

HAS 'BIG MONEY' CORRUPTED SCIENCE?

REVIEWED BY WIL LEPKOWSKI

The story of science in America since World War II is one of astonishing discovery, high visibility, immersion in critical national debates, and considerable controversy. It spans four distinct social and political periods, and as a science journalist, Daniel S. Greenberg has covered them all. He's now written "Science, Money and Politics: Political Triumph and Ethical Erosion," an essentially polemical book that scientific readers will be compelled to wrestle with. To engage this important book with any perspective, a little scaffolding about these periods is needed.

The early period of 1945 to 1965 was dominated by the Cold War issues of space exploration, atomic energy, and Soviet-U.S. relations in which national security and arms control concerns coexisted with dreams of eliminating domestic and global wants. During this period, scientists were so trusted that they sat at the sides of Presidents. Congress created the National Science Foundation. New research agencies sprouted. Science and technology were seen as separate domains, with science dominating public policy. Technology was a matter for the private sector and, as far as federal funding went, for public works and defense.

The turbulent middle period (1966–80) was punctuated by the Middle East oil embargo of 1973 and haunted by the Vietnam War, the Watergate scandal, student uprisings against defense-related research on campuses, and riots in many cities. Pressure grew on science to become more deeply embedded in the social, economic, and environmental crises of the day. NSF established a promising but ultimately doomed science and national needs program. At the same time, scientists were second-guessing some of President Richard Nixon's favorite policies and so upset him that he banished them from advisory positions in the White House. In three years, however, they were back, but with voices muted. Meanwhile, technology, which invigorated and sustained economies, began to move onto the policy stage.

The third period (1981–95) was one of deeper integration of science with technology and industry as Japan threatened to replace the U.S. as the leading techno-economic power. Science was by now beginning to be seen as technology's servant, not master. Industry began outspending the government in the support of research. Intellectual property laws were passed that allowed scientists funded by public money to own and license patents and work with industry in the development of new technological ideas. NSF launched its popular Engineering Research Centers program, drawing universities more closely to the interests of industry. The idea that science was a direct economic tool was by now a working principle.

The period from 1995 to now--let's call it the technicolor dreamcoat period--has a fuller and richer character than the previous three. It commingles previous trajectories with a

deeper convergence of technology into personal, community, and commercial life. Three whizbang technologies dominate. Their prefixes, info-, bio-, and nano-, say it all. Federal agencies, which fund research in them, breathlessly hype them, and industry bellows in faithful chorus their glorious potential.

What we have before us, then, is a culture that appears on the brink of material mastery, but that mastery can come at high financial, social, and ethical costs. Genies can escape bottles, and if there is any overriding debate in science and policy today, it is about those info, bio, and nano (plus who knows what other) genies on the loose--playfully, even malevolently, defying capture. Technology and the science that feeds into it have become the wonderment and concern of us all.

Against this backdrop of contested visions has arisen an unquestioned need for writers who can make some sense of the interactions between science and everything else to advance beyond reflecting the sheer wonder of discovery and enter zones where science and technology impact people and institutions. Call it a journalism of change, if you will, or at least a critical journalism that descriptively and even ethnographically presents just how scientists navigate the social and political waters when they assess problems and prescribe or muddy solutions. These scientists/technologists are important people and play important roles outside their labs in the directions these nano-bio-info technologies will be taking.

That, to my thinking, is how anyone should approach "Science, Money and Politics." As I picked up this book, I asked myself whether it would, in a reasonably full, honest, and accurate way, describe and interpret the mingling of politics and science over the past three decades with these sorts of phenomena ahead of us. I also asked whether it would describe the evolution of the relationship between science, technology, and politics and offer some sort of road map for the betterment of the system.

If anyone can pull off such a triumph of synthesis, Greenberg ought to be the one. He has not only covered every major issue in science and its politics over the past 40 years, but he's done it in a colorful, inventive, insightful, sometimes scholarly, often derisive style. He began his science writing career in the early 1960s as a reporter for *Science*, then became its news editor. He eventually left the magazine to found his own biweekly newsletter, *Science & Government Report*.

