BOOKS: SCIENCE POLICY

Politics is Hell

Daniel Sarewitz

"I think it would be useful," counseled Daniel S. Greenberg at the end of his 1967 book *The Politics of Pure Science* (*1*), "for the scientific community to calm down, and, if necessary, perhaps to impose its wondrously effective discipline on those who proclaim a state of crisis in basic research." No one was listening. Only a year later, the New York Academy of Sciences issued a report called *The Crisis Facing American Science* (*2*), and similar proclamations of impending doom have appeared steadily ever since. Greenberg, a journalist who has been documenting the politics of science for 40 years, is not amused.

Science, Money, and Politics
Political Triumph and Ethical Erosion
by Daniel S. Greenberg
University of Chicago Press, Chicago, 2001. 540 pp. $35, £22.50. ISBN 0-226-30634-8.

His new book, *Science, Money, and Politics*, is not a work of political analysis or theory; rather, it is a unique and indispensable guide to the nether regions of the federally funded research enterprise in the United States. What does it reveal? First and foremost, Greenberg depicts a scientific community that behaves remarkably, amusingly, and, at times, terrifyingly like the population at large: neurotic about the state of its health, even as its vitality grows ever stronger; insecure—even disbelieving—about its popularity, despite continual demonstrations from the rest of society that it is not merely appreciated but revered; and stubbornly anti-intellectual in its unwillingness to test its view of the world against facts, experience, and deep reflection. Greenberg is not, of course, writing about scientists qua scientists, but scientists as a special interest group, dependent on federal largesse for their livelihoods, divorced from the dignity and passion of their intellectual calling, and brought very much down to earth by their behavior as advocates for their own cause.

There is something of *Mr. Smith Goes to Washington* here: the bumpkins carrying their belief in truth and rationality into the harsh dens of political iniquity. Thus does Greenberg document how multiple efforts over many years to increase scientific expertise in the State Department have run into a wall of apathy that even reports of the National Academy of Sciences cannot breach. And he tells of the attempt by Nobelist Leon Lederman, with National Science Foundation support, to create a prime-time television drama aimed at advancing public understanding of science. Lederman's pilot script describes a sort of anti–Lake Wobegone, where everyone is a super-genius, diverse ethnic backgrounds abound, and a moral crisis is always at hand. Delivered to network executives, the script was ignored. Such episodes, Greenberg suggests, illustrate "scientists' persistent quest for political influence, without the rigors of participation in conventional politics."

But it's not all Jimmy Stewart; there's also some James Cagney, as in the case of the university president and National Science Board member who tried to strong-arm a member of Congress into canceling a hearing to investigate NSF's questionable projections of an impending "shortfall" of scientists. What's disturbing about this story, and dozens of others that Greenberg tells, is not the raw politics, but the enthusiasm with which scientists, in seeking to advance their interests, abandon the very standards that they are supposed to represent: respect for data, scrutiny of methods, and critical assessment of arguments. In the case of the "shortfall" projections, for example, NSF's work was adopted wholeheartedly by the scientific community to support policies for more funding, even though the analysis was methodologically flawed and had not been subjected to peer review—and even as the real world was experiencing a glut of scientists in many fields.

Greenberg has a sharp eye for this type of contradiction. He skewers the National Academy for its "pious declarations" on behalf of peer review even while it "exists primarily on [noncompetitive] government grants and contracts." He delights in verbal judo, applying to the scientific community the same types of words that scientists themselves so often use to characterize the intellectual failings of the great unwashed. His particular bugbear is what he terms "the scientific leadership's voodoo conviction that public ignorance and hostility [impede] their progress to bigger budgets," a conviction consistently undermined by 50 years of data on public attitudes about science and rising federal expenditures.

Many scientists may find it galling to see their enterprise portrayed from such a starkly political perspective. And certainly part of Greenberg's cantankerous intent is to expose the all-too-human motives and behavior of a community that often rests its demands for public support on the claim of special privilege. But this is not the whole story that he wants to tell. He also believes that the scientific community's ongoing infatuation with money has led to a progressive withdrawal from important political issues. His argument seems to be that scientists have grown increasingly apolitical because they don't want to risk alienating their patrons in Congress and the White House. From this perspective, Greenberg sees the leadership role of the physics community in the Cold War debate over arms control as a high water mark of political participation. He holds that scientists have progressively retreated from this mark in recent years, while becoming less selective about what research they do and who pays for it. Their retreat "finds scientists comfortably established in the scientific ghetto, rarely looking outward except to politick for money for science and minimal regulation of research."

I find his interpretation problematic on two counts. First, Greenberg makes the old-fashioned mistake of equating "physics" with "science." Perhaps physicists are less engaged in politics than they were in the past. But scientists from other disciplines have been, and remain, deeply and productively involved in charged debates over such issues as global climate change, energy policy, ecosystem protection, risk assessment, and the appropriate uses of genetic technologies. In any case, the fraction of scientists involved in national political debate has probably never been very large.

Second, it doesn't seem to me that the scientific community has ever been very choosy about its patrons or its customers. It may be fashionable—as well as reasonable—to be concerned about the impacts

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of corporate research sponsorship on academic integrity. Yet 35 years ago the Defense Department, with its strong connections to private industry, was a far more pervasive influence in campus laboratories than are biotechnology companies today.

