

## ON SCIENCE AND PSEUDOSCIENCE

JASON ROSENHOUSE

Reviews of *Science or Pseudoscience: Magnetic Healing, Psychic Phenomena and Other Heterodoxies*, by Henry Bauer, University of Illinois Press, 2000, 275 pages, ISBN 0-252-02601-2 and *The Borderlands of Science: Where Sense Meets Nonsense*, by Michael Shermer, Oxford University Press, 2001, 360 pages, ISBN 0-19-514326-4

Is the line between science and pseudoscience set arbitrarily by an often arrogant scientific elite? Henry Bauer, emeritus professor of chemistry at Virginia Polytechnic Institute and State University, believes that it is. While he does not claim that ESP, UFO's, Bigfoots, cold fusion, or any other variety of fringe science is necessarily legitimate, he does claim that many of them might be. He further claims that science does itself a disservice when it allows a stifling orthodoxy to squelch offbeat ideas. Since many of the best ideas in human history began as heresies, we do well to be careful before passing judgment on anything.

Bauer writes, "Comparisons between anomalistics and science as it is actually practiced will show that no sharp division can be established," (7) "anomalistics" being a politically correct term for the study of bizarre claims. He is not impressed by the various checklists served up by philosophers for distinguishing science from pseudoscience. He points out, quite correctly, that not one perfectly distinguishes between the two.

But Bauer is creating a false dichotomy. Science and pseudoscience are opposite ends of a continuum, not rigidly defined categories. Subjects like ESP are dismissed neither for their inherent absurdity nor for their inability to conform to an arbitrary set of philosophical criteria.

They are dismissed because they have never manifested themselves under properly controlled conditions. Confronted with this obvious fact Bauer can only reply with clichés.

Maybe the presence of skeptics kills the vibe necessary for ESP to manifest itself. The numerous eye-witness accounts of paranormal activity should be considered viable evidence. The experts have been wrong before. The unexplained residue of cases that have not been debunked strongly suggest the reality of the paranormal.

These are all fine points if your goal is to defend the logical viability of various anomalous claims. But as arguments for rethinking the nature of science they fall flat. Since even the most hardened skeptic would not deny the possible validity of paranormal phenomena, it seems that Bauer is defending the obvious.

Arrayed against his eminently sensible position, Bauer sees a shadowy troika made up of “debunkers,” “skeptics,” and “science groupies.” These groups are never defined, nor is a single example of unfair activities on their part cited. We are nonetheless deluged with comments like this one: “Skeptics suggest that converting others to their own opinion is the same as educating them, or that convincing others to disbelieve is the same as helping others to become skeptical.” (71) Elsewhere on the same page we are told debunkers dismiss claims of dowsing or parapsychology based on a single test, but no example is given of anyone making such a claim.

Indeed, debunking is nothing more than asking for evidence of paranormal phenomena under conditions that preclude trickery. If Bauer were serious about raising the respectability of anomalous claims, he would welcome rather than denigrate the activities of people like James Randi and groups like the CSICOP.

When Bauer is not slinging mud at his favorite straw men, he is expressing astonishment at the vituperation hurled at people like Immanuel Velikovsky. He writes, “He was wrong in many ways, but he was not a fraud or deliberate charlatan. He wasn’t peddling snake oil or disingenuous tax cuts.” (156) When a man bypasses the informed criticism of his colleagues, and presents his ideas in a popular-level book claiming to be the latest word from science, I call it selling snake oil. On the other side of the coin, he points out that superconductivity was angrily dismissed when first proposed. Sure, and superconductivity earned its acceptance by producing results replicable in any laboratory with the proper equipment. ESP and the rest will have to do likewise before becoming mainstream.

People like Pons and Fleischmann, of cold fusion fame, are reviled because they refused to perform simple experiments that would have

resolved much of the controversy (see Robert Park's *Voodoo Science* for a full account). By contrast, Stephen Jay Gould's heterodox theories about evolution did not keep him from becoming one of the most honored scientists in the world. The difference between the two cases does not lie in philosophical abstractions, but in the way the principles conducted themselves. Pons and Fleischmann consistently avoided the legitimate scrutiny of their peers, whereas Gould positively reveled in the same.

