BOOK REVIEWS

DAVID KNIGHT

reviews

Sketches Towards a Theology of Science, by the Doctrine Committee of the Scottish Episcopal Church

2004, Edinburgh, Scottish Episcopal Church, 37 pp., £2.50, ISBN 0 905573 64 1

History of science, philosophy of science, sociology of science, these we are used to – but what should we make of *theology* of science? The very word 'theology' became pejorative in the hands of Victorian agnostics and then logical positivists as mere spinning of verbal webs, catching nothing; and despite the efforts of historians, the notion of constant conflict between religion and science persists. Celebrated encounters there have certainly been, but in very different contexts; and the term 'engagement' that John Brooke and Geoffrey Cantor suggested, with its overtones both of marriage and of battles, seems the most appropriate to describe the interaction. Often, theologians nowadays anxious to engage with science have been forced onto the defensive, unless they are conservatives denouncing the 'Enlightenment project'. Now, fortunately remote from the worlds of science wars and creationism, we have an essay or discussion document from the Scottish Episcopal Church on theology of science to take us in a new direction.

The authors, for this is the work of a committee, are tentative in tone: the booklet is meant to stimulate thought and discussion rather than present a thesis, and seems a bit variable in level – perhaps because it does not have a single target readership. It begins with a discussion of the relationship of science and theology, suggesting in place of the 'conflict thesis' that they are two modes of discourse that do not normally collide – liturgical language, like poetry, is different from factual exposition. They look at 'authority' and find it in both scientific and religious institutions – indeed historians have found that looking at 'the church scientific' (to use T. H. Huxley's phrase) is profitable in investigating how science works. The authors pick up some criticisms of science, notably feminist ones of more or less plausibility, but do so to argue that, as in literature, constructive criticism in science should be possible and indeed welcome. They note science's loss of innocence during the twentieth century; and remark (like John Tyndall) on the role of imagination, rather than fixed rules of method, in discoveries: science is not wholly unlike the arts. They make rather too much of Romantic opposition to science, and play down as ignorance the courage of those martyrs of science who have boldly and open-eyed courted danger, perhaps experimenting upon themselves.

The second half is more original, as the authors move towards their theology of science: looking for something more 'godly', urging that science cannot be value-free – and arguing that the disjunction between fact and value has (misconceived) theological roots. They look first at the Wisdom literature in the Bible, where there are not only proverbs but also delight in the creation, in play and in rest, and even in

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seeing things from animals' points of view. Science they hope might contribute to such wisdom.

They then turn to liturgy, focused as it is upon the difference between the creator and the creature, where consecration and symbolism indicate that the material world is not everything, that sacrament and community are crucial, and that science has its limits. The incarnation of Christ reminds the faithful of the risks in creation, and points to a separate sphere for religion. Whereas God is felt to be present in the liturgy, the sphere par excellence of religion, since Laplace's time he seems to have been absent from the natural world, the sphere of science: that means, they say, that theologians ought to be going out and seeking him there, wherever there are implications for human life and flourishing. Science, they conclude, reveals the creator's hand, and all believers ought to think theologically about science.

The booklet has a useful bibliography, and is readable and stimulating if tantalising because it is only a sketch. It is perhaps surprising that there is no Scottish aspect, given Scotland's disproportionately important place in the history of science, technology and education. Indeed, technology might be more emphasised, given the way that its successes have been a practical assurance of the truth of science over the last hundred and fifty years or so (as well as of its moral blindness). This is not new: chemists have always sought to remedy and improve the creation, not just to contemplate it; and this made chemical natural theology rather problematic. The chemist is a creator of molecules not found in nature; and the world is better for having in it metallic aluminium and plastics. Today the urge to improve the lives of our fellows is surely as strong a motive as curiosity in driving people to take up science. But if this booklet provokes further questions, that is what it was meant to do; and those of us who care about and enjoy science must surely welcome the fact that a church's doctrine committee should be taking an informed interest in it, and wish them joy.

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VANESSA MORLOCK

reviews

The Philosophy of Expertise, edited by Evan Seliger and Robert P. Crease

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On the one hand, our society needs experts. Just consider the role of expert-witnesses in the legal system when they make claims about defendants, or their role in science when they review the work or competence of other scholars, or their role in education in teaching students – to mention only three. On the face of it, nothing is more

natural than to ask an expert for advice. On the other hand, this is also quite problematic, because it raises a bunch of difficult questions of which many of us are surely aware: How do we recognise an expert? Why should we trust experts or be justified in believing them? How can we judge them? Why do experts' claims carry greater epistemic weight than those of laypeople? While the first question is perhaps one to which psychologists have already given detailed answers,[1] the others have not yet received the attention they deserve. This is an unsatisfactory situation, and one to which Evan Selinger and Robert P. Crease draw our attention in their edited collection *The Philosophy of Expertise*.

