With the Office of Management and Budget cracking the whip, the Administration has consistently sought to shift funds for federal support of research training from institutional grants to individual fellowships and, in fact, has preferred support of training through research assistantships paid for through research grants. Just as doggedly, the Administration has argued that the bulk of training funds should go into postdoctoral fellowships rather than predoctoral support. One crop of special "Weinberger fellowships," named for HEW Secretary Caspar W. Weinberger, were a departmental effort to assert the postdoctoral principle.

Kennedy and Rogers have been equally adamant that predoctoral training not be slighted. And NIH has been faithful in its fashion to predoctoral training, all of which has been supported through training grants since 1968. (For fiscal year 1975, about 6500 predoctoral traineeships and about 5900 postdoctoral traineeships and fellowships are expected to be awarded.)

The new law specifies that no less than 25 percent of NRS Awards go to individuals, and informed observers expect that approximately 75 percent of funds for the current fiscal year will, in fact, go to grants to institutions and 25 percent to individual fellowships. The congressional appropriation for fiscal year 1975 is $151 million, and this year NIH will be responsible for identifying needed areas of research in making the awards.

A difficulty this year and for a few more years is that training funds will be disbursed through multiple programs, compounding the confusion for NIH's constituency. "Continuation" payments on grants and fellowships awarded under the "old" NIH program will be made. Weinberger fellowships also claim funds. And a start will be made in giving NRS Awards. Adding to the confusion is the fact that the new law, as it now stands, must be renewed annually. Some relief is promised if NRS award legislation is extended for more than a single year, as Kennedy and Rogers intend. But as long as Congress and the Administration continue to be so resolutely at odds, the uncertainty will persist. And comments collected in a random sounding of researchers involved indicates that "instability" in the training sector has been as hard to adapt to as the cut in funds. As one observer put it, "This yo-yo approach to [research training policy] is what creates confusion, makes it impossible for faculty and students to do any real planning, and causes an inefficient use of funds."—JOHN WALSH

The Brain Bank of America: Auditing the Academy

The National Academy of Sciences (NAS) comes under serious criticism in a report conducted under the auspices of consumer advocate Ralph Nader and published this month.* Written by former News and Comment staffer Philip M. Boffey, the report concludes that the studies prepared by the academy's committees "often fall short of the very high quality one would expect from the nation's preeminent scientific institution." The problem, Boffey says, is that many NAS studies are "mediocre or flawed by bias or subservience to the funding agencies." His general solution is that the academy should do less and do it better, by being more open in the conduct of its business, by ensuring that contrary points of view are represented on its committees and, most of all, by breaking free of a debilitating master-servant relationship with its sources of support.

Many Nader reports are black-and-white indictments that lay out the charges in terms of sustained outrage and arrive at a preordained verdict. Boffey's study, based on more than 500 interviews, is no hasty hatchet job. Within its chosen framework, that of a critical assessment, it appears to be evenhanded and scholarly. The conclusions proceed from clearly stated evidence and are modified with frequent counterexamples and almost as many "on-the-one-hand's" and "on-the-other-hand's" as an academy report. While admitting there is no perfect yardstick for measuring the academy's performance, Boffey says that he has tried to assemble "the kind of evidence that would be persuasive even to most academicians."

NAS president Philip Handler declined a request to discuss the study, saying through an intermediary that he had perused only part of it and was reserving the rest for his summer reading at Woods Hole. At the NAS annual meeting in April, however, Handler described the study as a "very careful analysis of our defects." He told academy members that the study was not balanced and did not claim to be, adding that "The number of skeletons in the closet, it seemed to me, must be rather a disappointment to the author."

That depends, maybe, on what you recognize as a skeleton. In the sense of a discovery that conflicts with the closet-owner's public image, *The Brain Bank of America* is an Ezekiel's valley of bones, rattling with skeletons of all shapes and sizes. There are jocular little skeletons, like the circumstance that an academy subcommittee on dog and cat food standards was headed until 1973 by an official of Ralston Purina Co., a major manufacturer of pet foods. There are ludicrous but larger-looming skeletons, such as the case of the TV dinners, in which industry representatives apparently persuaded an NAS committee to adulterate a recommended dietary standard for such repasts; or the case of highway litter, in which a group of bottlers and canners, through an organization called Keep America Beautiful Inc., hired the academy to study roadside trash and gained from the NAS's Highway Research Board a highly satisfactory verdict stressing public education as the key to the problem rather than preventive action by bottle and can makers.

Then there are more serious skeletons, such as the public policy issues examined in the book's six case studies. Individual academy reports have often been criticized for lack of balance in the past. Boffey's study is unusual because on each of his chosen issues he has scrutinized a historical series of academy reports, along with the various positions taken by other scientific groups in and outside of government.

