Science, Religion and Truth

John Taylor

Summary

In this paper, the realist and relativist accounts of the nature of truth are outlined. The debate between realist and relativist interpretations of science is examined in the context of the influential work of Thomas Kuhn on scientific paradigms and revolutions. A realist account of science is defended. The question of whether objective truth can be defended as an ideal in a domain such as that of religious belief is addressed. A central objection to the relativist's position is that the nature of disagreement about religious belief can only be understood in terms of objective truth. This opens the way for a realist interpretation of that part of religion which concerns itself with the attempt to offer a fundamental explanation for features of reality.

Puzzles about Truth

Aristotle held that truth is a matter of agreement between what we say on the one hand and how things really are on the other. If P is the proposition 'there are mountains on the far side of the moon', then P is true if, and only if, there are mountains on the far side of the moon. On this view, the truth of a proposition like P has an objective character: it depends upon how things really are. It is up to you whether or not you believe that there are mountains on the far side of the moon – but it is not up to you whether or not that belief is true. The truth of P does not depend upon whether you, I, or even the entire human race believes that P; it depends on how things lie on the far side of the moon.

According to the pre-Socratic philosopher Protagoras, however, truth is not objective; it depends upon human beings. An example to illustrate the Protagorean account would be statements about sensations. Suppose that you have just arrived in the UK from the Bahamas, whilst I have arrived from Norway. For me, the UK feels warm, whilst for you, it is distinctly chilly. There is no single, objective truth, Protagoras would say, about how warm it is in the UK. Different human beings will experience temperature in different ways, and there is nothing more to be said about the matter. Protagoras, then, is the ancestor of all those who wish to assert that truth is relative – that there is no 'truth' as such, merely 'my truth' and 'your truth'.

A reply to the Protagorean relativist would be to note that, whilst there might be situations (as with sensations) when it is inappropriate to talk about objective correctness, nevertheless, in a great many cases we do have standards to which we can appeal in order to make objective judgements. A thermometer, correctly used, furnishes us with an objective means of settling disputes such as: is it warmer in the UK or in the Bahamas?

The Protagorean might challenge us to say what makes the choice of a thermometer 'the correct way' of measuring temperature, but there would be plenty to be said to back up the claim that there is an objective difference between warmer and cooler things. The measuring system which incorporates a thermometer ties in with other readily observable facts, such as that metals expand when heated, as well as with other facts about changes of state such as freezing and boiling.

A preliminary verdict, then, on the debate between objective and relative accounts of truth, is that there do seem to be cases where we can point to objective standards for determining truth. It is the question of standards which is at the very heart of the issue. What the relativist claims is that, on significant questions such as the truth of religious beliefs, or even during particularly deep disagreements about science, we lack standards to appeal to when engaged in disputes about where the truth lies. Instead of engaging in a necessarily futile squabble about absolutes, it is more appropriate to acquiesce in the language of relative truth.

We will examine the relativist's challenge in two settings, namely, an argument against the possibility of objectivity in science, and a discussion of whether objective truth is an appropriate goal for religious beliefs.

About the Author

Dr John Taylor is Head of Philosophy at Rugby School. Formerly a tutor in Philosophy at Oxford University, he has been extensively involved in the promotion of philosophical approaches to education, in particular through the medium of project work. He initiated the 'Perspectives on Science' AS level course in the history and philosophy of science. Amongst other writings on education, his book *Think Again: A Philosophical Approach to Teaching* (Bloomsbury Education, 2012) explores how teachers can include philosophical perspectives at all points of the curriculum.

The Spread of Relativism

As we have seen from a brief discussion of Protagoras, scepticism about the possibility of objective truth has a history as long as the history of human thought; the mode of thought nowadays called 'post-modern' has its roots in the pre-Socratic era. What is interesting is to see how particular epochs, such as our own, provide more nourishment for the growth of the relativist variety of thought.

The tendency for a relativist account of truth, once planted, to spread over the whole garden of ideas, is borne out by the attempt to exhibit even such an apparent bastion of objectivity as the natural sciences as a human endeavour, shot through with subjective elements. Relativism about science may seem highly counter-intuitive. But the influential work of Thomas Kuhn entitled *The Structure of Scientific Revolutions* and, following Kuhn, an entire school of sociologists of science, has led to just this conclusion.[1]

One might well think that our best-confirmed scientific theories would provide an unquestionable instance of objective truth. What more could be asked for, but that a theory, having been subjected to precise, detailed, extensive testing by both its proponents and its opponents over an extended period of time, should pass those tests, and also, as a result of further theoretical articulation, prove to cohere with other well-tested theories? Yet it has been argued by Kuhn and others that even our best-established scientific paradigms can come to be called into question; that the idea of comparing paradigms with reality is highly problematic and that we therefore are obliged to revise our picture of science as an enterprise in which there is progress towards objective truth. Some have even called for a new picture in which objectivity, rationality and truth play no part in explaining the nature of science; scientific activity is to be explained purely by reference to extrinsic, sociological factors.

