

The Golem at Large: what you should know about technology

Harry Collins and Trevor Pinch

1998 Cambridge University Press 163pp

The Golem: what you should know about science (2nd edition)

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In 1993 a slim volume appeared, provocatively entitled "*The Golem: what everyone should know about science.*" Two leading sociologists of science, Harry Collins and Trevor Pinch, used seven case studies of scientific controversy in an effort to debunk the traditional account of science as a totally rational, methodological pursuit, and to redescribe it as an entirely human activity, metaphorically represented by the powerful but somewhat bumbling creature of Jewish legend known as the golem. Not surprisingly, the book proved at least as controversial as many of the cases it examined. Many scientists read it as a radical attack on the foundations of scientific knowledge, and it has played a significant role in the "Science Wars" which began to be visible about a year later.

Now Collins and Pinch have brought out a new book, in which they apply their ideas to technology. Among the cases examined are: evaluating the success of Patriot missiles against Scuds in the Gulf War of 1991; the ill-fated decision to launch *Challenger* on a cold January morning in 1986; and the regulations imposed by the British Ministry of Agriculture on sheepfarmers in response to radiocontamination following the Chernobyl disaster of 1986. Some present relatively unknown material, while others seek to shed new light on familiar stories. Prominent among the latter is the *Challenger* disaster. The subsequent inquiry is already virtually legend: a prominent scientist (Richard Feynman) sweeps in and demonstrates to all the confused engineers and politicians, by means of a straightforward lab-scale experiment, just where they went wrong. As recounted here, that picture is oversimplistic to the point of being misleading: those responsible for the launch decision were actually well aware of the potential effect of the cold weather on the O-ring seals. Their decision was based on balancing all the various positive and negative factors, including that one, as best they could — even though it turned out to be wrong.

While the list of topics does not tell us exactly what the authors mean by "technology" or how they distinguish it from "science," we get some clarification from the book's title. Technology is what happens when the scientific golem escapes from the laboratory and encounters society in general. As a consequence, scientists may well find this book much less threatening than its predecessor. It is tempting to conclude that these cases are controversial, not because the scientific issues can't be definitively settled, but because politics and other "extra-scientific" (i.e., human) factors complicate matters. Thus, for example, in the case of Patriot vs. Scud, no universally acceptable estimate of success could be reached, as the definition of what constitutes success would remain inextricably tied up with the interests of those making the assessment, even if we had "better" scientific data.

Collins and Pinch strongly resist such an interpretation. They argued in the original *Golem* that science is *not* independent of human factors, and here they try to show that the kinds of disputes that arise, and the manner in which they are settled (or not), look rather similar whether they are mostly confined within a laboratory setting or take place in a much broader societal context. Standing on its own, *The Golem at Large* is less than convincing on that score. Hence it is timely that a new edition of the first book has also just been published. Particularly welcome are the changes incorporated in this second edition (including the subtitle) that tone down some of the more infuriating statements of the original version, and the addition of an afterward in response to scientists who criticized them. The authors try to make it clear that they are addressing only controversial science and technology, and that they are not in any way trying to tear down the scientific enterprise.

What *are* they trying to do, then? They claim that a more realistic (i.e., theirs) understanding of how science and technology really function can only be beneficial, for both science and society at large. To adhere to the traditional view, that expects scientists to be able to produce a set of reliable findings that can be handed over to the public, is unreasonable and even dangerous. Why dangerous? Because when expectations of reliability are (inevitably) met with uncertain and tentative results, people tend to do a 180° turn, and decide that science is completely unreliable. The case of the farmers and their Chernobylized sheep illustrates such a development. Along with an account of AIDS patient activists, it also exhorts scientists to be more receptive to local, lay expertise, which in these two studies seems to offer considerable promise as a supplement to the knowledge of the nominal experts. Indeed, the overall message of *The Golem at Large* centers on expertise. Our faith in the reliability of technology *is* justifiable; but it is warranted by the expertise of the humans who practice it, not by any impersonal scientific method that underlies it.

Many of the more prominent Science Warriors have assailed both the motives and the competence of those who presume to speak about science without proper scientific credentials. These books provide a pleasant and relatively painless opportunity for the interested reader to see what some of those assailees are actually saying. Of the two books, *The Golem* would be the recommendation of choice for scientists with limited time, if for no other reason than that it is more likely to challenge complacent thought patterns, while *The Golem at Large* might be more appropriate for the general public. But both — whether or not one finds their arguments and conclusions convincing, or even palatable — make for entertaining reading for either audience.

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