB: It was a tough choice between chemistry at university and doing something like English, French or even music. One very significant feature of my last couple of years at school was a chemistry teacher who was also a Methodist preacher. He taught an examinable course on the history and philosophy of science. I found it great, because on that course you really had a chance to express your own opinions and evaluate arguments. So when I left for

Cambridge University to study chemistry, the history and philosophy of science had already been imprinted upon me.

During my second year in Cambridge I began to have some doubts about whether I wanted to spend my career as a research chemist. It's a not unknown phenomenon. But the problem was that I was rather good at chemistry, so was put under quite a lot of pressure to pursue a straightforward chemical career. In the end I was just honest with myself and recognised that I really didn't want to spend the rest of my life in a chemical laboratory, however thrilling it might be.

It was then I remembered how much I enjoyed history and philosophy of science. There was this wonderful system in Cambridge in the early 1960s, you could get an honours qualification in chemistry in two years. So I studied history and philosophy of science in my third year as an undergraduate and then went on to do a doctorate in the history of chemistry.

KS: What started your interest in the debate between science and religion?

JB: During my teenage years I was exposed to a certain kind of evangelical Christianity and



Sir Isaac Newton might be surprised by the present day antagonism between science and religion

for a few years that reinforced my interest in philosophy of science. I wanted to get to the bottom of questions concerning the authority of science and what science really had to say on matters of biblical exegesis for example. I will also say that though I moved in those evangelical circles for a while, I also often felt very comfortable with it and my own position was always at the very liberal end of the evangelical spectrum. Eventually I felt that to get to the bottom of these questions, I had to study not only the history and philosophy of science, but I had to take theology seriously. So I became an autodidact, reading books by reputable theologians.

When you've studied the history of science, particularly in the period we usually call the scientific revolution, you suddenly realise that what we like to extract from that period

'Newton said it is the business of natural philosophy to discuss God'

as good science was at the time very much embedded in philosophical and theological discourse. What we call natural science today was called

natural philosophy then.

It comes as a surprise in our modern secular culture that there was so much theological reflection and presentation of scientific ideas using religious language. Sir Isaac Newton, for example, said it is part of the business of natural philosophy to discuss God and his relationship to the world. So there was no separation. I began to realise that if one were to be faced with the context in which modern science was forged, one simply had to take religion into account.

KS: Is spirituality acceptable to scientists today?

JB: That's a really interesting question. I certainly know scientists who are committed Christians and who in certain contexts would be happy to say so. But they would also say that within the culture of science it would be considered rather weird to admit that they had those interests. Interestingly, scientists who would decline to discuss religion among their peers for fear of seeming rather weird, when they address the wider public are quite happy to go on the offensive and talk about these things.

KS: Do you consider it weird for scientists to talk about their spirituality?

JB: Not really. And the reason I say that is that although I'm a thoroughgoing scientific naturalist myself, I also recognise that there are what philosophers sometimes call limit questions - questions beyond which science doesn't seem able to take you. A classic example is: why does anything exist at all? It seems a pretty deep mystery to most people. Another example is science and ethical



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The invention of the microscope (top) revealed a world that had never been seen before - but which scientists were able to incorporate into their religious worldview

Artificial insulin (right) is an example of a technology, rather than a belief or theory, that is life-changing

values. Science itself raises so many unprecedented ethical problems, particularly in the biotechnology sphere. The question then arises: where do we get the ethical values from? I think religious people often like to believe there are particular insights from their religious tradition.

KS: So the perspective that, as science progresses, secularisation increasingly dominates isn't necessarily true?

JB: That perspective has probably only become significant in the last 20 or 30 years. What we now seem to be more confident about is that there are aspects of human nature which religious beliefs and belonging to a religious community or society can actually meet. And in some ways, it is hard to see how science can meet them, particularly for the man in the street.

It works if you're an elite scientist, because you can build your life around the values that are important to you in the science that you practice. But even as a scientist you have deep existential concerns: Is my theory going to be accepted, is this experiment going to work?

There's a fascinating example: I was talking to somebody who was supervising a Muslim student who had been constructing an experiment to test a hypothesis. He got a negative result and his supervisor said to him 'You must do the experiment again, something could easily have gone wrong with the apparatus.' There were multifarious reasons why the experiment might not have worked. But what's interesting is the lad declined to do so, on the grounds that Allah had spoken in giving the negative result and therefore to do the experiment again was somehow insulting to Allah. I cannot believe that that is typical, but it is a very interesting example of how religious and existential concerns can at least in theory influence the practice of science.

KS: And can it work the other way around? Can science and technology have an influence on the practice of religion?

JB: When I visited Jerusalem for the first time, my wife and I were allocated in the hotel to a room that was immediately adjacent to the elevator so we were very conscious of whenever the lift went up and down. On the first night, the lift just went up and down normally, as you'd expect: when someone wanted to get on at a particular floor they pushed the button and they would arrive there. But during the Sabbath, the elevator automatically stopped at every floor, irrespective of whether there was anybody in it. The elevator had been pre-programmed in such a way that no physical work was being done in order to go up and down, or simply to get back to your room. What struck me about that was that you could read it as obeying the terms of the law but not the spirit of the law because you were using this clever technology to evade what the commandments might say. But more significantly, technology was not destroying religious culture, it was actually helping to maintain it.

If you accept the traditional standard line on secularisation, then technologies, perhaps even more potently than scientific theories, are judged to have been quite deeply influential in changing our perspectives. They give us a greater control over the world. For example, I'm dependant on insulin and even during my lifetime, artificial insulins have been developed which are better than the original article. I do think technologies transform our understanding of the world, but to argue that their effect is always corrosive of religion is where the mistake would lie. Because in the example of the pre-programmed elevator, these technologies are not leading to secularisation, they are helping to reinforce the status quo.



