# Grad School Rankings Rankle

**The usual suspects top the National Research Council's exhaustive survey of Ph.D. programs—while those near the bottom fear funding cuts and worse**

Joseph Cerny is a happy man these days. Thirty-five out of 36 doctoral programs surveyed at the University of California, Berkeley—where Cerny is vice chancellor for research and dean of the graduate division—rank among the top 10 programs in their fields in scholarly quality, according to a National Research Council (NRC) report released last week. Chemistry, mathematics, and statistics, among others, hit the number-one spots. No wonder Cerny, who helped plan the NRC report, describes himself as "very pleased."

**CELL AND DEVELOPMENTAL BIOLOGY TOP 10**

| School | Quality of Faculty* | Total Citations for Faculty† | Changes in Program Quality** | Total Faculty |
|---|---|---|---|---|
| 1. MIT | 4.86 | 22,759 (3) | 0.28 | 54 |
| 2. Rockefeller Univ. | 4.77 | 12,486 (10) | 0.20 | 30 |
| 3. UC San Francisco | 4.76 | 19,972 (6) | 0.62 | 55 |
| 4. Caltech | 4.73 | 5,164 (31) | 0.06 | 23 |
| 5. Harvard University | 4.70 | 8,712 (17) | 0.13 | 37 |
| 6. Stanford University | 4.55 | 8,126 (19) | 0.16 | 24 |
| 7. UC San Diego | 4.50 | 34,224 (1) | 0.67 | 109 |
| 8. Univ. of Washington | 4.48 | 32,327 (2) | 0.76 | 174 |
| 9. Washington U. St. Louis | 4.39 | 21,053 (4) | 0.36 | 117 |
| 10. Yale | 4.37 | 8,801 (16) | 0.31 | 40 |

*(0–5; 5 is top score) **over last 5 years (–1 = poorer; +1 = better)
†Numbers in parentheses are overall citation rank.

SOURCE: NAS

Many other academics are not so delighted. Hydrogeologist Douglas Cherkauer of the University of Wisconsin, Milwaukee, for one, says he is "surprised and concerned." Cherkauer is chair of the geosciences department, and his program ranked 97th out of 100 geosciences departments listed. He believes the report's ratings of faculty quality are biased against nontraditional departments such as Milwaukee's, which has an applied science orientation and a broad range of faculty. This bias could have drastic consequences: Cherkauer worries that financially pressed university administrators or state legislators will use the rankings to cut budgets or even whole departments. "There definitely will be repercussions," says Cherkauer.

Cuts were not what the NRC intended to provoke with this report, the first survey of Ph.D. programs in science, engineering, and the humanities compiled by the council since 1982. Co-sponsored by the National Academy of Sciences, the report was primarily designed to help prospective graduate students evaluate programs. The panel compiled a mass of data, supplied by the institutions themselves, on numbers of faculty, students, publications, and types of financial support. But the aspect of the report getting the most attention is the "reputational" ratings, derived from surveys sent to over 8000 university researchers in 41 disciplines. Topping these ratings in 15 physical and biological science fields are familiar names such as the Massachusetts Institute of Technology, Stanford, Harvard, and the University of California (UC), Berkeley. Despite strong showings by UC schools, private universities took a substantial 91 to 63 lead over public ones in the ranks of the top 10.

Criticism of the report is surfacing, not surprisingly, from the bottom of the rolls. Detractors claim the reputational rankings penalize small and up-and-coming disciplines and departments for their lack of professional connections. The survey's reliability has been attacked: Some programs received rankings even though they don't award Ph.D.s. And what many departments consider the most important measure of their success—how many of their graduates find jobs, and where—is missing. Looming over all this is the concern that low rankings could cost programs money and students.

While some of these complaints are "legitimate," admits Marvin Goldberger, dean of natural sciences at UC San Diego and co-chair of the committee that designed the survey, the rankings are just one part of the project. The large amounts of factual data will offset the "ephemeral" nature of prestige ratings, he says.

The NRC report, entitled "Research-Doctorate Programs in the United States: Continuity and Change," ranks 3634 programs at 274 institutions.* The rankings are, for the most part, unsurprising. Science departments at well-known and well-funded institutions continue to boast the best respected faculty (see tables). Indeed, little has changed among these elites since the 1982 survey. In chemistry, for example, Cornell University jumped from 11th in 1982 to sixth in the new survey, while Princeton dropped from 13th to 20th, but the remaining top 20 programs hewed close to their former positions.

