

Knowledge Falsely So-called: The Theological Case Against Scientific Realism

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Since the "Enlightenment," anti-theistic polemicists have characteristically leaned to science to deliver their challenge against faith. In both popular culture and scholarly circles, the spirit of Voltaire lives on, reassuring the faithful that science and religion apply to different and incommensurable spheres of knowledge, and then mocking the believer for treating their sacred texts as trustworthy in philosophical and scientific matters. An example of this approach is found in A. D. White's *The History of the Warfare of Science with Theology*. White's book seems to agree with the contemporary affirmation that Christians have the epistemic right to believe what they wish; however, so long as they understand the Biblical narratives in a general straightforward manner, they ought not to claim or vainly pretend that they hold justified and true beliefs since they conflict with well-established scientific claims. Such restrictions derive from the notion of science as the paradigm of rationality.

A theological response [1] to this challenge is two-fold. Considering the first response (part 1), it is important to note that those making the above claims, or claims similar to them, adopt a philosophy of science, commonly called "scientific realism," which ascribes to science the accurate portrayal of the natural world as it *actually* is. The work of Thomas Kuhn and the historical account of science show that science ("scientific realism") is unable to provide a true (or even approximately true) account of the natural world- for the simple reason that it is inherently impotent to do so. The second response (part 2) is the philosophical and biblical/theological claim that the Christian faith, as described in Scripture, provides the necessary preconditions for the intelligibility of the scientific enterprise. In other words, without the theological and philosophical views of the Bible, the scientific discipline is at best arbitrary and at worse undermined. The non-theological scientist obviously does do science, but that scientist can not give account for the very science being done. This second response will require both a philosophical and a biblical/theological description of the Christian worldview and the assistance of David Hume and Bertrand Russell to argue for the necessity of the Christian worldview for science.

Scientific Realism

Historically, scientists have maintained an important distinction between the theory one might propose and the observational evidence that might count either in favor of the theory (verification) or against the theory (falsification). This observation-theory distinction, the hallmark of "scientific objectivity," has fallen on hard times since the publication of Thomas Kuhn's *The Structure of Scientific Revolutions*. Kuhn argues that one can not observe data in an epistemological vacuum. In other words, the claim that one is neutral in regard to "facts" is a myth. Nietzsche called this "the myth of the immaculate perception." All "facts" are theory-laden. That is, the very process of selecting certain data (and not others) for scientific investigation betrays a whole host of metaphysical, ethical, and epistemological pre-commitments collectively known as a "paradigm." Kuhn suggests that the "priority of the paradigm" directs one's thinking in interpreting the evidence for or against a theory. Scientists do not merely see objects and phenomena, but they see them as *something* in light of their respective paradigm. [2] Historical analysis of the way scientists have treated data seems to many philosophers of science at the very least to have blurred the line between theory and observation, a line whose existence is doubted by Kuhn. Moreover, Kuhn has offered the provocative suggestion that different paradigms are *incommensurable*, that they suggest their own epistemic virtues and differ on such questions *inherently* so that no neutral discrimination between them is possible in principle.

If Kuhn is correct, he has refuted "scientific realism" by making it impossible for scientists to adjudicate between theories without appealing to some extra-scientific criterion.

The historical record creates additional problems for the "scientific realist." J. P. Moreland notes that the history of science offers numerous examples of "empirically equivalent" theories. Moreland explains that the scientific realist makes at least two claims, an ontological one and an epistemological one. Moreland writes:

The ontological claim is that the theoretical entities referred to by the theory exist and the theory describes those entities in a true (or approximately true) way. The epistemological claim is that science is objectively rational in such a way that it is possible in principle to have good reasons for thinking one of a rival pair of theories to be more approximately true than others.

But the history of science shows a large number of theories that have been empirically equivalent for a long time (Copernicus versus Ptolemy) or that are empirically equivalent in principle (relative or relational theories of space versus absolutist, alternative geometries of space); that is, two or more rival theories entail all the same observational consequences. In this case the theories are undermined by the data; data cannot settle the issue between the rivals in question. In these cases, the rational realist cannot satisfy both his ontological and epistemological assumptions. If he/she agrees that one of the rivals is true and the other is false, then he/she must admit that there is no way to tell which is which. On the other hand, if he/she denies that one is true and one or false, he gives up realism altogether. [3]