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KS: Have technologies similarly impacted on religion further back in history?

JB: The microscope in the 17th century is a lovely example. With the microscope for the first time you actually uncovered this amazing microscopic world, some of which is quite extraordinarily beautiful. And to people at that time, this showed the glory of God. Robert Boyle (see *Chemistry World*, April 2010, p46) said that he could never have imagined how it was possible for God to create a living thing as tiny as what he was looking at through the microscope. To have packed life into some minute mite was staggering.

Robert Boyle is one of the leading advocates in the second half of the 17th century for a natural theology, because he thinks the study of organic systems simply produces the incontrovertible evidence of a designing and wise God. Boyle believes there are many features of the world which are beyond human understanding. That includes a belief in an afterlife - not something that we can talk about scientifically. So Boyle doesn't believe that science has all the answers. Most interestingly, Boyle is interested in stories about spirits, not just matter. He even thinks that it may be possible if one found the philosophers' stone to have some kind of communication with angels.

A hundred years later, Joseph Priestley wanted to rid both chemistry and religion of spirits. Priestley didn't accept the fundamental dualism between matter and spirits. For him, we should just talk about one thing. At the time it was a fairly radical position. Priestley is a good example of a late 18th century thinker looking to rationalise chemistry and to rationalise religion.

KS: Does this mark a time when scientific discoveries raised questions that seemed to contradict religious beliefs?

JB: There are certain issues which recur when people try to articulate why they no longer have a strong faith. One of the recurring issues is the problem of suffering, which affects everybody in one way or another. The question of suffering is critical for Darwin, and it's critical for a very particular reason because not only does he suffer, living his life after the Beagle voyage often being very ill and finding it quite hard to work, but he sees the suffering of his young daughter Annie who dies at the age of ten. So he like any human being is exposed to suffering. But the key thing is that his theory of evolution by natural selection, which stresses competition and the struggle for existence, puts a spotlight on the problem.

It was actually useful to theologians in the end, because they said 'We were always puzzled by this great mystery of suffering, but now we recognise that suffering has a creative role even in the biological sense.' It was often said that suffering had a creative role in a purely spiritual sense - it inculcates fortitude of spirit. But if you can say that suffering is a natural concomitant of an evolutionary process, there is a sense in which you're giving suffering some kind of legitimisation.

Those in theological circles did actually exploit that idea and Darwin even suggested it himself at one point. It's an interesting issue. His theory puts the spotlight on suffering, the problem which makes it most difficult to believe in a beneficent god. But then the theory almost gives you a way of justifying it. It's another lovely example of the complexity of these historical debates, how they really took place, as distinct from our modern reconstructions of what might have happened.

KS: This contradicts the view of a battle between science and religion or spirituality. Why do we now see them as incompatible, when historically it doesn't seem to have been?

JB: Sometimes it was. There were plenty of religious folk who were hostile to Darwin, it's just that you can't generalise about it. It's very difficult to produce a simple narrative that touches many of the subtleties of the debate.

'Darwin's theory of evolution by natural selection puts a spotlight on the problem of suffering'

Darwin's good friend at Harvard, Asa Gray who was a botanist, a Presbyterian and a very devout Christian, felt that Darwin's theory was a help in the case against slavery. The argument was that if you

accepted Darwin's account of evolution, and that of Alfred Russell Wallace, a contemporary with similar ideas, then ultimately all living things have the same origin. And therefore to claim that one group of the human race was somehow less properly human than others was, in a very deep metaphysical sense, unacceptable.

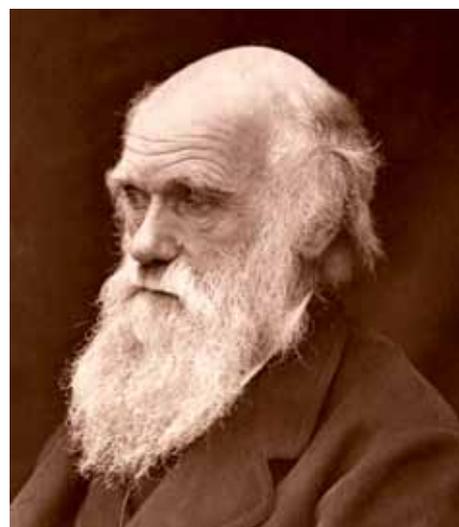
KS: After a career studying science and religion's relationship, how would you describe your spiritual beliefs now?

JB: I certainly could not describe myself in any way as an orthodox practising Christian. How I behave does depend to some degree on context. I recognise sometimes, when I'm working within a community, it would be inappropriate not to participate in what may be the rationale for that group. I don't want to give the impression that I'm just somebody who just shakes with every whim, and I do have some very strong convictions but they're not necessarily orthodox religious kind of things. I'm still deeply sympathetic to the study of theology, and theology as an enterprise. I detect how deeply uncomfortable I am when I hear scientists sounding off about religion in ways that I consider ill-informed and based on whatever particular anti-religious culture they've been exposed to. That feeling of acute discomfort in myself, sometimes even anger, I think is a sign that deep down I have not shed all that I once held to be important. So I hope that in such time that I have left, I will continue at least to remain true to that aspect of the tradition.

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Early scientists, like Robert Boyle (top), had no problem reconciling their discoveries with their beliefs

Charles Darwin (bottom) worried about human suffering, but others saw the suffering implicit in natural selection as legitimising it