But, as Shakespeare wrote, reputation is "oft got without merit and lost without deserving," and to faculty in programs struggling to improve, the NRC rankings bear the Bard out. Several department heads contacted by *Science* asserted that the NRC study's reputational ranking system falls prey to a "halo effect" favoring large, traditional science programs at well-recognized schools regardless of their true quality. The six-member geology department at George Washington University in Washington, D.C., which ranked dead last out of the 100 geoscience departments surveyed, granted only six Ph.D.s in the 4 years preceding the survey, points out chair George Stephens. Although "our im-

**BIOCHEMISTRY AND MOLECULAR BIOLOGY TOP 10**

| School | Quality of Faculty* | Total Citations for Faculty(†) | Changes in Program Quality** | Total Faculty |
|---|---|---|---|---|
| 1. UC San Francisco | 4.84 | 20,875 (4) | 0.56 | 45 |
| 2. (tie) MIT | 4.83 | 22,759 (2) | 0.30 | 54 |
| 2. (tie) Stanford | 4.83 | 4,907 (32) | 0.11 | 14 |
| 4. UC Berkeley | 4.81 | 12,266 (13) | 0.22 | 34 |
| 5. Harvard University | 4.80 | 8,176 (20) | 0.04 | 14 |
| 6. Yale University | 4.59 | 6,770 (24) | 0.25 | 33 |
| 7. Caltech | 4.57 | 8,120 (21) | 0.20 | 30 |
| 8. U. Wisconsin, Madison | 4.55 | 18,021 (8) | 0.19 | 173 |
| 9. UC San Diego | 4.53 | 38,659 (1) | 0.68 | 142 |
| 10. Johns Hopkins | 4.38 | 6,288 (26) | 0.22 | 56 |

*(0–5; 5 is top score) **over last 5 years (–1 = poorer; +1 = better) †Overall citation rank.

SOURCE: NAS

*The report is available over the World Wide Web at http://www.nas.edu/nap/online/researchdoc/

## Survey Unnerves Neuroscientists

Neuroscientists want to be left out. For 2 years, they've been trying to persuade the National Academy of Sciences not to include their field in its survey of graduate education. Ripping up evaluation forms, they've argued that their discipline is too new and too loosely organized for program-by-program rankings to be meaningful. But when the survey appeared last week, neuroscience was included—and neuroscientists were incensed.

"This survey would be laughable, except that people will take it seriously," says Glen Hatton, chair of the neuroscience department at the University of California, Riverside, and president of the Association of Neuroscience Departments and Programs (ANDP). Given a low survey response rate—partly due to an informal boycott—researchers say the ratings are highly suspect. "These aren't real data," says Karen Gale, a neuroscientist at Georgetown University. "Those who were concerned about [the survey] didn't respond, and those who responded may not have had the knowledge to respond."

Criticism of the survey was widespread at ANDP's fall meeting last year, Hatton says, with many researchers revealing that they had refused to participate, fearing that low rankings could cost new programs dearly in terms of funding and the ability to attract students. In January, Hatton and the head of the Society for Neuroscience, Carla Schatz, wrote to academy President Bruce Alberts, calling such ratings "premature" and asking that they be modified or dropped (*Science*, 23 June, p. 1693).

Alberts responded that programs leery of being ranked were free to abstain from the survey, Hatton says. Now, statistical appendices to the NRC report appear to bear the neuroscientists' worries out. They show that the pool of raters who participated in the neuroscience portion of the survey numbered only 211, the lowest of any category in the biological sciences except genetics. For some lesser known neuroscience departments, the number of usable ratings was even smaller, dipping as low as 46 in two cases, far below the goal of 100 ratings per program set by the study's designers. Only 68 of those surveyed, for instance, said they knew enough about Northern Arizona University's neuroscience doctoral program to rate the quality of its faculty. Even those 68 seem to have overestimated their familiarity with the Arizona program, however—the university doesn't even offer a degree in the field (see main text).

Still, not all neuroscientists agree that the field would be better off unrated. Pamela Mellon, a neuroscientist at the number-1-ranked University of California, San Diego, and a member of the committee that planned the survey, says that neuroscience's addition to the list "is a major recognition of the field" and "had it not been there, it would have meant that the field isn't to be taken seriously. That would have been very destructive." But disgruntled neuroscientists say this was a type of recognition they—and their discipline—could do well without.

–W.R.

pact is not very great because we are just too small," Stephens says, lesser known departments like his shouldn't automatically be assumed to be of lower quality. Responses to the NRC survey, Stephens believes, "are based largely on perception rather than hard fact."

This bias against the new was felt keenly at Northern Arizona University (NAU), where the fledgling neuroscience program—which employs only two neuroscience researchers—ranked 101st out of 102 programs surveyed. According to the survey guidelines, NAU should not even have been rated because it has not yet enrolled graduate students, but it was there nonetheless. "This is really damaging," says NAU neuroscientist Kiisa Nishikawa. "We're doing the best we can to build a program, and we certainly don't need the bad publicity." Neuroscience in general is in rebellion against the survey, with researchers asserting that many neuroscience graduate programs are too small, too young, or too decentralized to have acquired fair reputations (see box).