A defence, therefore, of objective truth as the goal of science is in order. We will see that the critics of scientific rationality and objectivity can be answered by pointing to something inherent in the enterprise of science, namely a commitment to rationality which transcends commitment to particular paradigms. A framework of values unites scientists, even when they adhere to different paradigms. These values can be seen to derive from a primary goal of science, namely the search for theories which provide the best explanation for the available data. Since these 'explanatory virtues' derive from the nature of scientific explanation per se, and not from any particular scientific paradigm, they offer a framework within which rational discussion of the merits of rival paradigms can take place.

It is along these lines that a defence of a 'scientific realist' philosophy of science can be mounted. realism is the view that the goal of science is to provide an objectively correct account of reality and that the success of science, seen in the creation of theories of ever-increasing explanatory power, is evidence that progress is being achieved towards that goal. Note that the realist is not committed to the belief that we have attained final, unchangeable truths; the emphasis is on progress towards a correct account, and on the value of defending objective truth as a regulatory ideal; it is that to which scientists aspire in their enquiries.

[1] Kuhn, T. *The Structure of Scientific Revolutions, 2nd edn.,* Chicago: Chicago University Press (1970).

The difficulty for the relativist is that the very phenomenon which motivates their position turns out to be hard to explain in relativist terms.

If, as we will see, scientific realism can stand up well against its relativist critics, the question is raised as to whether realism might be defensible as an account of other discourses. On the face of it, the relativist attack on the idea of truth in matters of religious belief might seem harder to counter. For, unlike in the scientific case, there is within religious discourse widespread and seemingly intractable disagreement, not just about which system of religious belief is true, but even about the appropriate way in which to conduct discussions between rival religious positions.

There are those who say that religious faith rests on rational foundations and ought to be defended by an appeal to reason; more commonly, it is said that religious commitment is a matter of faith which goes beyond anything which can be rationally grounded by appeal to evidence or argument. There is a contrast here with the scientific enterprise, which is characterised by intense arguments about the merits of particular theories, but nonetheless displays considerable agreement about methodology.

This may seem to lend credibility to the relativist's claim that it is inappropriate to think in terms of objectivity and rationality when considering beliefs from the religious domain. Here, it is said, we have to do with the clash of differing subjectivities; with world-views which are adhered to for personal reasons and which are best assessed in terms of their value to the individuals concerned. Objective truth in such matters is out of the question; if belief in God's existence 'works for you', we may as well say that it is true for you.

We shall see, however, that a relativist account of belief is not beyond criticism. The difficulty for the relativist is that the very phenomenon which motivates their position – namely the existence of widespread disagreement – turns out to be hard to explain in relativist terms. If we each have our own truth, it follows that disagreement is not possible; but that seems to contradict the premise from which the relativist's argument began. It may turn out to be harder than the relativist imagines to dispense with objective truth as the standard for belief.

We turn first to the question of objectivity within science, and to an attempt to articulate an alternative to the traditional picture of scientific progress as a cumulative, steady journey towards an objectively true picture of the world.

Kuhnian Paradigms

Thomas Kuhn's account of scientific revolutions has had a profound effect on the history and philosophy of science. Kuhn drew attention to the fact that science is a human activity. He addressed himself to science as an institution. During normal scientific enquiry, scientists operate under the guidance of a paradigm. At its simplest, a paradigm can be seen as the central theory within a branch of science; Newtonian mechanics, for example, served as the dominant paradigm for physics for over 200 years. But the term has a wider application, in which it covers not simply theories but also examples of how to solve problems, methodological rules and even philosophical principles.

Newtonian physics embodies a commitment to determinism, for example. In general, we can see a paradigm as a disciplinary matrix: it is what binds a group of scientists together. There is therefore a link to ideas about identity. We describe scientists in terms of their paradigms. You are not simply a physicist, but a 'relativistic cosmologist' say; or, within the biological sciences, you may identify yourself as an 'evolutionary geneticist' and so on.

A paradigm provides the scientist with a model for their work. Physicists up until the turn of the twentieth century looked back to Newtonian mechanics and sought to extend this paradigm. Unsolved puzzles were to be addressed using the same methods Newton had employed. Yet from time to time, scientists find puzzles which resist solution by the methods countenanced by the dominant paradigm. These anomalies may prove particularly recalcitrant, drawing attention from leading workers in the field, and calling the legitimacy of the paradigm into question. The agreement which characterises normal science comes under threat, as various different modifications, or relaxations, of the rules enshrined in the paradigm are proposed. This is precisely the situation that obtained in 1900 as physicists struggled to come to terms with results which seemed incompatible with Newtonian mechanics.