Bauer is up front about his fondness for Loch Ness monsters. I would suggest that it is this, and not any deep questions about proper scientific methodology, that motivates him. He is sore that mainstream science has dismissed many claims he feels to be legitimate. Hence, this book. In lieu of original insights and strong arguments, it offers only silly cliches, uncalled for snideness, and simplistic historical analyses.

There is a further irony in Bauer's book. Though he routinely complains that science needs to be more open to new ideas, his analysis is confined to the oldest topics in the annals of fringe science. ESP, UFO's, and Bigfoots have been around for decades and have been the subject of much serious writing. But what about the many contemporary examples of heretical views within the pantheon of science?

It is these far more interesting heresies that form the basis of Michael Shermer's new book. In his role as President of the Skeptic's Society, Shermer has investigated countless extraordinary claims. There is no one better qualified to assess the difference between science and pseudoscience.

After a detailed introduction in which he recounts his investigation of a remote viewing outfit (and which, incidentally, provides a compelling counterexample to the dogmatic arrogance of skeptics portrayed by Bauer), Shermer offers assessments of various branches of human knowledge seeking. On the science end of the continuum we find such subjects as quantum mechanics and evolution. On the pseudoscience side we find items like creationism, astrology and Bible codes. Rejecting a phony dichotomy between science and pseudoscience does not preclude us from distinguishing between those investigations that have consistently born fruit from those that have not.

But the real action occurs in the center of the continuum. These are the borderlands in the title of the book. Here we find things like superstring theory and the SETI project. Shermer begins by analyzing several heterodox theories, such as the punctuated equilibrium model

of evolution offered by Eldredge and Gould, and the relationship between race and athletic achievement. Particularly impressive is his discussion of human cloning. Shermer offers a compelling alternative to the pompous sermonizing that has surrounded the issue ever since Dolly the sheep became big news in 1997.

From here he turns to the history of science. By comparing the lives and experiences of scientists such as Freud, Darwin, Wallace and Sagan; people whose work straddled the line between orthodoxy and heresy; Shermer offers fascinating insights into the genesis and acceptance of new ideas in science. He makes essential use of the theories offered by social scientist Frank Sulloway in his book *Born to Rebel*, particularly Sulloway's ideas relating birth order to openness to new ideas. Sulloway's theories are themselves controversial, so Shermer's approach may not be to everyone's liking. But it certainly represents an original and valuable contribution to the study of the history of science.

The final section moves from specific people to specific events. Here we find discussions of the Piltdown hoax and the potential dispute (actually resolved peacefully) between Darwin and Wallace concerning the credit for the discovery of evolution. While creationists routinely use both incidents as weapons in their ongoing struggle with modernity, Shermer shows that they offer much of which science can be proud. The Piltdown hoax, for example, illustrates the self-correcting nature of science. Piltdown was exposed not because clear-thinking nonscientists exposed the dogmatism of an arrogant elite, but because paleontologists, on the basis of accumulated evidence, came to view the Piltdown fossils as a square peg in a round hole.

Much of Shermer's past writing has involved exposing popularly held myths, and *Borderlands* is no exception. He argues that the vision of scientific progress that posits geniuses producing revolutions fully-formed in one moment of brilliant insight is one such myth. He backs this up with analyses of perennial favorites such as Einstein and Newton, as well as less familiar cases such as mathematician Evariste Galois. He also dismisses the idea that primitive human civilizations lived in perfect harmony with their environments, unlike their more modern counterparts. These arguments are defended with impressive erudition, as Shermer discusses the relevant literature from history, anthropology, and evolutionary biology.

Skeptical literature often consists of little more than a compendium of stories lamenting the gullibility of the public. Shermer goes well beyond this tried-and-true formula and has produced a book chock-full of original insights and calm argumentation based on meticulously

collected evidence. He is fearless in tackling difficult and subtle issues with relentless common sense. *The Borderlands of Science* will reward careful study, and will doubtless provide fodder for discussion for a long time to come.

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