How Engineering Faculty Members Rate Each Other

Faculty members in the chemical engineering program at the University of Minnesota have the best academic reputations in their field, according to a survey of their peers. In most other areas of engineering, however, the faculty at Massachusetts Institute of Technology, the University of California at Berkeley, and Stanford occupy the top spots.

These rankings can be found, with some effort, in the latest volume in a series of assessments of the quality of graduate programs at U.S. universities, published by the National Academy of Sciences.* Previous volumes covered mathematical and physical sciences (*Science*, 8 October, p. 140) and the humanities; yet to come are assessments of programs in biological sciences and social and behavioral sciences.

The assessments list 16 different measures of graduate programs, ranging from the number of their faculty to the size of the university library. The most interesting, and controversial, measures result from an opinion survey in which faculty members were asked to rate the quality of faculty in individual programs on a scale of 0 (not sufficient for doctoral education) to 5 (distinguished).

The report deliberately avoids ranking the programs according to the results of this survey, but since that is the first thing most readers will do, here are the top-ranked schools in each discipline. Scores on the 0 to 5 scale are given in parentheses.

Chemical Engineering: Minnesota (4.9), Wisconsin (4.8), Caltech (4.7), California at Berkeley (4.6), Delaware (4.5), Stanford (4.5), and MIT (4.3).

Civil Engineering: California at Berkeley (4.8), MIT (4.7), Caltech (4.5), Illinois (4.5), Texas (4.2), Stanford (4.1), and Cornell (4.1).

Electrical Engineering: MIT (4.9), California at Berkeley (4.8), Stanford (4.8), Illinois (4.6), California at Los Angeles (4.1), Southern California (4.1), and Cornell (4.0).

Mechanical Engineering: MIT (4.8), California at Berkeley (4.6), Stanford (4.6), Caltech (4.3), Minnesota (4.1), Michigan (4.0), and Princeton (4.0).

Faculty members were also asked to rate graduate programs in terms of their effectiveness in educating students. Not surprisingly, effectiveness is closely correlated with the prestige of the faculty. In each discipline, however, a handful of programs were rated less than "minimally effective." Given the fiscal drought afflicting many campuses, such a rating is not going to help them compete for funds.

—COLIN NORMAN

An Assessment of Research-Doctorate Programs in the United States: Engineering (National Academy of Sciences, Washington, D.C., 1982).

Recollections of the Nuclear Dawning

Reminiscences by a panel of eminent nuclear pioneers at an American Nuclear Society (ANS) symposium on "Historical Perspectives, the Dawn of the Nuclear Age" produced no startling revelations but a number of interesting footnotes.

The leadoff panelist, fittingly enough, was physicist Eugene V. Wigner, one of the instigators of the famous Einstein-to-Roosevelt letter that led to authorization of the Manhattan Project. Wigner was also on hand when Enrico Fermi's group at the University of Chicago achieved the first controlled nuclear chain reaction. The 40th anniversary of that event on 2 December was the main occasion for the symposium at the ANS meeting in Washington, D.C. In his remarks, Wigner put something of a damper on the popular impression that excruciating suspense surrounded that first chain reaction. In fact it went according to plan. "It did not surprise any of us," said Wigner, "we expected it."

I. I. Rabi, like Wigner a Nobel Prize winner in Physics, had been in the know about the Manhattan Project but worked on radar development at the Radiation Laboratory at MIT. At the symposium, Rabi recounted how early in the war Arthur Holly Compton, a kingpin in the Manhattan Project administration, arrived at the Rad Lab on a talent hunt for promising scientists for his program. The Rad Lab at the time was engaged in the urgent task of developing radar for night fighters in Britain. Rabi said he figured that the bomb project already had more brilliant scientists than it needed. He admits he disingenuously downplayed the abilities of the Rad Lab staff, many of whom became stellar names in American science. Apparently convinced, Compton continued on his way, and Rabi remembers that "more or less by a trick we saved microwave radar for the war effort."

General Kenneth D. Nichols, a leading figure among the Army brass that oversaw the project and general manager of the Atomic Energy Commission in the 1950's, enumerated the factors he felt made the project successful. High on his list was security. It was not, however, keeping the Axis in the dark that Nichols stressed. "One of the big advantages of secrecy," he said, was that "people in Washington who liked to kibitz didn't know about it" and therefore couldn't "help" with the project.

A similarly liberating factor was that those in the project were "not bothered by excessive paper work." There were "practically no written directives." Nichols said that when he looked at the total collection of progress reports that were the basic record of the project, they fitted comfortably into one file folder.

Princeton physicist Henry D. Smyth offered his own modest version of how the first official description of the A-bomb became known as the Smyth report. Smyth had been commissioned to explain the origins of the project and the basic science and technology that produced the bomb to a press and public almost totally uninformed about nuclear science. It was released on 11 August 1945, three days after the Hiroshima bomb was dropped, and thus became perhaps the longest and most important press release in history.

A debate about whether to release the report at all was finally settled by an affirmative decision by President Truman. As Smyth told it, the subject matter was so sensitive that the title of the pamphlet, which was to identify the A-bomb project as the subject, was not printed on the cover. It was to be stamped on individual copies when the report was released. The stamp went astray so that the pamphlet was distributed under a long, unilluminating subtitle. And that, Smyth surmised, is why it became known as the Smyth report.