Moreland anticipates the appeal to epistemic "virtues" the realist might enjoin to resolve the dilemma by pointing out the fact that some theories have these characteristics does not necessitate the veracity of the theory in question, only its usefulness. Also, different theories often possess different (but very significant) epistemic virtues, leaving in the end only a scientist's arbitrary preference to discern which virtues ought to obtain priority. In his *Analysis of Mind*, Bertrand Russell inadvertently offered the grandest example of empirically identical puzzles for the realist. Russell invites his reader to imagine that "the universe sprang into being five minutes ago, exactly as it then was, with a population that 'remembered,' and physical structures that 'recorded,' a wholly unreal past." [4] In such a case, all solutions that appeal to evidence merely beg a very large question. Malcolm Acock maintains that no one has yet proposed a satisfactory solution to this "trivial-but-maddening" enigma.

Adding problem upon problem, prominent anti-realist philosopher of science, Larry Laudan, has chronicled numerous theories of the past that scientists (generally) considered false for quite some time, theories the scientific community now holds to be true. [5] Also having combed the annals of the history of science, Laudan has collected a lengthy list of past successful theories that the scientific community presently considers to have been falsified. These theories often possessed various and significant epistemic virtues. That is, they provided a theoretical basis for making accurate predictions and for controlling the environment, proved fruitful for future research, and managed to convince the majority of scientists of their veracity. Yet, by contemporary standards, they contained entities that Laudan politely dubs "non-referring," meaning that they have no counterpart in the real world. These useful fictions included aether, phlogiston, mysterious "affinities," and others. [6] Laudan's parade of "unsuccessful-but-true" and "successful-but-false" theories greatly weakens the link between the success of a theory and its truth-value, thereby casting grave doubts upon the putative veracity of all currently successful scientific theories. In light of the history of science, then, what guarantee could one offer that today's scientific "truisms" will not fall by the way or that some obsolete hypothesis will not make a surprising comeback? However useful a theory might be, its success apparently can not serve to indicate either the epistemological status of its claims or whatever its ontology names real entities.

To the troublesome pedigree the history of science has bequeathed the scientific realist, one can add the argument that while realism entails a cumulative-refinement model of the advance of scientific knowledge, history tells of many examples of "revolutions" in science, episodes of one paradigm overthrowing and

replacing another. The abundance of such examples strains the credibility of the cumulative-refinement model. After citing several examples, Kuhn insists that

This need to change the meaning of established and familiar concepts is central to the revolutionary impact. Though subtler than the changes from geocentrism to heliocentrism, from phlogiston to oxygen, or from corpuscles to waves, the resulting conceptual transformation is no less decisively destructive of a previously established paradigm. Just because it did not involve the introduction of additional objects or concepts, the transition from Newtonian to Einsteinian mechanics illustrates with particular clarity the scientific revolution as a displacement of the conceptual network through which scientists view the world. [7]

Often times, in light of their many difficulties, realists opt for the weaker claim known as "approximate" realism or verisimilitude, the idea that successful theories only approximate the real world with varying degree of precision. Not only does this ad hoc modification fail to avoid many of the obstacles to a realism already noted, but it adds a few of its own. To begin with, just like "exact realism," the idea of approximation presupposes a correspondence theory of truth, a conception that has yet to attain an adequate definition. No one seems to know how it should appear when theory x "corresponds" to state of affairs y. Second, no matter the semantic trickery one may employ to cover up the fact, an "almost-true" theory remains a *false* theory, even when it works better than the *more false* (!) theory it supposedly refines. Consequently, it appears that arguing the weaker claim offers no aid to the realist cause.

Do the conceptual entities postulated by a theory actually refer to an entity in the real world, as realism mandates? It does not seem so. Moreland has noted that often times theoretical entities like specific gravity can be eliminated from a larger theoretical framework without affecting the meaning of scientific claims. [8] Perhaps, then, such concepts merely represent a kind of scientific shorthand, symbols that do not genuinely refer.

Moreland also makes the fascinating observation that, as philosophers of science, realism and anti-realism represent incommensurable second-order theories about science, meta-theories *which are themselves empirically equivalent*. [9] Therefore, one must invoke something other than mere data in order to choose between them. The present debate between eminent philosophers of science on both sides of the issues underscores this profound verity. If not by reference to the hard data science and the history of the sciences, how then ought one to decide whether or not scientific realism is indeed true?

What is the significance of the downfall of scientific realism? If anti-theistic polemicists are making claims against the faith which are grounded in a faulty understanding of science, those very claims can be discarded as antiquated and as no longer a challenge to the faith. If science is not merely data collection (scientific realism), how is science to be done? This question will be answered in the following section.

