GRADUATE EDUCATION

Report Advocates "Value-Added" Ph.D.

The essence of the scientific Ph.D. in the United States should not be changed, despite dramatic alterations in employment and funding for researchers who hold the degree. That's the bottom line from a new National Academy of Sciences (NAS) report* released this week, although the report did advocate training Ph.Ds in a broader range of skills to make them more flexible in an uncertain job market.

A panel of the NAS Committee on Science, Engineering, and Public Policy (COSEPUP) has rejected the idea—which has been floating around since the '70s—of modifying Ph.D. training to abbreviate research requirements for scientists not planning academic research careers. The group also rejected the idea of imposing controls on graduate enrollments.

Panel Chair Phillip A. Griffiths, director of the Institute for Advanced Study in Princeton, New Jersey, says his group solicited comments from industrial employers, university academics, and Ph.D. students. The issue of whether scientific Ph.D.s are overeducated for today's needs was "an open question in our minds when we started," he says. But from the industrial sector in particular, the panel got the message that "the experience of having conceived and carried out an original product was invaluable," he says. So it rejected the notion of an abbreviated doctorate—"one that critics might think of as 'Ph.D.-lite,' " says the report.

Yet some changes do need to be made, the panel says. It favors de-emphasizing research assistantships in favor of training grants in order to give graduate students more flexibility. And students are going to have to develop a much broader range of skills, says the report—"especially the ability to communicate complex ideas to nonspecialists and the ability to work well in teams." As a model program, the panel cites the "value-added Ph.D" at Drexel University in Philadelphia, which emphasizes the acquisition of business knowledge and policy studies.

A central message of the report is that students need access to timely information about the job market as they make their educational decisions. Says Griffiths: "What struck us ... was time and again people were saying they just wished they had better access to information." The panel therefore calls for a "national database on employment options and trends" that includes up-to-the-minute information on graduate programs, financial aid, and placement rates. Academic departments should get more detailed information on the fate of their students. The National Science Foundation is already on this particular case: Officials are meeting next week with information-systems specialists from 15 scientific societies to explore how to improve employment data.

Despite these tweaks, the COSEPUP panel is basically defending the status quo, says David Goodstein, vice provost of the California Institute of Technology. That posture may not appeal to job-hungry grad students. "What they propose may be right," Goodstein says. "But I can't escape the feeling that this is a committee of the winners, and what they're saying is 'Don't change the rules.' "

—Constance Holden

* "Reshaping the Graduate Education of Scientists and Engineers," available from the National Academy Press. Call 1-800-624-6242.

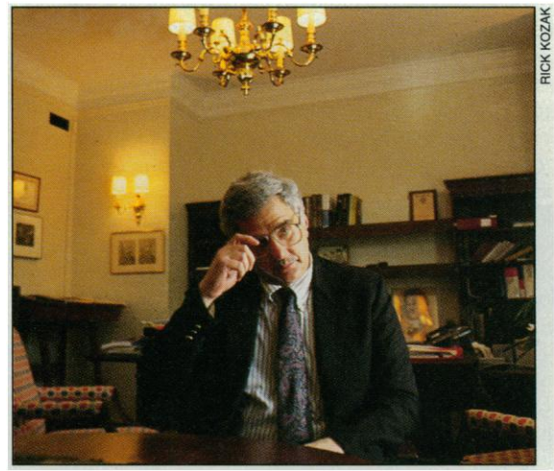
NUCLEAR WASTE

Academy Fends Off Charges of Bias

The National Academy of Sciences (NAS) is at ground zero in the latest debate over possible sites for the long-term storage of radioactive wastes. A group of U.S. senators, state lawmakers, and the academy's own members have accused the NAS of conflict of interest, bias, and excessive secrecy in studies now under way of potential dumps in three states. They've asked NAS President Bruce Alberts to investigate the work of its Radioactive Waste Management Board, which is overseeing the studies. Alberts disputes their charges, saying the board's review is impartial and that the academy has followed its usual procedures in assembling experts.