Since Selinger and Crease have called their collection *The Philosophy of Expertise*, one may reasonably wonder why we should explore the topic of expertise with philosophical methods, and what the specific value of a philosophical investigation might be. As the editors explain, their collection

> surveys the key issues which, we believe, are ultimately the key to understanding the practical controversies surrounding issues of experts and expertise. These controversies, in which opposing armies mass on either side of a seemingly firm boundary, provide, we think, a perfect foil for exhibiting the value of philosophical exploration and clarification. *For the role of philosophy is to detect, expose, and rework the confusions and ambiguities that make such boundaries seem intractable, thus giving rise to the conflict.* (p. 2, emphasis added)

Concerning the key issues just mentioned, Selinger and Crease distinguish between 'three different perspectives that one can adopt with respect to the question of expertise. One can focus on expertise as a relation between those who "have" the expertise and those who use or "consume" it, or one can focus on one or the other pole of this relation' (p. 5). Accordingly, their collection is divided into three main parts. Part 1 discusses mainly the relation between experts and laypeople. It introduces the approaches of six authors, namely Alvin I. Goldman, Harry M. Collins, Robert Evans, Scott Brewer, Stephen Turner and Peter Singer. While Goldman is interested in the question of how to decide which experts we should trust, Collins and Evans discuss the 'value of scientists' and technologists' knowledge and experience as compared with others' knowledge and experience' (p. 40). Brewer draws our attention to the way many legal systems use procedures in which laypeople have to judge experts. His arguments will be discussed in more detail below. Turner approaches the topic of expertise in the context of political theory. More specifically, he discusses the problem, *inter alia*, that expertise seems to violate the idea of equality presupposed by democracy. Peter Singer, finally, considers the thesis that there are no moral experts.

Part 2 of *The Philosophy of Expertise* deals not so much with the relation between experts and laypeople, but more with the kind of knowledge experts appear to have, the kind of knowledge that distinguishes them from laypeople. This part of the book comprises articles by Hubert Dreyfus, Evan Selinger, Robert P. Crease, Hélène Mialet, Julia Annas and John Mix. Hubert Dreyfus considers the possibility of substituting face-to-face education in school with a kind of distance-learning via the internet. In order to do this, he characterises the different stages by which a student learns and gradually gains expertise. Selinger and Crease, commenting on this article, note that 'philosophers have rarely addressed the subject [of expertise] explicitly', and that Dreyfus is amongst the few to have done so (p. 214). Mialet presents a case study of two scientists who, according to her, are both recognised as being geniuses. The one is known throughout the world, of the other no one has heard. She brings out several characteristics both scientists seem to share.

Annas argues that the ancient view of moral epistemology, according to which moral conduct has to be viewed as practical expertise, has some attractions. Finally, in the last chapter of part 2, Selinger and Mix consider Harry Collins's investigations into a further form of expert knowledge, namely 'interactional expertise'.

The contributors to part 3 of the book are mainly concerned with the questions whether and how our society is endangered by its experts. Here there are articles by John Hardwig, Steve Fuller, Paul Feyerabend, Edward Said and Don Ihde. John Hardwig wonders whether we are justified in believing experts and whether such belief is rational. In his famous article 'How to defend society against science', Paul Feyerabend takes a critical stance towards science. He compares the way we believe what scientists tell us with the more or less uncritical way most of us believed, until a few decades ago, what church dignitaries told us. Said encourages us to break out of our 'disciplinary ghettos', to distribute information not only amongst our peer-groups, but also to laypeople. Ihde focuses on the question as to why it is so difficult for a layperson to criticise experts' claims.

As indicated above, I will now focus on Brewer's article, 'Scientific expert testimony and intellectual due process'. The topic of this article is especially interesting because it illustrates not only the central role of experts in society, but also their specific role in the decision processes of many legal systems. Moreover, it deals with two different problems arising in the context of expertise: the article touches, first, on the problem of trusting experts already discussed by the authors in the first part of *The Philosophy of Expertise* and, second, on the more political questions arising in the context of expertise.