Other faculty members say the survey's breakdown of scientific disciplines—especially the separation of the biological sciences into seven different areas—discriminates against broad departments such as those at Utah State University and the Georgia Institute of Technology. Georgia Tech ranked 178th out of 179 in cell and developmental biology, but biology chair Roger Wartell explains that "we have a single biology unit with a very minimal endeavor in that area. Trying to compare us with a specialized department of cell biology ... is like apples and oranges." In other categories, the school fared slightly better, finishing 90th out of 103 in molecular and general genetics and 112th out of 194 in biochemistry and molecular biology.

Finally, critics such as Ken Sprenke, a geophysicist at the University of Idaho, lament that the most obvious measure of educational effectiveness—the career success of graduates—is completely missing. Although Idaho's department of geology and geophysics ranked 96th out of 100 in the geosciences, "virtually all of our Ph.D. graduates are teaching at colleges or doing research in mineral-related industries," says Sprenke. "They are productive members of society. Those outcomes have been overlooked."

These grievances all add up to worries about money—and the life of a program. Says Milwaukee's Cherkauer: "State legislators will get hold of these rankings, and they'll say 'Why should we be supporting two geosciences programs when one [at the University of Wisconsin, Madison] is number 22 and the other is number 97?' " Cherkauer's concern is not unwarranted. The Ohio State Board of Regents, for instance, is in the midst of a project to cut costs among doctoral programs at the state's 13 public universities. The NRC report "could be useful" in identifying "unnecessary duplication," says Garrison Walters, the board's vice chancellor for academic programs.

The NRC committee was "not unaware" that the rankings would be used by people with their hands on the purse strings, says Goldberger—in fact, the report is partly intended to be a resource for science policymakers—but could think of

**GEOSCIENCES TOP 10**

| School | Quality of Faculty* | Total Citations for Faculty(†) | Changes in Program Quality** | Total Faculty |
|---|---|---|---|---|
| 1. California Institute of Technology | 4.87 | 2976 (2) | 0.05 | 30 |
| 2. Massachusetts Inst. of Technology | 4.67 | 2632 (4) | 0.17 | 41 |
| 3. University of California, Berkeley | 4.45 | 1369 (12) | 0.03 | 17 |
| 4. Columbia University | 4.38 | 2954 (3) | 0.09 | 37 |
| 5. Stanford University | 4.33 | 667 (26) | 0.08 | 12 |
| 6. Univ. of California, San Diego | 4.23 | 1471 (11) | 0.16 | 40 |
| 7. University of Chicago | 4.22 | 1091 (17) | 0.16 | 25 |
| 8. Harvard University | 4.20 | 2180 (5) | –0.32 | 24 |
| 9. (tie) Stanford University | 4.15 | 1121 (16) | –0.09 | 16 |
| 9. (tie) Cornell University | 4.15 | 1474 (10) | 0.04 | 30 |

*(0–5; 5 is top score) **over last 5 years (–1 = poorer; +1 = better) †Overall citation rank.

SOURCE: NAS

no way to prevent this. "The only way we could see to leaven what would otherwise be unfounded conclusions ... was to emphasize the ephemeral character of reputational surveys by providing some 19 other variables by which a program could be judged," Goldberger says. NRC panel members say the fine distinctions are less significant than the broad groupings of quality—top, middle, and bottom—into which the programs fall.

As for fairness, Goldberger continues, "there's no question that there was an 'inverse halo effect' " diminishing small schools' rankings. But the committee had to respect raters' assertions that they were sufficiently familiar with a program to evaluate it fairly. While mistakes—often the fault of sloppy paperwork by university administrators, Goldberger says—did crop up, they were few and far between.

**PHYSICS TOP 10**

| School | Quality of Faculty* | Total Citations for Faculty(†) | Changes in Program Quality** | Total Faculty |
|---|---|---|---|---|
| 1. Harvard University | 4.91 | 5,463 (5) | –0.03 | 32 |
| 2. Princeton University | 4.89 | 5,170 (7) | 0.23 | 47 |
| 3. (tie) MIT | 4.87 | 10,057 (1) | 0.06 | 83 |
| 3. (tie) UC Berkeley | 4.87 | 5,676 (4) | –0.03 | 67 |
| 5. California Institute of Technology | 4.81 | 3,759 (10) | –0.03 | 39 |
| 6. Cornell University | 4.75 | 3,368 (15) | –0.02 | 54 |
| 7. University of Chicago | 4.69 | 8,443 (17) | 0.19 | 40 |
| 8. U. of Illinois, Urbana-Champaign | 4.66 | 1,844 (2) | 0.02 | 98 |
| 9. Stanford University | 4.53 | 8,015 (41) | 0.04 | 25 |
| 10. U. of California, Santa Barbara | 4.43 | 5,132 (3) | 0.60 | 45 |

*(0–5; 5 is top score) **over last 5 years (–1 = poorer; +1 = better) †Overall citation rank.