At the very beginning of *Science, Money, and Politics*, Greenberg asks the most important questions in science policy: "Could science serve us better? Does it ignore important opportunities for the advancement of knowledge and the betterment of humankind?" Declaring, quite correctly, that these questions "are unwelcome" in the arena of science policy, and that "close examinations have not taken place," he abandons them to the succeeding 460 pages of political exposé. In doing so, however, he misses the opportunity to give greater meaning to his work. Questions about the societal value of government-funded science remain off-limits in political debate because more money for science is widely and uncritically accepted as a guarantee of more benefits for the public. Greenberg could have investigated the validity of this guarantee. In choosing not to do so, he seems content simply to show that the science community's monomaniacal pursuit of bigger budgets is often unsavory. Whether or not this behavior ultimately serves the public interest remains unanswered.

References

1. D. S. Greenberg, *The Politics of Pure Science* (New American Library, New York, 1967).
2. *The Crisis Facing American Science: A Preliminary Report on the Effect of Decreased Federal Support of Scientific Research and Education* (New York Academy of Sciences, New York, 1968).

BOOKS: NEUROSCIENCE

Clear View of a Promising Future

Michael Rutter

Over the years, biological psychiatry has had more than its fair share of false dawns and unfulfilled promises. Are the new claims stemming from the just-concluded "Decade of the Brain" any different? In *Brave New Brain*, a fascinating book written for the lay public, Nancy Andreasen argues persuasively that there are now some real and important discoveries and that these are already altering psychiatric practice and will do so increasingly in the years ahead. She writes as a distinguished clinical neuroscientist, but one whose career began in the field of English literature. Both features are clearly evident in this gripping account, which will be of as much interest to clinicians and to scientists in adjacent fields as to the public at large. Her portrayal of the science is accurate and up to date, and the quality of her writing is outstanding.

The book is distinctive in several respects. Andreasen describes it as a story about a voyage of discovery. Without burdening the reader with technical detail, she depicts biological science as finding out how nature "works"—with the emphasis on the process of discovery as much as on the factual knowledge that accrues. Unusual for a popularizer, she notes some of the key blind alleys and premature claims, whilst going on to describe the accomplishments and what they may mean for patients.

Brave New Brain
Conquering Mental Illness in the Era of the Genome
by Nancy C. Andreasen
Oxford University Press, New York, 2001. 380 pp. $29.95. ISBN 0-19-514509-7.

Andreasen brings out very well the crucial role of basic science in the progress towards improved health care. She shows very good judgment in her discussions of the scientific discoveries, which include useful reminders of the numerous Nobel prizes won in the fields of neuroscience and genetics. Highlighted as part of the broader discussion of brain plasticity are Hubel and Wiesel's demonstration of the effects of experience on brain development and Kandel's delineation of the processes involved in the preservation of memories. Both Carlsson's research on the role of dopamine as a neurotransmitter and Axelrod's studies of the mechanism of norepinephrine reuptake in relation to antidepressant drug action are considered in relation to the neural basis of mental disorders and the development of drug treatments. Crick and Watson's discovery of the structure of DNA is, of course, noted as the crucial step in the work leading to the sequencing of the human genome. Jacob and Monod's research on the on-off switch in gene expression and Berg's work on making recombinant DNA are considered as examples of the investigation of gene action. Hounsfield and Cormack's development of computerized tomography and Purcell and Bloch's development of nuclear magnetic resonance are picked out as milestones in the brain imaging field. These Nobel Prize–winning examples constitute an impressive array of scientific discoveries that are both exciting in terms of their science and important in terms of their clinical implications. But the book does not merely name-drop; Andreasen admirably conveys just what the science comprised and why it mattered.

The coverage of research in the book ranges over a broad territory but stays focused, with the main emphases on brain development, cognitive processing, neurotransmission, gene action, disease genes, and neuroimaging. Even the least scientifically literate should get a good feel for the meaning of the research, and the book allows other readers to learn about areas of science in unfamiliar territory. The language is deceptively simple, the examples are vivid but not misleading, and the specific connections to real everyday clinical issues bring the whole subject to life. Altogether a riveting account.

The coverage of clinical topics is comparable—presenting schizophrenia, mood disorders, anxiety states, and the dementias as the main examples. Through her balanced discussions, Andreasen conveys exactly why the biology is so crucial and why human experiences are vitally important. She is even-handed, and it is clear that she understands such an approach is required for a proper understanding of the functioning of the brain and the workings of the mind.

Brave New Brain concludes with a thoughtful and upbeat discussion of the legal, ethical, and practical issues involved in ensuring that the scientific advances actually improve health care and that potential abuses are avoided. At the end of this chapter, Andreasen raises the question of whether psychiatry should be concerned with curing people or curing society. Her position is clear: "psychiatry must recognize that its role is to treat diseases, not the social discontent of 'unhappy people' or pervasive psychosocial malaise. We simply lack the knowledge to cure society as well as individuals."

Andreasen has written a truly outstanding book. *Brave New Brain* informs, provokes thought, conveys the excitement of science, indicates why science matters, and considers both the achievements with respect to clinical application and the difficulties involved. Quite an achievement!

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BROWSINGS

Nature Loves to Hide. Quantum Physics and the Nature of Reality from a Western Perspective. *Shimon Malin.* Oxford University Press, New York, 2001. 383 pp. $27.50, £27.50. ISBN 0-19-513894-5.

Several popular books have explored the affinity of modern physics with Eastern mysticism. Noting the background of the founders of quantum mechanics, Malin argues instead for a continuity with the traditions of Western philosophy. After presenting a non-mathematical account of quantum physics and discussing the course and outcome of the Bohr-Einstein debate, he explores the relations of the science to the tenets of realism and to the ideas of Plato, Plotinus, and Whitehead.