In his article Brewer asks us to suppose that

> two groups of expert mathematicians disagree about a complex mathematical question—say, whether Princeton mathematician Andrew Wiles really did solve 'Fermat's Last Theorem' which no mathematician had been able to prove since Louis Fermat first propounded it about 360 years ago. These experts have had an opportunity to hear one another's reasons for their competing conclusions about Wiles's proof, and neither group is convinced by the other. How might we decide which of the two groups is making the correct mathematical judgment? Here's a suggestion: Convene a group of twelve or so nonmathematicians, give them an opportunity to hear from representatives of each of the competing groups of mathematicians, and have the nonmathematicians decide whether Wiles's proof really succeeded. (p. 111)

Such a procedure might seem to be at the least unjustified, if not altogether absurd. If there is one group of people who would seem to be most obviously *not* in a position to judge whether Wiles really solved Fermat's Last Theorem, then it is the community of laypeople, of non-mathematicians. They are simply not competent to make any such judgement. However, as Brewer immediately goes on to point out, 'many legal systems, including the state and federal systems of the United States, use decision procedures that are disturbingly close to the one just imagined, procedures in which nonexpert judges and juries are called upon and authorized to evaluate expert scientific testimony' (p. 111). Brewer's basic point is obvious and far-reaching at the same time: In the case of the mathematicians described above, it would seem absurd to suggest that non-mathematicians would be in a position to decide whether Wiles solved Fermat's Last Theorem or not. But if this is an absurd idea in the case of mathematics, it is

surely also absurd to assume that something similar should work in the case of a legal system. On the other hand, a legal system that does not rely at all on the testimony of experts, and so is entirely accessible to laypeople, is also difficult to imagine. This is a kind of dilemma, which I will call in what follows the 'experts dilemma'.

But let us come back to Brewer's article. So far, he has appealed only to the intuition of the reader. What he also has to do is to explain why judges and jurors really do not have the methods or tools to decide which expert is more credible than another, or which of two contrary expert opinions is the one to be preferred. In order to do this, Brewer considers four possibilities. The first is that the non-expert judge or juror should second-guess the merits of the expert's testimony (p. 135). Brewer considers this option for two reasons: first, we have no general justification for ruling out the possibility that judges and jurors are in a position to do so; and second, for some legal systems this option seems to be quite an essential tool: 'At least some prominent legal systems, including the American federal system . . . seem to require that the nonexpert judge *select* experts . . . on the basis of an *epistemically substantive judgement* about the merits of an expert's proffered testimony' (p. 135). Brewer rejects this first option, however, because he considers it to be an 'obviously unsatisfactory solution'.

Brewer's reasoning here is not as clear as it might be, and so it is not immediately obvious why this option is unsatisfactory. His main reason for rejecting it seems to be that it is very unlikely that a judge or juror who is untrained in science will be in a position to assess whether expert testimony counts as scientific knowledge, or whether it has been obtained by scientific means. In order to be in a position to do that, he or she would have had to be trained in science, and more specifically in the scientific method. This, however, can hardly be a convincing argument. Brewer begins by admitting that nothing in principle seems to rule out the second-guessing option, only to point out that it is likely that that same option is epistemically much too demanding for untrained judges and jurors, and so to conclude that second-guessing is therefore an obviously inadequate option. In order to strengthen the argument, one would have to support the second premise with something more than a bare appeal to the intuition of the reader.

Another option for a judge or juror to decide which expert is the more (or most) credible is to pay attention to rational incoherences. This is the second option Brewer discusses. Sometimes, he points out, experts in courtrooms make statements that are contradictory. Such scientists can easily be discarded from the set of all credible experts. In order to be in a position to do this discarding, judges and jurors do not have to be scientists. Now, this way of deciding between two or more competing expert opinions can be a viable option for solving the 'experts dilemma' only if there is a large number of cases in which experts in courtrooms make such rationally incoherent statements that they can be recognised by untrained people as such. And this is the weak point of the second option, at least according to Brewer: 'For at least three reasons, I speculate (and do not claim greater certainty) that it is only a relatively small percentage.' His first two reasons are that obvious rational incoherences are rather rare, and that experts in courtrooms are often well practised at giving expert testimony (cf. p. 138). As Brewer points out in relation to this latter point, it 'would not take long for word to get out to the trial bar about experts whose testimony has been so unartful as to appear to a nonexpert, nonobscurely, insufficient

to satisfy general canons of rational evidentiary support. Indeed, one would hope that someone "qualified as an expert" by a court would know enough about the substance of her field not to render such testimony' (p. 138). Brewer's third reason for assuming that the percentage in question is rather small is that in most cases in which statements put forward by experts are rationally incoherent, it is not obvious to the untrained observer that this is so; some kind of training in the respective science would be required in order to spot the incoherence. On the basis of these considerations, Brewer concludes that the option of paying attention to rational incoherences in order to choose between two or more experts is no solution to our dilemma.