Christianity and the Necessary Preconditions for Science

The Christian can be confident in a discussion on the nature and use of science, precisely because the Christian theistic worldview can provide the necessary preconditions for the intelligibility of scientific inquiry. Although the suggestion that science requires a significant number of philosophical assumptions just to conduct empirical investigation may not be new, it has special import for the present evaluation. If one views science as a truth-obtaining enterprise, its "true" theories can not refute, either explicitly or by implication, the propositional foundations upon which science itself rests. Otherwise, these theories would undermine and invalidate science as a whole and themselves by inference. Unfortunately for the realist, his/her account of science falters under the weight of numerous internal contradictions. It should be remembered that non-theists do science (and usually do so very well), but they can not give an account for the very science they are doing without relying on the "borrowed capital" from the Christian worldview. The non-theistic scientist is able to avoid utter nihilism and skepticism in science only by being inconsistent with their own worldview and borrowing some elements of God's revelation. In order to demonstrate the veracity and implications of this claim, it is first necessary to describe and discuss briefly

some of the most important presuppositions without which scientific investigation should prove impossible. A brief list of such presuppositions includes : [10]

1. *The uniformity of nature*: the laws, properties, or characteristics of objects and phenomena of a particular class do not vary over distance or time. Nature should be regarded as uniform.
2. *Induction*: since nature is considered uniform, one may, from a limited number of objects/phenomena of a class, properly induce generalizations about all objects/phenomena of that same class.
3. *Ontological/epistemological realism*: nature has an objective existence as an interdependent system, and is both intelligible and accessible to the human intellect.
4. *Mathematical realism*: nature can be described accurately by the use of mathematics.
5. *Methodological, epistemic, and ethical values*: examples of these would be the common claims that some methods constitute good science, others bad or pseudo- science; good theories have certain characteristics; and scientists ought to report accurately and honestly.
6. *The reliability of the human mind and sensory faculties*: the human mind and senses "fit" the natural world, and the use of the laws of logic aids discovery of truth and tends to falsify error.
7. *Ontological/conceptual categories*: observed phenomena and entities are defined a priori by known classes such as objects, facts, events, etc. and are construed in a scientific tradition as planets, waves, species, etc.
8. *The usefulness/adequacy of human language to describe nature*: nature corresponds to the mind in such a way that human language closely "fits" nature.
9. *The existence of singularities, ultimate boundary conditions, and brute givens*: certain features/constants of the cosmos are simply taken for granted (eg. the mass of a proton, some values for forces, free acts of moral agents, etc.).

The claim being made is that the Christian theistic description of the world offers these presuppositions. The philosophical preconditions for science are in the pages of the Hebrew and Greek scriptures. According to Scripture, God is the transcendent and almighty Creator of heaven and earth, and everything owes its very existence and character to God's creative powers and definition (Genesis 1; Neh. 9:6; Col. 1:16-17). God makes particulars in creation the way they are and determines that they will function as they do. According to Psalm 147: 5, "God's understanding is infinite." Ephesians 1:11 declares that God sovereignly governs every event that transpires, determining what, where, when, and how anything takes place. This includes the motion of the planets to the molecular world to the death of a sparrow. Isaiah 40:12. 22- 28 celebrates the power, creation, providence, delineating, and directing of Yahweh. God has the freedom and control over the created order as the potter has over the clay (Romans 9:21). Moreover, knowledge is possible because of a corresponding capacity created in us by God.

The anti-theist worldview can not account for the uniformity of nature on which to base the scientific process. David Hume has taught us that to say the future will be like the past is to beg the question. [11] Since the uniformity of nature is an unjustified assumption in the atheistic worldview, there is no basis upon which to engage in scientific activities. Bertrand Russell succinctly states the problem of assuming the uniformity of nature in *The Problems of Philosophy*:

The problem we have to discuss is whether there is any reason for believing in what is called 'the uniformity of nature'. The belief in the uniformity of nature is the belief that everything that has happened or will happen is an instance of some general law to which there are no exceptions...But

science habitually assumes, at least as a working hypothesis, that general rules which have exceptions can be replaced by general rules which have no exceptions...Have we any reason, assuming that they (scientific laws) have always held in the past, to suppose that they (scientific laws) will hold in the future. [12]

