ESSAYS ON SCIENCE AND SOCIETY

Being an Absolute Skeptic

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Scientists are understandably irritated when philosophers announce that, beyond the stark fact that it usually receives special attention, contemporary science has no special claim to attention. A prevalent anti-realist or relativist view (there are many variants) is that although science indeed offers an intriguing perspective on nature, it is one perspective among many; it is not an incorrect one, admittedly, but it is in no smart sense a correct one either—even to talk of correctness and incorrectness is to miss a deep philosophical insight. All that can be said, according to these relativist philosophers, is that science has been vastly successful in grabbing headlines, and that this success calls for sociological or political explanation. Faced with such detraction, scientists characteristically retort that science, unlike witchcraft, works.

For their part, philosophers may be hardly less nettled when scientists claim for science, and for scientific knowledge, an intellectual authority that for more than 250 years has been known to be logically untenable. I allude here only in passing to the doctrine that science has conclusive or unimpeachable authority. Few now think this. But what many defenders of science do think is that science verges on the indubitable. The results of science are not certain, it is agreed, but they come close; they are not irrevocably proved by observation and experiment—that asks too much—but they are overwhelmingly supported by observation and experiment. Scientific theories, it is maintained, are justified in a way that most other beliefs are not. Faced with such reverence, philosophers can only reiterate the skeptical argument of David Hume (1711–1776) to the effect that reports from the past provide not the slightest reason to suppose that any one thing rather than any other thing will occur in the future. Science offers no security. Science has no authority.

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Where the relativist who diminishes science and the justificationist who magnifies it are prone to agree is in supposing that skepticism and relativism come to much the same thing: that to deny that science is justified is to deny that it can tell the truth. This presumption that genuine truth is impossible, or insignificant, if it is not graced with a measure of justification, is displayed in the everyday remonstrance "You can't say that!" made to someone who has just said what allegedly cannot be said. It has been the most mischievous error in the theory of knowledge since Plato, this presumption that unjustified opinions are rationally worthless; and, apart from the blunderingly myopic conflation of science and technology, it is the principal source of most anti-scientific and anti-rationalist sentiment. In this essay I try to repair some of the damage by returning to the understanding of science described in essentials 65 years ago in Karl Popper's masterpiece *The Logic of Scientific Discovery*.* Popper's falsificationism, or critical rationalism—his theory of conjectures and refutations—is rightly celebrated for its repudiation of induction and for its illumination of the role of imagination in scientific work. What is less fully recognized is its success in combining hard-nosed skepticism with soberminded realism.

It is easy to see why the confusion of skepticism with relativism, or of justification with truth, is rationally so debilitating. On the one hand, those who are rightly impressed by Hume's argument that scientific theories and scientific predictions cannot be justified by experience, even in part, are led to conclude that experience plays only a psychological or rhetorical role. On the other hand, those who are rightly impressed with science's triumphs argue in the reverse direction, concluding that in some way—no one knows exactly how—Hume's argument must be fallacious; its skeptical conclusion can therefore safely be disregarded. In both cases the integrity of science as a rational undertaking is drastically compromised. Relativists depreciate reason, and replace it with rhetoric; anti-skeptics deprecate it, and resort to hubris.

Not all scientists are thoroughgoing realists, in particular where the interpretation of quantum mechanics is concerned; but few are relativists. Among philosophers too, relativism attracts only a minority, though a more plangent one. Critical rationalists, who embrace both realism and skepticism, constitute an even smaller minority. The commonest position combines forthright realism with an ambivalent justificationism that longs wistfully for the day when Hume's skeptical attack will be meticulously outflanked. But if you will allow some oversimplification in my depiction, today's crucial battle lines are drawn as I have drawn them: the realists, the stalwart defenders of science and of science's authority, ranged against the skeptics, the illuminati, the postmodernists.

This is precisely how the lines are drawn in a book that gained notoriety last year on a different score, *Intellectual Impostures*†

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* K. R. Popper, *The Logic of Scientific Discovery* (Basic Books, New York, 1959). Originally published as *Logik der Forschung* (Julius Springer Verlag, Vienna, 1934).
† A. Sokal and J. Bricmont, *Intellectual Impostures* (Profile, London, 1998).
‡ A. Sokal, "Transgressing the Boundaries: Toward a Transformative Hermeneutics of Quantum Gravity", *Social Text* 46–47, 217 (1996). Reprinted in Sokal and Bricmont (1998).
§ N. Koertge, Ed., *A House Built on Sand: Exposing Postmodernist Myths About Science* (Oxford University Press, NYk, 1999).
|| G. Taubes, *Bad Science: The Short Life and Hard Times of Cold Fusion* (Random House, NYrk, 1993).
¶ *The Guardian*, 23 February 1999, p. 17.

by the physicists Alan Sokal and Jean Bricmont. In 1996 Sokal enraged cultural theorists by planting in a leading periodical a spoof article[‡] that ridiculed the way in which some prominent French intellectuals of recent years have ornamented their writing with uncomprehending, and certainly incomprehensible, passages of bewitching scientific jargon, borrowed mainly from theoretical physics (quantum theory, chaos) and from pure mathematics (topology, mathematical logic). *Intellectual Impostures* sketches the background to Sokal's lampoon, unwisely explains many of the jokes, and seizes the opportunity to take a swipe at others, not only postmodernists, who seek to topple science from its pedestal of honor. Sokal and Bricmont are unsurprisingly scandalized by relativism. What they, along with the distinguished contributors to the brand-new collection *A House Built on Sand*,[§] unpardonably fail to grasp is that in their attitude towards skepticism it is the outrageous postmodernists who are right and the champions of science who are wrong.