This technique has allowed Boffey to discern a trend in the academy's reporting. His thesis, put in most general terms, is that, although no one can "buy" a particular verdict, the academy is not sufficiently independent to resist pressures from special interests, such as the government, industry, and the scientific community.

Boffey characterizes the academy's relationship with the government, its major contractor, as one in which the academy has become a "technical hand-

*Philip M. Boffey, *The Brain Bank of America* (McGraw-Hill, New York, 1975), $10.95.

maiden." He continues: "The Academy's inability to say no to government, coupled with its lack of funds to finance projects of its own, means that the Academy almost invariably plays a supportive, rather than challenging role toward the government."

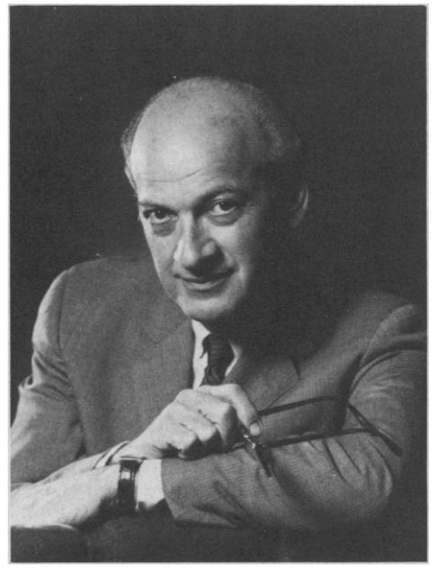
This thesis is documented in the six meticulously analyzed case studies that form the core of the book. The case studies are not examples of trivial technical questions that did not merit the academy's best attention. They concern problems that are or have been among the most important issues of science and public policy in the last decade—disposal of radioactive waste; the supersonic transport (SST); the defoliation program in Vietnam; food additives; persistent pesticides; and airborne lead pollution.

In the case of radioactive wastes, Boffey chronicles how an academy committee formed in the mid-1950's took an aggressively independent stance in advising the Atomic Energy Commission (AEC). It suggested new approaches to the AEC and was highly critical of existing waste management operations at AEC plants. But the committee was too independent for the AEC's taste. Its critical views were buried by the AEC, with the academy's acquiescence.† Finally, in 1967, the AEC insisted that the committee be disbanded. The academy was permitted to establish a new committee, but the price was high. The AEC retained an implied veto over its membership and the right to suppress reports it did not like. The new chairman was a former official of the AEC's reactor division, the very division which had been at war with the previous committee, and all its members had ties of one kind or another with the AEC.

The new committee so far has issued three reports, each of which "has been supportive of the AEC, although none can be described as a complete whitewash." One of its reports gave a qualified endorsement to the AEC's selection of the salt bed site near Lyons, Kansas, as a repository for radioactive wastes. But for reasons the committee only partly foresaw, the Lyons site turned out to be unsuitable.

Boffey draws the conclusion from this case study that, to keep watch over the Faustian operations of the AEC and its successor agencies, the nation needs a group of full-time scientists, totally independent of AEC funding and influence. Part-timers, reliant on the AEC's data and donations, "just cannot do the job."

†Under a new contract policy, the academy now retains the right to publish its unclassified reports. A limitation on this reform, according to Boffey, is that many academy committees submit advisory letters and memoranda to government agencies that are not published as reports. Some committees refuse to make these documents available, even though all reports, whether published or not, are supposed to be available for public inspection.

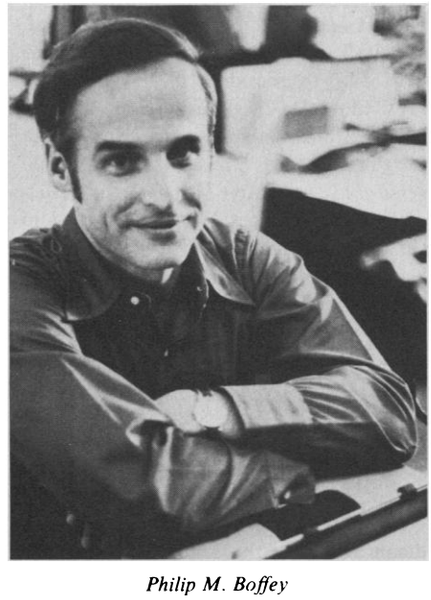


Philip Handler

Turning to the SST, Boffey quotes academician Harvey Brooks of Harvard as remarking, "The SST work was not the proudest accomplishment of the Academy but it was not disgraceful." The litany of the academy's actions illustrates what Brooks had in mind.

