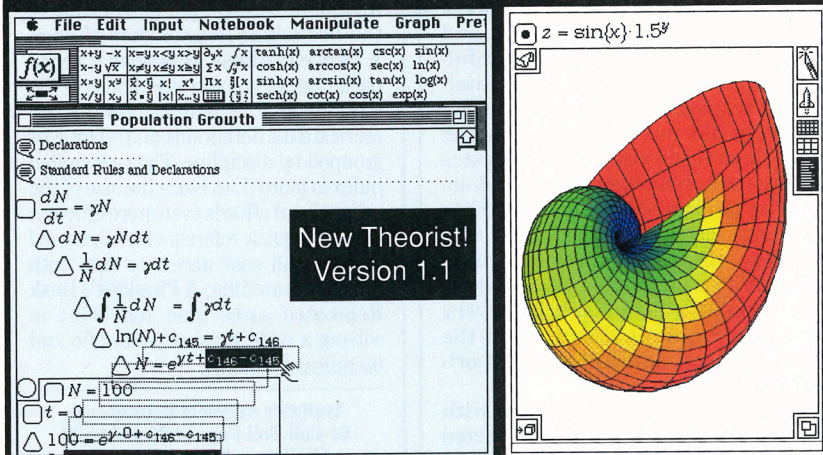


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MARY H. FEHRS
Pacific University

The Fifth Branch: Science Advisors as Policymakers

Sheila Jasanoff
Harvard U. P., Cambridge,
Mass., 1990. 316 pp. \$27.95 hc
ISBN 0-674-30061-0

Sheila Jasanoff is director of Cornell University's Program on Science, Technology and Society. In this book her main concern is how the "fourth branch" of the Federal government—the regulatory agencies—can best use the "fifth branch"—science advisors—to make decisions that will survive challenges from the executive, legislative and judicial branches. She discusses mainly the science advisory experiences of the Environmental Protection Agency and the Food and Drug Administration during the 1980s, although she draws conclusions of more general interest.

The FDA gives advisory committees broad responsibilities, from performing literature reviews to recommending policy, but it reserves the right to overrule such policy recommendations. The EPA, on the other hand, prefers a more adversarial relationship with its advisory committees, which review policies that the EPA staff has proposed. Jasanoff argues that the FDA model works better, because it gives the scientific advisers more latitude to resolve disputes and build consensus by informal negotiation.

The difficulties raised by the EPA's adversarial approach are illustrated by its actions regarding the plant-growth regulator Alar. In 1985 EPA proposed a ban on Alar on the basis of several experiments indicating that it caused cancer in laboratory animals. The proposed ban was then reviewed by the EPA Scientific Advisory Panel, a legislatively mandated body whose members are selected by the EPA administrator from nominations submitted by NSF and NIH. The presentation before the panel pitted EPA staff against experts representing Alar's manufacturer, Uniroyal. The Uniroyal experts attempted to discredit each of the Alar studies individually, but EPA scientists pointed to the coherence of the data as a whole. When the panel sided with Uniroyal despite strong protests from top EPA

officials, the agency decided it had no choice but to permit continued use of Alar pending Uniroyal's submission of new data.

However, the Natural Resources Defense Council then persuaded several supermarket chains to discontinue sale of Alar-treated apples. The NRDC also argued in court that the Scientific Advisory Panel had unlawfully shifted the burden of proving that Alar is safe from the manufacturer to the EPA, but the judge dismissed the case on a technicality. By early 1989 Uniroyal admitted that the new studies were producing alarming results, and the acting EPA administrator urged apple growers to take voluntary action to reduce Alar use. Shortly thereafter media coverage of an NRDC report on Alar created such a furor that Uniroyal withdrew its product. The Scientific Advisory Panel was further humiliated when two senators pointed out that a former panel member had, after his departure from the panel, represented Uniroyal on a technical issue related to Alar.