Relativism amounts to the denial of an objective world about which true and false statements can be made; there is no absolute truth, though there may be many "relative truths". Skepticism in its simplest form denies only that we ever know, in the sense of *know for certain*, whether a statement that we make is absolutely true or false. We know nothing for certain, the ancient skeptics argued, because the grounds for what is known themselves need grounds, and we embark on an infinite regress of justification. To this traditional skepticism Hume made two striking supplements. He noted that reports of experience, of observation and experiment, do not conclusively justify any prediction concerning the future (or, more generally, the unobserved), even if they are held to be so solidly based as to need no justification themselves. This is skepticism about induction—the method that, Bacon had taught, warrants inference from the known into the unknown. Hume's second finding was that the same skeptical conclusion follows when we abandon the unattainable dream of conclusive justification and ask only that our opinions be supported or backed by experience, or made probable. Modern skeptics relish especially this second discovery of Hume's: that there exist no grounds whatever, conclusive or inconclusive, for anything that we know.

Without apparently noticing the lapse, Sokal and Bricmont slide from a quite proper dismissal of relativism into a brazen opposition to skepticism—"brazen" because, although they mention Hume several times, they make no effort to fault the logic of his argument. Like Bertrand Russell before them, they associate unflinching skepticism with insincerity (whereas Hume, a shrewder psychologist, realized that insincerity, or at least laziness, is the only remedy for skepticism). They summarize bluntly: "No statement about the real world can ever literally be *proven*; but . . . it can sometimes be proven beyond any *reasonable* doubt" (p. 57). Hume denied this. Sokal and Bricmont do not reveal where, in their judgment, his argument goes adrift.

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My own opinion is that Hume's argument is indeed open to question. (It would be inappropriate to enter into this delicate issue here.) This is not to concede that Hume's conclusion is not correct. It is correct. Skepticism is correct. This in its turn is not to concede anything to relativism. Absolute skepticism is correct. Nor does skepticism, as I have delineated it, recommend universal suspension of judgment, unless it is joined to the ruinous doctrine that all rational opinion is justified opinion. The level-headed skeptic, the critical rationalist, does not doubt that there is truth to be had, but thinks that it may be had only by making a lucky guess. If you judge that there is life elsewhere in the galaxy, and I judge the opposite, then one of us has hit on a fragment of the truth. That there are no grounds for thinking that I speak the truth, or that you do, does not imply that neither of us does.

Remorseless though the logic is, it is at this point that reasonable people dig their toes in. Can it be seriously maintained that present-day science is no more than a string of lucky (and unlucky) guesses, guesses that are no better than are those of ufology, dianetics, and similar unseemly bunkum? It is important to understand why this is not what is being maintained by critical rationalists. Scientific hypotheses are guesses, *yes*; these guesses are no better backed by observation and experiment, and have no more claim on our credulity, than have the (unrefuted) fancies of pseudoscientists, again *yes*. But science is more than the sum of its hypotheses, its observations, and its experiments. From the point of view of rationality, science is above all its method—essentially the critical method of searching for errors. It is the staunch devotion of science to this method that makes the difference. What is wrong with pseudoscience is the manner in which it handles its hypotheses, not normally the hypotheses themselves (though if they are designed to be unassailable and unfalsifiable, then unassailed and unfalsified they doubtless remain). But although a hypothesis that survives all criticism thrown at it is preferable to a hypothesis that dies, it does not become a better hypothesis through being tested. It may have been a better hypothesis from the outset, of course; it may be true. True hypotheses are what we seek.

It took Popper's genius to realize that what is central to rationality is criticism, not justification or proof; and to scientific rationality, empirical criticism. To rescue science as a rational enterprise, perhaps the rational enterprise *par excellence*, there is accordingly no need to attribute to well-tested scientific hypotheses a security or reliability that they do not possess. Scientific hypotheses are not trustworthy or reliable, except in the sense of being, in some instances, true; and they are not in any interesting respect based on experience.

Why does all this philosophy matter to practicing scientists? It matters in several ways. First, if scientists would stop overlauding scientific rationality in the face of reason, then there might be fewer disgruntled defections to irrationalism. Second, scientists might become less harsh on their colleagues who make interesting but false conjectures; science no doubt mixes ill with cupidity and other human weaknesses, but all told the cold fusion affair, for instance, was—despite the title of one account[‖]—rather a splendid example of the critical method hard at work. Third, scientists might show greater readiness to admit ignorance, a trait not always at the forefront in such episodes as the recent BSE (bovine spongiform encephalopathy) scare in Britain. Ignorance need be no more shameful than poverty or disease (though all are sometimes culpable). Fourth, public expectations of what can be accomplished in science might be moderated, so that we are spared such hilarious headlines as "They don't know, you know" (offered in a recent issue of *The Guardian*[¶] in the wake of public concern about genetically modified foods). And fifth, we might all learn to size up better the strengths and limitations of the scientific outlook. These gains would be no small reward for playing host to some of mankind's liveliest thoughts.