At times of crisis in a discipline, a new paradigm may be articulated which claims to resolve the anomalies in the existing paradigm as well as offering the promise of a fertile new approach. If a sufficiently large number of scientists are disaffected with the existing paradigm, they may transfer allegiance to the new one – a process Kuhn calls a scientific revolution.

In speaking of revolutions, Kuhn uses a political metaphor to describe the process of paradigm choice. Political revolutions occur in a context of deep dissatisfaction with existing structures. The very institutions within which normal political debate and decision take place are themselves called into question, so that revolution tends to be a deeply disturbing, violent affair, in which the direction of future political activity is determined, not by any process of rational political debate, but rather by such factors as which side can muster most force.

Kuhn suggests that there is a comparable breakdown of rational discourse during scientific revolutions. It is the role of the paradigm under which a scientist works to provide guidance in the process of theory choice – to offer methodological guidance for the activity of puzzle solving. But if it is the paradigm itself which normally guides the scientist, to what can the scientist appeal when seeking to rationalise a choice of paradigm? It looks as though we face a problem of circularity: a scientist's conception of what makes for a good theory is so determined by the paradigm into which he or she has been inculcated that any attempt at rational debate will find both sides arguing in a question-begging manner.[2]

Incommensurability

Kuhn uses the term 'incommensurability' to describe the difficulty in comparing paradigms. One source of this difficulty is connected to considerations about meaning. Scientists operating in different paradigms do not even mean the same when they use particular bits of scientific terminology, he argued, so that mutual comprehension between scientists operating within different paradigms is under threat. Since the meanings of theoretical terms vary from one paradigm to the next, there is no neutral way of holding a discussion about the value of rival paradigms. Therefore there is no possibility of defending a verdict as to the objective correctness of a particular paradigm.

The incommensurability thesis is the reason many who encounter *The Structure of Scientific Revolutions* for the first time see it as a primer for relativism. It is hard to overstate the significance of Kuhn's arguments, which seem to show that in science, of all places, the scope for objective, rational enquiry is seriously restricted. If the tides of relativism rise to a level at which scientific objectivity is seen to erode, what hope is there for rational enquiry in other, seemingly more subjective disciplines? Part of the reason for the enthusiastic reception of *The Structure of Scientific Revolutions* by workers in the social sciences is that Kuhn's arguments were hailed as leading to a greater parity of esteem. Lack of objectivity ceases to be a criticism of the social sciences if in fact all of what we call scientific knowledge is subjective.

Rationality regained

Kuhn himself was disturbed by the relativistic conclusions others drew from his work. In a significant postscript to later editions of *The Structure of Scientific Revolutions* he sought to clarify the meaning of certain crucial claims, especially those surrounding the notion of incommensurability. He made clear that it was not his intention to attack the idea of the rational comparison of paradigms. He did, however, wish to draw out the point that such comparison is not a straightforward matter. There are reasons why disputes during scientific revolutions are not susceptible to easy resolution. There is no rule-governed decision procedure available to the scientist faced with a choice between paradigms. There are, however, a number of *theoretical virtues* – attractive characteristics of theories – which do provide the basis for rational comparison, since they are constitutive of science itself, and not merely dependent on one particular scientific paradigm. The theoretical virtues Kuhn lists are accuracy, scope, simplicity and fruitfulness. Rational discussion between adherents of different paradigms is possible because scientists on both sides agree about what it is that they are looking for: the theory which provides the best (most accurate, comprehensive, simple and fruitful) account of the data. There will, of course, remain plenty to argue over (what is meant by 'simplicity'; what is to be done if one theory wins on one count but loses on another). But at the very least, a framework for rational deliberation is in place.

Kuhn also clarified his position on the change in meaning of theoretical terms during paradigm shifts. He denied, for example, that there is a complete breakdown of communication during scientific revolutions. Incommensurability does not mean that scientists adopting a particular paradigm cannot make any sense of those working within a different paradigm. The point is simply that, since the meaning of central theoretical terms may vary from paradigm to paradigm, there will be *difficulties* of communication. Clarity may be lost in translation. But translation, Kuhn thinks, is possible. Learning to think in terms of a new paradigm is exactly like learning a new language. One's mother tongue comes naturally; a second language has to be learned, and translation into the new language takes effort.

[2] Kuhn *op. cit.*, p. 108.