Jasanoff's book briefly describes three alternatives to traditional science advisory committees that have been tried recently:

▷ Expert elicitation apparently involves interviews with experts on a particular issue; the experts' advice is then numerically averaged. The EPA's Clean Air Scientific Advisory Committee criticized the EPA's use of expert elicitation in areas where good scientific information exists, but did not object to using it in extrapolating animal data to humans.

▷ FDA used a scientific public board of inquiry as a science court to weigh the evidence of negative health effects caused by aspartame, but then rejected the board's advice to ban the sweetener.

▷ The Health Effects Institute, an independent research and policy organization on air pollution founded in 1980 and jointly funded by the EPA and the auto industry, has designed procedures such as independent advisory and review committees that help insure the quality of its reports. Congress has begun to direct EPA to contract with the institute for certain studies.

The Fifth Branch is a useful book. But I would have appreciated a broader critique of science advice in all branches of government and a consideration of criteria other than bureaucratic success for evaluating the effectiveness of science policy decision-making procedures.

JOEL R. PRIMACK

University of California, Santa Cruz

Quantum Profiles

Jeremy Bernstein

Princeton U. P., Princeton,
N. J., 1991. 178 pp. \$17.95 hc
ISBN 0-691-08725

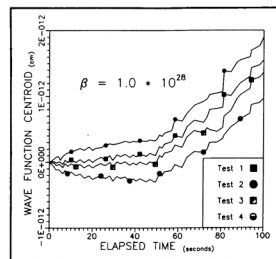
Besides a short piece from *The New Yorker* on the life-long friendship of Michel Besso and Albert Einstein, Jeremy Bernstein has given us two highly readable *New Yorker*-style profiles of John Bell and John Wheeler, deemed, I imagine, too intellectually demanding for the readership of that journal.

The essay on Bell is a tragically timely remembrance of this remarkable man, whose sudden death last fall was a painful personal loss for all who had ever met him and a calamity for anyone dissatisfied with the prevailing complacency over the interpretation of quantum mechanics. Bernstein's vivid evocation of Bell is wonderful, for he sketches his personal and intellectual biography using, whenever he can, Bell's own words. His unforgettable turns of phrase, pronounced in a "lilting Irish brogue," will be brought vibrantly to life for anyone fortunate enough to have heard Bell speak.

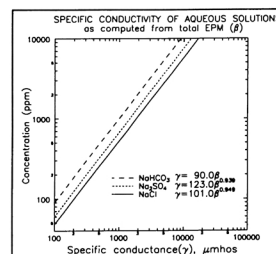
But the presentation of Bell's science is not as skillful as the portrait of the man himself. Bell's simple but brilliant elucidation of the Einstein-Podolsky-Rosen experiment profoundly shaped our understanding of quantum nonlocality, and "Bell's Theorem" acquired a level of popular acclaim exceeded among theorems only by that of Pythagoras. Bernstein's lengthy description of this achievement is either incorrect or very misleading. "If one could construct an EPR apparatus," he explains, "one could use it first to measure implicitly the exact position of the particle at the distant place. One could then modify the apparatus to measure the exact momentum of the distant particle." For a single distant particle one can of course do only one or the other, but this is one of several instances where Bernstein seems to say one can do both.

The point of EPR—that perfect correlations between measurements on well-separated, noninteracting particles seem to demand, as Bell explains to Bernstein, "programs, which have been correlated in advance, telling them how to behave"—is obscured by Bernstein's basing the EPR argument on the notion that a measurement on one particle confers reality on (rather than reveals the preexisting value of) the corresponding property of its correlated partner. Only if we agree that I confer reality

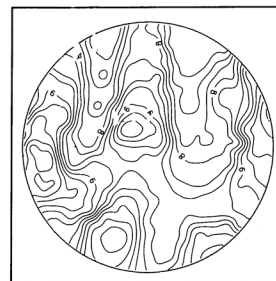
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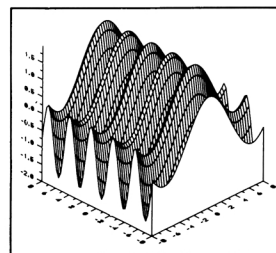
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