

Review of *Imperfect Oracle*

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In the Preface to this exploration of the relations between science and society, Ted Brown suggests that science exerts *less* influence than one might expect, given its central role in modern culture, and proposes to try to understand that state of affairs by examining the nature and origin of scientific authority (ix-x). The main text is divided into two sections, respectively titled “Foundations” and “Science in Society.” In the first, Brown outlines a categorization of various types and sources of authority, and traces the historical evolution of scientific authority from ancient Greece through modern times. The second section offers more detailed examinations of science’s interactions with four segments of contemporary (mostly American) society: the law, religion, government, and public affairs. A final chapter, “The Prospects for Scientific Authority,” draws these threads together, and offers some modest suggestions for improvement.

In both his historical survey and the individual topical studies, Brown provides concise but compelling accounts of where we are today, and how we got there. The material and its presentation are commendably informative, as well as entertaining. However, those looking for an overarching explanatory schema will soon realize — as Brown himself clearly does — how elusive that goal remains. Historically, the locus of scientific authority is presented as quite diachronic: while to a large degree there has been a gradual shift from individual scientists to a more institutionalized “science,” some individuals continue to hold on to a disproportionate share even today. More importantly, it is far from clear what determines, in any given situation, which scientists will be perceived as particularly authoritative. Brown cites the “fateful” example of Einstein’s letter to Roosevelt, calling for development of a nuclear weapon: although Einstein had no particular expertise in the field, he was able to get the president’s ear — which the true experts probably could not have done — because of his “enormous charismatic authority” (85). Whence comes such charismatic authority? Brown implies it was a combination of factors, unique to Einstein’s particular case. How then can we explain, much less predict, where authority will reside in any general circumstance?

One difficulty lies, at least in part, in the emphasis Brown places on the distinction between epistemic and moral authority — expressed concisely as “the capacity to convince others of how the world is” vs. “the capacity to convince others how the world should be” (23). In the first place, the difference is not so clearcut as Brown would have us believe. His discussion of Pasteur, which is featured prominently in the historical account, provides a good illustration (60-66). Having recognized the role of microorganisms in many diseases, Pasteur recommended that physicians follow sterile procedures; according to Brown, “By instructing the members of the august Academy as to what they *should* do in the course of surgical work, Pasteur was exercising *moral* authority” (63). But that seems debatable. I expect Pasteur would have believed that he was exercising *expert* authority, by trying to teach them what needed to be done to prevent disease. If his advice was not well received (as it was not), that would represent resistance to his claim of expertise, not his moral authority; the latter would be invoked

only if the question of whether disease should be prevented were at issue. Is this hairsplitting? Maybe a little. But surely the difficulty of determining whether and how moral authority follows from expert authority is exacerbated if the line between them cannot be clearly drawn.

A further complication is that the important distinction between *trying* to exercise moral authority and actually succeeding is not always kept clear. Brown speaks of moral authority as “the license to argue convincingly about how the world should be” (270). Who issues, or needs, such a license? Anybody is free to argue about anything; whether the argument is convincing depends at least as much — probably much more, in most cases — upon those at whom it is aimed. Brown mentions Linus Pauling among those whose scientific authority (recognized by the 1954 Chemistry Nobel Prize, among other honors) could be extended to the realm of public policy (22, 25, 91). However, his arguments against nuclear testing were (initially, at least) much more convincing to the Nobel Peace Prize Committee than to the US government and public — according to Wikipedia, a headline in *Life* magazine referred to his 1962 Nobel Peace Prize as “A Weird Insult from Norway” — while his efforts on behalf of Vitamin C, a topic much closer to his field of scientific expertise, ultimately proved fruitless.