The next option he discusses consists mainly in evaluating the expert's demeanour in the courtroom. Brewer stresses that 'assessment of demeanor is unlikely to be accurate enough *in general* to provide a basis for an explanation of how a nonexpert can acquire KJB [knowledge or justified belief] from an expert' (p. 139). The reasons are simple and quite obvious: First, from the fact that someone *seems* to be competent it does not necessarily follow that he or she really *is*. Second, because it is widely known that expert-witnesses can be judged by their demeanour, many experts act accordingly. And that very fact makes it even more difficult to take a convincing demeanour as an indicator of expertise.

The fourth option Brewer gives for untrained judges and jurors to decide which expert they should believe is the evaluation of credentials. This option is perhaps the most promising of the four. He assumes that 'the epistemic device of credentials is coupled to that of demeanor, and that the non-expert who uses demeanor "evidence" is a fairly accurate judge of when the expert is being sincere. The simple reason for these related assumptions is that if indiscernible prevarication were a habit among experts, credentialism alone would be incapable of generating KJB' (p. 141). Although the idea of relying on credentials possesses a high *prima facie* plausibility, it immediately raises questions around what should count as credentials in the relevant sense. Would it be a PhD, or perhaps many publications? It is likely, for instance, that judges and jurors would prefer a scientist with a PhD from Harvard over a scientist with a PhD from the University of California. Only if they had some training in the discipline in question would they know which universities were best in that discipline and which were less well regarded. Brewer also points out that the idea of making a list specifying the credentials in question is also a dead-end: for who would be qualified to make such a list? Presumably we would need some kind of meta-expert, which certainly would do nothing to solve our problem, but would rather lead into a regress: how should we then decide who qualifies as a meta-expert, and who not?

Another, and surely related, problem for the option of relying on credentials arises in asking experts whether some kind of knowledge is or is not scientific. Should we ask the proponents of a given thesis, or its opponents? Brewer refers to a case in which a courtroom had to decide whether creationism was a science or not. He asks us to consider the following question: 'assuming that the judge was not an expert on science . . ., whom should he have asked about the identity of the appropriate scientific expert on whether creation science is real science—a creation scientist or a Darwinian? Either answer begs the question' (p. 144). Besides, if the jury hears contradictory testimony from two experts with apparently equivalent credentials, they will have no means of deciding which testimony they should prefer. Credentials may give

us a hint at the expertise of scientists. In many cases, however, credentials can be misleading or non-decisive. Having thus rejected this fourth option for untrained judges and jurors to decide which expert they should trust, Brewer claims that a solution to the initial dilemma requires that 'one and the same legal decision maker wear two hats, the hat of epistemic competence and the hat of practical legitimacy. That is, whether it is a scientifically trained judge or juror or agency administrator, the same person who has legal authority must also have epistemic competence in relevant scientific disciplines' (p. 1 49).

So far I have presented Brewer's arguments against the way untrained judges and jurors customarily choose between experts and their testimonies. But the courtroom can also be seen as symbolic of the fundamental role experts take in society more generally. On the one hand, they are indispensable. It is hard to see how we could live the lives we live without relying on experts. On the other hand, it is also hard to explain exactly why we should trust experts, and how we should distinguish real experts from those who only pretend to be experts. Besides, one has to wonder why a democratic system prefers to act according to the testimony of a select few people and gives no weight to what the layperson would have to say on the same topic. How is this compatible with the basic ideals of democracy?

Expertise is a topic of relevance to the empirical sciences, the social sciences and also to philosophy. It is a topic that is ripe for interdisciplinary investigation. It is a topic that could not be more pressing. And yet it is, at the same time, a topic that could not be more neglected by philosophers. It is therefore much to be hoped that Selinger and Crease's collection *The Philosophy of Expertise* will catalyse the philosophical debate on expertise. It is certainly very well suited to do so.

NOTES

1. There has been an extensive debate on expertise in psychology for several decades. In order to get an impression of this still ongoing discussion, one has only to leaf through the recently published collection, A. Ericsson: *The Cambridge Handbook of Expertise and Expert Performance*; 2006, Cambridge/ New York, NY, Cambridge University Press.
2. This is one of the questions Stephen Turner considers in his article 'What is the problem with experts?', originally published in *Social Studies of Science*, 2001, **31**, 123–149, and reprinted in Selinger and Crease's book.

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