The problem is that without a basis for the uniformity of nature there is no basis for induction. Russell continues that the business of science is to find uniformities, such as the law of gravitation and the laws of motion. Is it possible to formulate general laws of science in a world with no basis for the uniformity of nature? Russell answers this in the negative by writing the following:

Experience might conceivably confirm the inductive principle as regards the cases that have been already examined; but as regards unexamined cases, it is the inductive principle alone that can justify any inference from what has been examined to what has not been examined. All arguments which, on the basis of experience, argue as to the future or the unexperienced parts of the past or present, assume the inductive principle; hence we can never use experience to prove the inductive principle *without begging the question*. Then we must either accept the inductive principle on the ground of its intrinsic evidence, or forgo all justification of our expectation about the future. [13]

The Christian is not left with such a problem, precisely because the uniformity of nature and induction are compatible with the Christian "picture" of the world. God, who is providentially in control of all events, has revealed to humans that we can count on regularities in the natural world. Because of this regularity, the endeavors of science will be fruitful. Science would be impossible without the truth of the Christian view.

Conclusion

Realism entails at least the idea that many of its scientific models name theoretical entities that have actual counterparts in the objective world; that is, some models genuinely refer. The theories regarded as "most successful" (and thus most likely to refer) are those that can account for much empirical data, and, more importantly for the matter at hand, those that prove capable of making accurate predictions. I have already noted some difficulties of using empirical data as the test for veracity, but what of predictive accuracy? As impressive as a model's ability to make accurate predictions may seem at first glance, however, the question of whether this ability establishes the positive truth-value of the model remains. In 1611, one of Galileo's more famous opponents, Robert Bellarmine, pointed out that any evidence accrued to support the Copernican model would necessarily adopt the following form of argument: If A is true, then we shall find B. We have found B, therefore A must be true. The fallacious nature of this kind of argument is called the fallacy of affirming the consequent. No scientific model can stake the truth-status of its antecedent claims upon its predictive accuracy without affirming the consequent. Bellarmine's sound argument has not been taken seriously by realists. Dr. Lauden writes:

It is little short of remarkable that realists would imagine that their critics would find the argument for realism compelling. Ever since antiquity critics of epistemic realism have based their scepticism on deep-rooted conviction that the fallacy of affirming the consequent is indeed fallacious. When Bellarmine or Hume doubted that certain theories which saved the phenomena were warrantable as true, their doubts were based on a belief that the exhibition that a theory had some true consequences left entirely open the truth-status of the theory. Indeed, many non-realists have been non-realists precisely because they believed that false theories, as well as true ones, could have true consequences. [14]

Although I should wish to concede that it is possible, or even likely, that, given the fact that realism commends so numerous and talented disciples, they may in time surmount some of the obstacles to realism mentioned herein; but the prospect that they might overcome all of them, given the apparently insuperable nature of several of them, seems but dimly remote. And until the critic of Christianity who wishes to levy against it some scientific claim or other can produce some respectable answers of their own to ground their

presuppositions, they remain a proverbial paper tiger, a skeptic full of sound and fury, signifying nothing—save their own inability to justify the knowledge claims they need to discredit religious belief.

Endnotes

- [1] This will be a Christian theistic response, since that is the view of the author. But I believe this argument is relevant for Judaism and Islam.
- [2] Thomas S. Kuhn, *The Structure of Scientific Revolutions* (Chicago: University of Chicago Press, 1970), pp. 55-65.
- [3] J. P. Moreland, *Christianity and the Nature of Science* (Grand Rapids: Baker Book House, 1989), pp. 153-154.
- [4] Malcolm Acock, "The Age of the Universe," *Philosophy of Science* 50 (2) 1983, pp. 130-145.
- [5] Larry Laudan, *Science and Values* (Berkeley: University of California Press, 1984), pp. 110-113.
- [6] *Ibid.*, pp. 114-127.
- [7] Kuhn, *The Structure of Scientific Revolutions*, p. 102.
- [8] Moreland, *Christianity and Nature of Science*, pp.160-165.
- [9] *Ibid.*, pp. 167-168.
- [10] *Ibid.*, *Christianity and the Nature of Science*, pp. 108-133.
- [11] See section IV in David Hume, *An Enquiry Concerning Human Understanding*.
- [12] Bertrand Russell, *The Problems of Philosophy* (Oxford University Press), pp. 63-64.
- [13] *Ibid.*, p. 68.
- [14] Larry Laudan, "A Confutation of Convergent Realism," *Philosophy of Science* 48:1 (March 1984), p. 45

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