On defoliation, Boffey compares the academy's ventures unfavorably with those of the AAAS in the late 1960's:

> The Academy expressed no interest in the herbicide issue until it allowed DOD [the Department of Defense] to use its prestige to bolster [a DOD funded herbicide study]. On that occasion, it put the review [of the DOD study] in the hands of a former herbicide program official, set up a committee that seemed biased toward the users of herbicides, and issued a wishy-washy report that failed to grapple with the issues AAAS had raised. Then the Academy lapsed into silence until, once again, it proved useful to DOD and its allies on Capitol Hill to bring the Academy back into play in another effort to blunt criticism of the herbicide program. . . . It seems clear that, had the herbicide problem been left solely to the Academy, the pertinent questions would not even have been asked.



Philip M. Boffey

The paradigm that emerges from these and the other three case studies is that it is usually scientists outside the academy who first raise questions about an issue of public importance. The government asks the academy to investigate, but either the agency defines the brief too narrowly, or the members of the NAS committee are drawn from too narrow a range of opinion, and the academy's findings fall on the stay-put, business-as-usual side of the issue. Times change, the academy less rapidly; the issue is resolved, and it turns out that the critics of the status quo were in many respects the more farsighted.

Boffey notes that there are exceptions to this paradigm. One can find instances where academy committees "have shown substantial independence from government and industry viewpoints. Moreover, it should be acknowledged that the Academy tries harder than most consulting groups to eliminate bias from its advisory committees." But, Boffey says, the number of defective reports produced has, in the belief of some NAS members, been "distressingly high." He quotes Brooks as saying in a letter to Nobel laureate George Wald: "I have a huge file of correspondence with respect to the SST sonic boom report, the defoliation report, the civil defense report, the mineral sciences report, and hundreds of other NRC [National Research Council—the academy's operating arm] reports which I had been collecting as a 'Chamber of Horrors.' "

Boffey also faults the academy for sins of omission. "The Academy has seldom taken the lead in pushing for solutions to major societal problems; instead, it has often allowed itself to be used as a shield by those intent on preserving business-as-usual." Great debates in which the academy did little to inform the nation include the issues of nuclear fallout, the anti-ballistic missile system, chemical and biological warfare, nuclear reactor safety, automobile safety, the environmental movement, and the improvement of health care.

Structural reforms apart, Boffey notes that the professional caliber of the academy's staff "has never been one of the academy's strong points. A few staffers are considered highly competent by their professional peers but most are considered mediocre." Boffey also questions the quality of members recruited under the academy's present election system. He remarks on the academy's cliquishness—the membership is even more concentrated in the

elite universities than seems reasonable on the basis of other measures of where scientific talent is located—and notes that, between 1950 and 1973, 12 Americans who received the Nobel prize were not academy members at the time. The deficiencies of the Academy membership should not be exaggerated and members are, by and large, a distinguished lot; but, Boffey observes, "they are not necessarily the best of American science, nor are they drawn equitably from the full range of scientific disciplines and institutions, nor do they include the young, vigorous, active scientists working at the frontiers of knowledge. Thus . . . the Academy should cast its electoral net much wider than in the past."

The vantage point of his study, Boffey says, "is that of the citizen who would like the Academy to bring the nation's best scientific talents to bear on societal problems and then enunciate, unflinchingly and unequivocally, the nearest possible approximation to the truth." It is clear that the academy "all too often, turns in a flawed performance." What is to be done? The academy has recently introduced a number of reforms—particularly the establishment of a high-level report review committee—which, Boffey says, should help to alleviate some of the defects he found. The reforms are all admirable in intent, but many of them do not go far enough toward eliminating the specific problems they were designed to prevent. (For example, committee members now have to complete statements indicating possible sources of bias—but the academy does not publish the statements.) Nor do the reforms as a whole provide a fundamental solution to the academy's major weakness: its master-servant relationship with the government agencies and industrial interests which provide financial support. Boffey details his own prescription for reform, a carefully thought-out analysis that covers the full range of the academy's activity. His most radical recommendation is that, to reduce its dependence, the academy should cut back its burgeoning bureaucracy to a size it can support from its own funds. Instead of taking on every odd job the government tosses its way, the academy should accept only the projects which require a broader or more independent study than the interested agency is likely to make. If this were done, the academy might come to deserve the accolade bestowed by one of its former presidents, that it is a "supreme court of final advice" whose findings are "wholly in the public interest, uninfluenced by any elements of personal, economic or political force."