Consider Kuhn's own example of the change in meaning of the term 'mass' in the transition from the Newtonian to the relativistic paradigm. The classically trained physicist has to work at getting a grasp on the way the term figures in special relativity. In Newtonian terms, a particle has a mass which does not vary with velocity. This is no longer the case in Einstein's theory, where mass is relativised to velocity. With the paradigm shift comes also an extension of the concept, through the introduction of new forms, such as 'rest-mass', or 'mass-energy'. Similar transitions have occurred in biology in the understanding of terms such as 'heritability' and 'epigenetics'. The definitions of these new terms have to be learned. That means that some work needs to be done to get used to the new way of speaking. But it does not mean that there is an unbridgeable semantic gulf between the classical and modern theories.

From Science to Religion

We have seen that Kuhn's account of paradigm shifts in science, whilst initially lending support to a relativist interpretation of theory choice, can in fact be well-explained in terms more congenial to the scientific realist. Rational choice between paradigms is a possibility, provided that scientists concur in allowing their deliberations to be informed by the virtues of accuracy, scope, simplicity and fruitfulness. In terms of ontology, nothing that Kuhn says implies that we cannot think in terms of paradigms as tools for managing our transactions with an objective reality. Indeed, the interpretation of paradigms as ways of thinking about reality, rather than as frameworks which determine reality, seems to have the merit of greater clarity.

All this suggests a conclusion about science which accords with common sense, namely that it is an activity which aims at objective truth, and in which there can be rational grounds for the decisions scientists make, even during times of deep-seated disagreement.

What, however, of religious belief? What makes relativism instinctively appealing to some, when matters of religion (or ethics) are on the table, is that there seems to be no way of decisively resolving the perennial disputes concerning questions such as the existence or nature of God. In these disputes, neither side seems capable of producing evidence or arguments which demonstrably settle the question. This may seem to support scepticism about the existence of objectively true answers in cases like this. The same point would hold for debates about certain historical claims, where, by dint of the passage of time, the possibility of ever laying hold on decisive evidence becomes more and more remote.

Paradoxically, though, the very fact that disagreement exists proves hard to explain in relativist terms. Consider the logical structure of disagreement. To return to the example with which we began, suppose that you and I have an argument about whether there are mountains on the far side of the moon. The subject of our disagreement is the proposition (call it P) that there are mountains on the far side of the moon. You say that P is true; I say that P is false. What we are disagreeing about – the subject of our dispute – is truth: in this question, the truth of the proposition P.

To make sense of the nature of disagreement, we have to invoke the notion of truth. Clearly, the truth in question is objective truth, not merely 'my truth' or 'your truth'. If we expressed the situation in terms of relative truth, there wouldn't be any disagreement. I do not contradict your saying that P is true for you by saying that it is false for me, any more than I contradict your saying that 'I am warm' is true for you by saying that 'I am warm' is false for me. Since, then, we can only understand the structure of disagreement as disagreement about (non-relative) truth, and since there undoubtedly is disagreement, relativism must be false.

An assumption in this argument is that both sides of the dispute acknowledge that a common system of rules – broadly, the laws of logic and the canons of empirical testability – is applicable to what is being said. It is this idea of a common framework within which the disagreement takes place which the relativist will wish to question. Yet it is not implausible to see science, religion and philosophy as consisting, in part at least, of activities which fall within the same general category, namely as attempts to explain the world.

Relying on reason

What unites science, religion, and philosophy at a very general level is that all aim to address our desire for explanation; for an understanding of the world we find ourselves in, of our own nature and of how we ought to live. True, these systems aim to provide different modes of understanding, but there is a commonality of aim at a general level and, in certain respects, commonality in methodology. A commitment to the application of reason in pursuit of objective truth is integral to any approach which seeks to satisfy our desire for explanation. This tells against what the relativist wishes us to think: that the different systems of, say, science and religion belong to incommensurably different worlds.

Relativism is sometimes advanced as part of a moral agenda: belief in absolute truth is necessarily linked to intolerance. Yet if the relativist's position carries with it the implication that rational discussion between competing positions in science or religion is impossible, what should be put in its place as a means for managing the very real conflicts over such matters? If rational considerations aren't in order, we seem to be left having to deploy coercive, or at least, propagandising, methods for seeking to deal with differences of belief. The relativist may wish that we simply live and let live – but the depth and seriousness of the disagreements makes that an untenable proposal. Better, we may think, to keep faith with reason.

The Faraday Papers

The Faraday Papers are published by the Faraday Institute for Science and Religion, St Edmund's College, Cambridge, CB3 0BN, UK, a charitable organisation for education and research (www.faraday-institute.org). The opinions expressed are those of authors and do not necessarily represent the views of the Institute. The Faraday Papers address a broad range of topics related to the interactions between science and religion. A full list of current Faraday Papers can be viewed at www.faraday-institute.org from where free copies can be down-loaded in pdf format. Print copies like this one can also be obtained in bulk quantities of ten or more at £1.50 per 10 copies + postage. Secure on-line ordering details are at www.faraday-institute.org.

Publication date: November 2014.