"Science, Money and Politics" is made up of 28 chapters, plus an excellent introduction and a so-so epilogue. The chapters cover such events, issues, and phenomena as Congress' 1994 decision to kill the Superconducting Super Collider (almost doomed from the start anyway), the up and down attempts by scientists to influence foreign affairs, and the political success of science accompanied by its simultaneous aversion to participation in elective politics. Other chapters describe the pernicious pursuit of money by academic institutions through their merger of interests with industry, the sordid efforts by NSF to make a bogus case a decade ago that the country faced a serious shortage of scientists and engineers, the crafty use of public understanding of science programs by scientific organizations to draw more public support for research funding, how the scientific

establishment uses the production of reports to advance its own kind of politics, false pleas of poverty by the big research universities, and much else.

Greenberg doesn't have much good to say about anyone in the lucre-conscious ghetto world he labels "science." (Although buried in the text is a whispered admission that maybe the money raised can be well spent after all.) Money--greed is a word he uses only infrequently--dominates science's agenda today, Greenberg repeatedly says, and the politics that science practices is of the smile and shoeshine kind, basically a con game.

The book's chapters are well reported and informative. That is a given with Greenberg. Still, they display little sense of sequence and are connected by only the loosest transitions. But that's all right if the separate stories are all one is looking for. People with an appetite for policy laced with lampoon will find succulence in Greenberg's chapters as separate tales.

What is bothersome is Greenberg's epilogue, which seems off-handedly written and forms a thinly thought-out series of suggestions as to how the system can free itself of the corruption it has largely sought. He proposes, for example, conversion of NSF into a National Science, Engineering & Humanities Foundation and an end to research in the physical sciences at the Department of Energy. The thoughts appear to come out of nowhere and lack connection to the content of the earlier chapters. On the other hand, his introduction is a splendid portrait of basic science's current political and financial condition.

The main trouble with the book, I think, is the incomplete picture it presents of postwar science and technology. One can argue that Greenberg has a legitimate right to limit his topic to science, its politics and funding practices. But does Greenberg's "science" really represent the science that is practiced in the U.S.? Does what he writes ring true in such fields as materials science, agricultural science, and the many fields of chemistry? Is it the science found in big labs and little labs, in the workaday world of research? All of these faces of science have their character and their politics. Greenberg paints science with one color, the science of the administrators and lobbyists, the science that has lost its soul to "money" and has indulged in deceptions to keep the money flowing.

As polemical journalism, the technique works. And make no mistake, the selling out of several academic laboratories (science) to commercial interests is a real problem today. Here, Greenberg has it right in the department of eroded values. None of this is news, however. The press is full of stories of bungled clinical research, suppression of academic research findings by the sponsoring corporation, lawsuits over patent rights, and the worrisome growth in conflict-of-interest controversies in academic biomedicine.

But Greenberg offers no convincing antidotes to the problem. He was given a year's fellowship at Johns Hopkins University to work on this book. That university is itself a major research institution and one of the big operators in the research exploitation sweepstakes, having realized more than \$6 million in licensing fees in fiscal 2001. An

examination of how Johns Hopkins faculty and staff feel about the academic sellout issue in their own institution would have made a welcome chapter.

He might also have considered how technology became ascendant in policy and eventually took over center stage from science. Greenberg does not describe that fascinating and important process, impelled in part by legitimate arguments that research left to sit unexploited does an economy no good. He writes of the consequences of the commodification of academic research, such as industry now writing the ticket for scientific priorities. But a book as ambitious as this one needs some careful descriptives of the big technological takeover and the pressures academic research has imposed upon itself.

Greenberg's approach draws the reader into the illusion that science is all about money, while anyone who follows the system knows it isn't only that. Money means jobs; it means academic achievement, better facilities to do research, and the means to realize dreams. He offers no "moral equivalent of money" in the culture of science, only the repeated demand that science would solve its image problems and find an honest role for itself by plunging into the political game by, say, forming political action committees (PACs). Yet he must know that PACs have helped spawn a political corruption of their own and are one stimulus behind campaign finance reform.

Read this book with the kind of eye Greenberg trains on science. It's clearly a polemic, but the stories, if one dismisses the pejoratives, are well told. It is also a needed wake-up call to science about the serious problems it has created for itself.

I hesitate to recommend adding a new chapter to an already chapter-swollen book, but Greenberg might have made some powerful points about science's ghetto mentality by reporting on a real policy scandal that took place at NSF in the 1980s. I refer to the lynching of a program specifically designed to draw researchers into helping solve problems in the real world, called Research Applied to National Needs. RANN's process wasn't perfect; the results were sometimes disappointing. But the basic science community, lacking any control of the program and feeling robbed of funding it might otherwise have received, engineered the program's end. To this day the community expresses no regret about the loss of a program that might have helped bring science out of the ghetto Greenberg describes so well.