The controversy stems from reports that the board has ordered on the environmental and geological characteristics of proposed dump sites in Nevada, California, and New York. The Yucca Mountain site in Nevada would handle highly toxic waste, while the Ward Valley site in southern California and an undetermined New York site would store low-level radioactive waste. The studies are being conducted by temporary committees set up last year by the board.

The panel conducting the Ward Valley study was targeted by Senator Barbara Boxer (D–CA), who first complained to Alberts last May. But the politicking has heated up in the past month. Politicians from all three states lashed out at the academy in separate letters to Alberts, and six NAS members from the University of California, San Diego (UCSD), asked him to appoint a special investigation team "to protect both scientific credibility and ensure public safety." On 23 March Senator Richard Bryan (D–NV) asked Alberts to establish an independent commission. On 27 March New York Assemblyman Martin Luster and two other state legislators echoed the senators' concerns, saying there is bountiful evidence that the board "has been taken over by the nuclear industry and promotional agencies whose activities it is expected to evaluate."



RICK KOZAK

Hot topic. Bruce Alberts defends the NAS against critics of waste dump studies.

Evaluating this charge is no easy matter; members of the small community of nuclear-waste experts often work for government, industry, and academia in the course of their careers. The current 21-member board includes nine academic members, with the remainder from industry and government. In a 7 April letter to his colleagues, Alberts replied that "the academy has been scrupulous in maintaining its independence and credibility," noting that each of the studies "is being conducted according to the academy's highest standards of independence, scientific accuracy, and objectivity." Two of the six NAS members now say they are satisfied with the academy's procedures.

However, whether those arguments will persuade others is an open question. NAS officials say they are the target of a campaign led by an organization, The Committee to Bridge the Gap, that opposes the dumps. They see the timing of the letters as part of an effort by the committee and other environmental groups to discredit the board's work—particularly the Ward Valley report—before the studies are completed and made public in the next few months. "This is a well-orchestrated attempt to assure the acad-

emy's credibility is questioned in case it comes out on the positive side of Ward Valley," says Ina Alterman, NAS staff officer of the New York and Ward Valley studies. Jonathan Singer, a UCSD biologist who signed the letter to Alberts and remains concerned about the question of bias, acknowledges that the group provided the impetus for the letter.

The organization's president, Daniel Hirsch, denies a central role in organizing the campaign, but says the academy favors the nuclear industry in its selection of board and panel members. He asserts that only two of the 17 Ward Valley panel members have done consulting work for environmental groups on the effects of toxic or radioactive waste disputes and that many have received grants for work that is sympathetic to industrial concerns. Alterman disagrees with that assessment. "They ask for balance, but balance to them means opposition," she says. Alterman herself has come under criticism from environmental groups, who cite her previous work at the Nuclear Regulatory Commission.

The board's most recent chair, Chris Whipple, has also drawn the ire of state officials and environmentalists. Whipple, who stepped down from the job last month after a 3-year term, is a former executive with the Electric Power Research Institute (EPRI) in Palo Alto, California, which is funded by a consortium of electric utilities. "Having the chair of the NAS Board on Radioactive Waste Management [come] from the nuclear power industry is like placing the head of the Tobacco Institute in charge of an NAS board on the risks of smoking," Luster wrote. Whipple notes that the panel, not the board, is writing the New York report, and that most of his work at EPRI was focused on non-nuclear issues.

NAS Executive Officer William Colglazier says Alberts asked him to review the makeup of the board and panels recently, and that his investigation revealed no evidence of bias or conflict of interest. Impartial experts can come from industry or government agencies, he says.

In addition to their unhappiness over individuals, Boxer and the other lawmakers have criticized the NAS panels for conducting much of their work behind closed doors and for failing to make public conflict-of-interest and bias disclosure forms. Colglazier says the panels have followed standard operating procedure: Many meetings are closed to encourage open debate, conflict-of-interest forms are not released because of privacy concerns, and panelists are carefully screened. To make the point, Alberts even sent Boxer a booklet last year explaining the process.