SOURCE: NAS

Goldberger also admits that data on career outcomes of program graduates would have been very valuable, but "we simply didn't have the resources to pursue that." Berkeley's Cerny is leading a $75,000 pilot study to determine how easily graduates in five fields surveyed in the 1982 study can be located today, with the hope of including career data in the next, as-yet-unscheduled NRC report.

How much help the current report will be to the consumers of graduate education—students themselves—remains to be seen. When deciding which programs are best for them, most students pay closer attention to individual faculty interests and publications than to survey data, says Paul Baum, a doctoral candidate in genetics at Berkeley. That thought may be solace to the faculty at the state-funded University of Southern Mississippi, which finished 179th out of 179 programs in cell and developmental biology and 140th out of 140 in physiology—at least until the rankings reach the capitol in Jackson.

**–Wade Roush**

NIH FUNDING

# The Price of Compromise

The threat of a deadlock in Congress over the bill that funds biomedical research eased a bit last week when a key Senate committee took a step toward the Clinton Administration and away from the conservative line adopted by the House in July. The change occurred on 15 September, when the Senate Appropriations Committee approved HR 2127, a bill that finances the Departments of Labor, Health and Human Services (HHS), and Education. Next stop for the bill will be the floor of the Senate, later this month.

The Senate panel voted to restore cuts made by House conservatives in programs championed by the president and moderate Republicans—including education grants, worker safety provisions, and subsidies for home heating. The Senate panel also stripped out 17 controversial amendments added by the House, covering such topics as abortion and embryo research. The White House had said that these detailed social policy clauses—along with cuts in social programs—would guarantee a presidential veto.

**PROPOSED NIH FUNDING FY 1996 ($ billions)**

| | 1995 Appropriation | Administration Request | House Bill | Senate Bill |
|---|---|---|---|---|
| Amount | 11.297 | 11.764 | 11.939 | 11.598 |
| Increase over 1995 | | +4.1% | +5.7% | +2.7% |

For biomedical researchers, however, the Senate panel's compromise came with a price: Restoring the funds for the other programs would mean a smaller budget for the National Institutes of Health (NIH) than either the House or the Administration wanted. The House had proposed a 5.7% raise in NIH's budget and the White House a boost of 4.1%. But under the Senate plan, it would rise from $11.297 billion to $11.598 billion in 1996, a boost of only 2.7%. The $301 million increase would be spread thinly among NIH's 24 institutes and divisions. At the same time, the Senate committee is asking NIH to trim $41.7 million across the board from administrative expenses by streamlining and consolidating offices.

Led by Senators Mark Hatfield (R–OR) and Arlen Specter (R–PA)—chair of the full appropriations committee and Labor-HHS subcommittee—members agreed to skirt the emotional topics that had slowed action in the House. Congress is facing a backlog of spending bills, Hatfield explained, all of them due to be finished before the fiscal year ends on 30 September. He and Specter persuaded their colleagues to hold back amendments until the bill reaches the Senate floor. Among the items Hatfield and Specter struck out are:

- A ban on human embryo research and the creation of embryos for research.
- A $7.5 million funding "earmark" for the Office of Alternative Medicine at NIH.
- A section allowing states to refuse to fund abortions "to the extent that the state in its sole discretion deems appropriate," except when the mother's life is in danger.
- A requirement that funding not be denied to medical institutions that refuse to provide training in induced abortions.
- Detailed guidelines on the length of time a woman should stay in the hospital after delivering a child.
- A ban on "political advocacy" by federal grantees.

The Senate committee also decided to keep a special funding category created 2 years ago to give prominence to AIDS research at NIH. The House, in a move that upset AIDS activists, threatened to do away with all "earmarking" of AIDS money within the NIH budget, although it would have retained the advisory role of the Office of AIDS Research (*Science*, 21 July, p. 292).

Many, if not all, of these proposals will reappear later—either when the bill reaches the floor of the Senate or when it goes to conference in the House. As a result, Hatfield foresees a long, arduous, and unpredictable battle this fall over the bill's final wording. In the end, he thinks, this bill may well be vetoed by the president in spite of the committee's efforts.

**–Eliot Marshall**