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The panelists, by and large, chose anecdote over assessments of the ethical and historical implications of the development of nuclear energy. Wigner perhaps set the tone when he said, "We immediately recognized that it could mean very good things and very bad things," and left it at that.

An exception was Crawford H. Greenewalt, who went on from war work to become president and chairman of the board of DuPont. In what was almost an aside, Greenewalt said he disagreed with the remark attributed to Robert Oppenheimer that, with the detonation of the bomb, the physicists had known sin. Greenewalt said he rejected the idea that sin lay in the development of the technology of the bomb. His definition: "As long as you think that force is a legitimate solution to conflict, that is the path to destruction."—**JOHN WALSH**

Another Threat to Fetal Research

Antiabortion groups are pushing a proposal in Congress that could potentially prohibit all federally funded research on living fetuses, according to opponents of the measure. The proposal has already passed in the House and may be introduced in the Senate during the lame duck session. Representative William Dannemeyer (R–Calif.), who introduced the bill, says that its purpose is to prevent experimentation on fetuses—in the womb or after they are born—while they are still alive. Critics of the bill, such as the American Medical Association and the Association of American Medical Colleges, charge that existing regulations are adequate. They argue that the Dannemeyer measure is sloppily drafted and leaves room for troublesome interpretation. The Administration has taken a neutral position on the issue, according to a spokeswoman at the Department of Health and Human Services.

The Dannemeyer proposal, which was passed by the House as an amendment to the reauthorization bill for the National Institutes of Health (NIH), states that federally funded scientists shall not experiment on a "living human fetus or infant, whether before or after induced abortion, unless such research or experimentation is done for the purpose of insuring the survival of that fetus or infant." During floor debate, Dannemeyer cited past abuses in fetal research and then quoted from a history book that described Nazi experimentation. The allusion has outraged scientists and others.

Opponents contend that the Dannemeyer amendment, if taken literally, will halt beneficial research that is not immediately therapeutic to a fetus or infant. Representative Henry Waxman (D–Calif.), who opposed the amendment, has said "the Congress has been stampeded into adopting 'Right-to-Life' legislation that will result in continued infant disease, miscarriages and stillbirths."

NIH instituted regulations in 1973 governing fetal research, and no violations have been reported since. The rules state that experimentation on a living fetus after it is born can only be conducted under three circumstances: if the test does not require the infant to be sustained on life-support systems; if the research does not terminate the infant's heartbeat or respiration; or if the tests pose no additional risk to the infant and important biomedical knowledge cannot be obtained by other means. According to a Senate staff aide, the abuses which Dannemeyer cited during House floor debate all predate the 1973 rules.

Pro-life groups are looking to Orrin Hatch (R–Utah) and Jeremiah Denton (R–Ala.) to introduce the proposal as an amendment to the Senate's version of the NIH reauthorization bill. Hatch is chairman of the Labor and Human Resources Committee of which Denton is a member.

A committee staff aide said that Hatch has not decided whether to support the proposal. The aide said that, in his opinion, the measure would put into law what now exists as rules. On the other hand, he says that the language of the Dannemeyer amendment "can be cleaned up." The aide is hoping that a compromise can be worked out so that the pro-life groups are appeased and yet the NIH bill can be passed. Senate majority leader Howard Baker has warned the committee that he will not take up the reauthorization bill during the lame duck session if it contains anything controversial. Hatch has a strong desire to see the bill through because it contains a provision, sponsored by Barry Goldwater (R–Ariz.), to create a new arthritis institute at NIH.

Some NIH officials have privately said that they prefer passage of a continuing resolution rather than a reauthorization bill. They are hoping that support for an arthritis institute and other provisions might fizzle in the next Congress.—**MARJORIE SUN**

Niederhauser Wins Battle for ACS Presidency

By a landslide margin (59 to 41 percent), Warren Niederhauser, director of pioneering research at the Rohm & Haas Company, was elected president of the American Chemical Society (ACS) on 15 November. He defeated his opponent, Texas A & M chemistry professor F. Albert Cotton, by 21,993 to 15,555 votes, collecting "the largest number of votes reported for anyone winning an ACS election," Niederhauser says. He thus becomes the first industrial chemist to head the ACS in 4 years.

The victory was particularly sweet for Niederhauser because he was the butt of a harshly worded campaign letter distributed by Cotton earlier this year (*Science*, 29 October, p. 455). Part of Cotton's strategy was to play upon differences between academic and industrial members of ACS, suggesting that Niederhauser was more interested in parochial concerns such as chemists' working conditions than in substantial scientific issues.

In the aftermath of the landslide, Niederhauser was quick to pass along the results of his own survey, indicating that he was popular among academics and corporate executives as well as the industrial rank and file. At least 13 of 15 ACS board members supported him, Niederhauser says, as did most former ACS presidents and 90 percent of university-based scientists interviewed in October by Rohm & Haas recruiters. The bruises of the campaign are still painful, but some ACS leaders have come forward with a healing proposal. As a gesture of goodwill, Niederhauser says, he and others are planning to nominate Cotton for a Nobel Prize. They hope this will end the bad feelings.

—**ELIOT MARSHALL**