The debate over potential dump sites promises to continue, as does the controversy over whether the NAS panels can be impartial. The answer, both sides agree, will be contained in the forthcoming reports.

–Andrew Lawler

NATIONAL ACADEMY OF ENGINEERING

In the U.S., Engineers Oust Old Regime

The anti-incumbent mood that blitzed Congress last November is spreading. Now it seems to have hit one of the nation's top scientific societies—the National Academy of Engineering (NAE). In a narrow upset last week, NAE members turned down a candidate for president—Cornelius Pings—who had been hand-picked by the leadership's nominating committee. Instead, by a slim margin of 697 to 660 votes, members elected Harold Liebowitz, a candidate campaigning on a promise to break up the "old boys' club" that he claims dominates the leadership.

This is the first time in the NAE's 31 years that the membership has turned down the nominating committee's choice. Yet the NAE's "new" blood has actually been a part of the very leadership he decried; Liebowitz has served on NAE's governing council and was home secretary for two terms (1978–1984). Nonetheless, Liebowitz has pledged to change the way the NAE does business, although how this will come about remains unclear, as the president-elect says he's just beginning to work out his plans in detail.

President-elect Liebowitz wants to "get members more involved in governance and decision-making" at NAE and gain visibility for the academy.

The campaign was—by the usually placid standards of NAE—a noisy battle, at least on one side. Liebowitz, former dean of engineering at George Washington University in Washington, D.C., conducted what many describe as an aggressive and well-organized run for the leadership post. "There was much more campaigning going on this year than in any election I can remember," says Roland Schmitt, NAE member, former president of Rennselaer Polytechnic Institute in Troy, New York, and former chair of the National Science Board. In addition to official ballot material, members say they received from Liebowitz a self-profile, a campaign platform, a copy of a flattering article in *Science & Government Report*, and endorsements signed by J. Fred Bucy, former chief executive of Texas Instruments Inc., and other prominent engineers.

By contrast, Pings "didn't really campaign at all," says one supporter. His avowed plan was to continue the policies of retiring President Robert White, who had emphasized the need for government support of industrial innovation. Several senior members told *Science* they thought Pings's low-key campaign was just right for a scholarly society like NAE. But it didn't prevail.

And one piece of active campaigning on Pings's behalf may have backfired. Late in the campaign, members say, they received by mail an endorsement of Pings by Robert Seamans of the Massachusetts Institute of Technology. One of NAE's older members, Chalmer Kirkbride, president of the American Institute of Chemical Engineers in 1954, says the letter angered him by referring to Pings's relative youth (he is 64; Liebowitz is 70). Kirkbride fired off an endorsement of Liebowitz, urging members to challenge the "good old boys' club" and "come to the party and vote."

And the party, eventually, was a Liebowitz victory celebration. But the membership's vote remains tricky to interpret, says NAE Home Secretary Simon Ostrach, because the substantive difference between the candidates is hard to discern. Both are experienced in Washington politics. Until last year, Pings was president of the Association of American Universities (AAU). He resigned to "clear the decks" for the NAE election, says an AAU staffer, and is now without a job.

Asked about his reform agenda by *Science*, Liebowitz mentioned three points. He says he would like to "get members more involved in governance and decision-making" at NAE, gain visibility and influence for the academy, and promote engineering education. Beyond that, "it would be premature to discuss" these matters, the president-elect says, for he is "forming a strategic planning group" to grapple with the changes.

His first goal—increasing member participation—may call for some difficult grappling. Home Secretary Ostrach, a Case Western Reserve professor who calls himself a representative of the "working stiff" engineer, says he's already been trying to involve more of NAE's 1790 members on the report-writing committees of the National Research Council (NRC). These small groups oversee studies on all manner of technical issues—from the design of the space station to highway building. But Ostrach points out that it's not easy to find roles for all members, because NRC committees tend to deal with current problems in technology, and older members may not be up-to-date. If those members voted for Liebowitz, however, they may now be waiting for the call from Washington.

–Eliot Marshall