It is also telling that we see much more of how scientific authority is challenged than of how it is accepted in all four of the chapters on social institutions, even though the institutions themselves operate very differently. Only in the case of science and religion are the two sides portrayed predominantly as natural adversaries, locked in a contest for authority; no such conflict seems to be inherent in the relationships between science and the law, government, or public interest. Indeed, much of the chapter on science and the law presents the legal and scientific establishments as natural partners, engaged in the largely *cooperative* efforts of defining the role of scientific expertise in the courts and dealing with the significant differences between the two domains. (Most important among the latter is, perhaps, the fact that in their respective quests for knowledge, the law relies *much* more heavily on procedural rules than does science.) But because legal proceedings are in and of themselves highly adversarial, in any particular case at issue claims of scientific authority will often meet resistance no less vigorous than in any science vs. religion dispute.

Much the same is true of the chapter on science and government: opposing parties (in the general sense of the word) will try to enlist or discredit scientific authority to further their position, with economic and political considerations playing a much larger role than any factors that could be considered internal to science. Brown’s discussion of the “ozone hole” controversy illustrates this beautifully (218-227). Molina and Rowland’s initial paper, claiming possible damage to the ozone layer by CFCs, appeared in 1974; its scientific merit was promptly challenged by (among others) DuPont, a major manufacturer. The first regulatory action was issued in 1977, by which time only a limited amount of additional scientific evidence had been accumulated. Nonetheless DuPont had already changed their position and backed regulation, in large part because they had taken the lead in developing and producing substitute refrigerants, and saw themselves as well placed to profit thereby.

One issue, which is considered at some length in the chapter on government, does not seem so inextricably linked to political or economic battles: the question of the autonomy of science. But here again there is a problem related to definition of terms: are we talking about autonomy as something that belongs to science as an institution, or to individual scientists? and to what degree do the demands of those two attributions come into conflict? Brown quotes Polanyi (“The Republic of Science” in KB, 59) as seemingly unconcerned by any potential conflict: “The authority of scientific standards is thus exercised for the very purpose of providing those guided by it with independent grounds for opposing it....Scientists exercise their authority over each other. Admittedly the body of scientists, as a whole, does uphold the authority of science over the lay public.” Brown suggests that, although the “elitist overtones” may sound out-of-date, the vision is still valid (104-106); but I’m not sure I would agree.

For example, in his lengthy consideration of the issue of climate change, Brown comments that “the exercise of expert authority depends on the perception of a scientific consensus. When there is an impression that scientists are in significant disagreement on a scientific issue, expert authority wanes” (232). The key question is: what counts as “significant” disagreement, and what does it take to create an impression thereof? Notably, in this controversy, it doesn’t seem to take very much! Those “climate change deniers” who contest the existence of a reliable scientific consensus are able to cite heterodox opinions to good effect; the relative numbers and reputations of the scientists on the opposing sides don’t appear to matter very much at all.

I suggest that this is a consequence of the existence of an *inherent* conflict between individual and institutional autonomy, which Polanyi and other have largely swept under the rug. Brown again cites Polanyi (104; a paraphrase this time): “Discoveries of the greatest ingenuity are often those that break with accepted communal beliefs. It is this balance, between the guiding role of professional standards and challenges to them, that imparts an authority to science.” But the public mostly sees only those individual scientists who make the ingenious discoveries. The communal beliefs, the professional standards and the balance are virtually invisible, in either the news media or popular representations of science in movies, TV, etc. It is perhaps not surprising, then, that heterodoxy is disproportionately accepted in contests of authority, or that the “balance” can, far from imparting authority, often tend to undermine it.

What, then, is to be done? Brown explicitly states that his aim is to be more descriptive than prescriptive, but he obviously feels (as noted above) that science *should* play a stronger role in society. His main suggestion is that we need better public understanding, not so much of the *content* of scientific discovery, but of how the scientific enterprise works: “a turn toward more personal presentations of science, including narratives that relate stories of scientists at all stages of their scientific development, will make science more approachable....A more personal approach that relies on narrative as well as logical argument establishes closer connections with nonscientists, and in doing so enhances science’s moral authority” (291-292). I strongly agree with that proposal. I would only delete the word “moral,” not only because of the

problematic definition discussed above. Improving public awareness of the *human* nature of scientific work, and the importance of an interdependent community as opposed to a small cadre of superstars, could be beneficial for all the ways, in all the arenas, that science and society come into contact.