Boffey concedes in his preface that he has not found a perfect measure for the academy's performance. One of the achievements of his study is that it creates a yardstick. It will be hard for any reader of *The Brain Bank of America* to peruse an NAS report without asking if the academy has attained the elaborate standards of impartiality and independence that Boffey has held up for it, as well as avoiding the various defects he has described. Nor can Boffey's advice be ignored—that each academy report must be judged on its own merit, not accepted on faith just because it bears the academy's imprimatur.

In a broader context, *The Brain Bank of America* is an important contribution to the science policy literature. Its fundamental lesson is well stated in the preface:

> Ours is a society that believes in expertise, that constantly genuflects before the presumed wisdom of experts. . . . The public tends to assume that these expert advisers dispense some sort of objective truth, the "right" answer to the problem under consideration. But such implicit trust is misplaced. There are relatively few public policy questions whose answers are purely technical. In almost all cases, an element of informed judgment is required, and what comes strutting out as "objective" wisdom is actually the subjective opinion of those who prepared the advice. Unfortunately, those expert advisers can be just as biased and pigheaded as you and me, and they can be just as foolishly wrong as we often are.

The fallibility of experts is an old truth, but it bears repeating.—NICHOLAS WADE

APPOINTMENTS

Kenneth W. Ford, professor of physics, University of Massachusetts, to president, New Mexico Institute of Mining & Technology. . . . **John K. Hulm**, former research director, Westinghouse Electric Corporation, to science attache, American Embassy, London. . . . **Roland C. Rautenstraus**, executive vice president, University of Colorado, to president of the university. . . . **Clifford D. Clark**, academic vice president, State University of New York, Binghamton, to president of the university. . . . **A. Walter Olson**, dean, College of Arts and Sciences, Western Illinois University, to president, California State College, Stanislaus. . . . **Roger L. Mitchell**, dean of extension, University of Mississippi-Columbia, to vice president for agriculture, Kansas State University. . . . **Melvin D. George**, dean, College of Arts and Sciences, University of Nebraska-Lincoln, to vice president for academic affairs, University of Missouri. . . . **Samuel H. Rubin**, executive dean, New York Medical College, to dean and vice president for academic affairs at the college. . . . **Arnold B. Grobman**, special assistant to the president, University of Illinois, to chancellor, University of Missouri, St. Louis. . . . **Daniel C. Tosteson**, chairman, physiology and pharmacology department, Duke University School of Medicine, to dean, Biological Sciences Division and The Pritzker School of Medicine, University of Chicago. . . . At the Michigan Cancer Foundation: **Marvin A. Rich**, director of biological sciences, to director of research, and **Samuel B. Horowitz**, chief, Cell Biology Laboratory, to chairman, biology department. . . . **Robert B. Nordberg**, professor of education, Marquette University, to dean, School of Education at the university. . . . **William P. Ilgen**, associate professor of civil engineering, Gonzaga University, to dean, School of Engineering at the university. . . . **Cleo Abraham**, director, Center for Urban Education, University of Massachusetts, to dean, School of Education, Texas Southern University. . . . **David G. Barry**, professor of biology, Evergreen State College, to dean, Graduate School, University of Toledo. . . . **B. L. Atchley**, associate dean, School of Engineering, University of Missouri, Rolla, to dean, College of Engineering, West Virginia University. . . . **Tony Bonaparte**, acting dean, Graduate School, Pace University, to dean. . . . **Jack W. Bennett**, assistant director, optometry division, Indiana University, to dean, College of Optometry, Ferris State College. . . . **Donald W. Benson**, chairman, anesthesiology department, Johns Hopkins University, to chairman, anesthesiology department, University of Chicago. . . . **Donald Silver**, professor of medicine, Duke University, to chairman, surgery department, University of Missouri, Columbia. . . . **Louis H. Guernsey**, former chief, dentistry department, Walter Reed Army Medical Center, to chairman, oral surgery department, University of Pennsylvania. . . . **Vittorio Defendi**, professor of pathology, University of Pennsylvania, to chairman, pathology department, New York University School of Medicine. . . . **H. Hugh Fudenberg**, professor of medicine, University of California School of Medicine, San Francisco, to chairman, basic and clinical immunology and microbiology department, Medical University of South Carolina. . . . **Stanley Bruckenstein**, professor of chemistry, State University of New York, Buffalo, to chairman of the department. . . . **Theodore Tamir**, professor of electrophysics, Polytechnic Institute of New York, to chairman, electrical engineering and electrophysics department at the institute. . . . **Robert C. Neerhout**, professor of pediatrics, University of California School of Medicine, Los Angeles, to chairman, pediatrics department, University of Oregon Medical School.