

Science and Pseudoscience

BARRY MARKOVSKY

At the Fringes of Science. By Michael W. Friedlander. Westview Press, Boulder, Colo., 1995. 196 pp. Hardcover, \$24.95.

In the author's words, "This book has as its central theme the separation of science from pseudoscience and the identification of correct science against a background of errors and impostors that is often present" (p. 159). Michael W. Friedlander, in *At the Fringes of Science*, strikes a careful balance between recounting well-chosen historical cases, analyzing their most salient features, and discussing the more general issues exemplified by the cases. He does not purport to offer a definitive set of demarcation criteria distinguishing science from pseudoscience—a riddle that has, thus far, stumped many a good mind and likely has no definitive solution. Instead, with admirable, straightforward prose, he documents the multidimensionality of scientific and would-be scientific endeavors. In essence, he concludes that what separates the light of science from the darkness of pseudoscience is a long, shadowy dusk. There are no clear boundary lines.

After Friedlander sets the stage in the first chapter, the second reviews two "oldies but goodies": Immanuel Velikovsky's weird astronomy, and fraudulent claims for a compound that supposedly extended the life of car batteries. These cases were characterized as extreme forms of pseudoscience. In contrast, Chapter 3 reviews two cases that were taken seriously by science, though with very different outcomes: Alfred

Wegener's theory of continental drift, and the notorious Fleischmann-Pons cold fusion fiasco.

The inclusion of chapters titled "Science and its Practice" (4) and "The Machinery of Science" (5) contribute to this book's uniqueness. Friedlander is a physicist, and too few working sci-



tists make an effort to describe from the inside how science operates, warts and all. In Chapter 4 he portrays science as a human endeavor of less-than-perfect efficiency, vulnerable to being sidetracked by fraud, ignorance, or politics. At the same time, however, he points out that its successes are undeniable: Science has proved to be vastly superior

to alternatives for its expressed purposes. To be sure, its self-correction mechanisms are sometimes foiled in the near-term and its detractors revel in trumpeting cases of scientific fraud, abuse, and self-deluded demagoguery. The obverse argument seems to elude the detractors, however, for their pet cases are nearly always uncovered, investigated, and disposed of within the family of science.

Chapter 5 provides sufficient detail on the internal communication processes of science to show how this self-policing is possible, and why, generally, it works so well. Friedlander describes and illustrates the workings and interactions of peer review processes, journals, conferences, collegial networks, professional organizations, and graduate training.

Chapter 6 reviews several "Respectable Maverick Ideas": the hypothesis that global cooling and dinosaur extinction followed an asteroid strike of Earth; the special and general relativity theories of Einstein; the Big Bang theory in cosmology; and quantum mechanics. By juxtaposing these ideas with those holding sway in their respective fields, Friedlander dashes the stereotype that mainstream science is rigid and closed. Instead, his cases show that when it comes to considering radical ideas, science is (properly) conservative but not fatuous.

The next chapter, "Walking on Water or Skating on Thin Ice," describes

two cases of maverick ideas greeted with suspicion from their inception. In the 1960s Russian scientists claimed to have discovered "polywater" and experimentally demonstrated its strange properties. More familiar to readers of the SKEPTICAL INQUIRER will be the claim from Jacques Benveniste's team that water can "remember" substances once dissolved in it, but subsequently removed through dilution. These cases illustrated what Friedlander calls "the transition away from mainstream science"; and Chapter 8, on "Tabloid Science," completes the transition. Here he reviews astrology, the "Jupiter Effect," the 1990 earthquake predictions at the New Madrid fault, and claims regarding visitors from outer space.

"Psience," the title of Chapter 9, provides a good, dispassionate overview of the field of parapsychology. The summary is, of necessity, selective; and it is not current insofar as presenting the most recent experimental evidence being offered for psi. However, with its treatment of claims by serious researchers such as Charles Honorton and Robert Jahn and its summaries of skeptics' analyses through the years, the major points are made more than adequately. Friedlander neither dismisses nor praises the work in this field, but closes the chapter with a cautionary note, one of the best lines in the book: "Each generation's best case of psi is cast aside by subsequent generations of parapsychologists and is replaced by newer 'best' cases. It has been, in the words of that noted philosopher of science Yogi Berra, a case of déjà vu all over again."

Fraud is the subject of the tenth chapter, and the author takes a sophisticated, multifaceted view of the effects of fraudulent and quasi-fraudulent claims. He first describes some relatively blatant

Barry Markovsky is professor of sociology at the University of Iowa and director of the Center for the Study of Group Processes. He conducts research on group processes and social influence.

cases such as psychologist Cyril Burt's doctored data and René Blondlot's elusive N-rays. Next, Friedlander presents cases where allegations remain unsolved: the authenticity of some Himalayan fossils, and allegations of data fabrication against Nobel Prize winner David Baltimore. Research conducted by Robert Millikan, another Nobel Prize winner, was placed in a third category. It seems that Millikan may have ignored some of his "noisy" data in reaching conclusions that nevertheless proved sound.

The Lysenko affair in Russia, Nazi science, and creation science form the core of Chapter 11, "Political Pseudoscience." Each field is placed in the context of its host society, and each illustrates ways that nonscientific interests impede scientific progress. The next chapter, "Taking Stock," takes a step back from the book's central issues, providing an integrative discussion of the meaning of scientific facts, past offerings of demarcation criteria, experimental bias, statistical significance, and more. The final chapter deals with "Responding to Fringe Science"—what must be done both within and outside of science to reduce the incidence of pathological science and public misconceptions.

Although all of its factual content can be found elsewhere, *At the Fringes of Science* offers a combination of depth, breadth, gentility, and synthesis that is unique in the skeptical literature. Fringe claims are treated with due respect, cases are given adequate space for reasonably detailed—but not tedious—descriptions, and always their links to broader issues of theory and method are intelligently drawn. There is philosophy of science without posturing or platitude, and sociology of science without ideology or interpretive tangents.

I have adopted the book for a graduate course in sociology called "Theory Construction and Analysis." For my students it is an excellent entrée into discussions about what science is and what it is not, and to what degree areas of contemporary social sciences are pseudoscientific. At the same time, Friedlander's clean style of writing opens the work to a much broader audience. In addition to its potential as a supplemental text in college courses, it would be nice to see Westview Press also pursue a more general readership for *At the Fringes of Science*. It is a superb book and I hope that it will be widely read. □



Flight From Reality

THOMAS H. JUKES

Reason in the Balance: The Case Against Naturalism in Science, Law and Education. By Phillip Johnson. InterVarsity Press, Downers Grove, Ill, 1995, 245 pp. Hardcover, \$19.99.

Reason in the Balance: The Case Against Naturalism in Science, Law and Education is Phillip Johnson's second book; the first was *Darwin on Trial*. Now he is putting naturalism on trial. A dictionary definition of naturalism is "a theory that denies that anything in reality has a supernatural or more than a natural significance; the doctrine that cause-

and-effect laws are adequate to account for all phenomena."

Johnson starts his introduction, "According to public opinion polls, the vast majority of Americans [including Johnson, who says he is a "theist-realist"] are theists, which means they believe (or at least say they believe) that we were created by God, a supernatural being who cares about what we do and