we have to prove it by our actions," says the museum's director, Neil Chalmers. "Collections by themselves are of little value unless they help answer questions important for society," says Gerald Fitzgerald of the Canadian Museum of Nature in Ottawa.

Economic upheaval in former communist countries is also putting many of their collections in jeopardy. "Russia holds some of the world's most important collections," says Blackmore. But botanist Demitry Geltman of the Komorov Botanical Institute in St. Petersburg says the Russian Academy of Sciences has so many institutes to maintain on a limited budget that collection management has a low priority. Part of the roof at the Komorov Institute collapsed in 1993, damaging some of the collections. This has now been repaired with a grant from the International Science Foundation, but the collections are still deteriorating because of poor control of temperature and humidity. With few private sponsors coming forward to help out, Geltman says "international collaborations are vital to maintain the collections." The demise of the Soviet Union also had serious implications for Cuba, home to the richest biota in the Caribbean and some invaluable collections. The sudden end of Soviet funding has forced the closure of its natural history museum indefinitely, says Gilberto De Silva, vice director of the National Museum in Havana. "Proper care of the collections is impossible," he adds.

Museum officials who attended last month's meeting did see some rays of hope, however. Many museums are making their collections accessible remotely through the World Wide Web—which greatly expands the value of individual collections—and collaborations have begun to spring up between Western institutions and museums in developing countries. In Cuba, U.S. organizations such as the MacArthur Foundation and the Smithsonian Institution are providing funds to help maintain Cuban collections. And in Kenya, Joseph Mutangah, a biologist at the National Museums of Kenya in Nairobi, looks longingly at these collaborations. "International partnerships would be really valuable and help raise the profile of museums within [Kenya]," he says.

The Cambridge meeting resolved to have another stab at creating an effective body for coordinating activities and setting global priorities. The effort to create it will be led by Des Griffin of the Australian Museum in Sydney and Mohammed Isahakia of the National Museums of Kenya. "After the Cambridge meeting, I feel much more positive that something will happen," says Blackmore. Creation of an international organization, he adds, would at least remove one potential problem: "At the moment, even if the World Bank or some other agency wanted to help fund natural history collections, where would they send the check?"

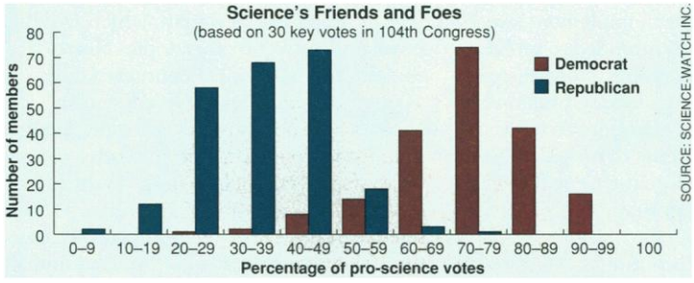
–Nigel Williams

SCIENCE POLICY

Congressional Scorecard Sparks Furor

A scorecard of lawmakers' votes on science-related issues, released last week by a group of distinguished scientists, has provoked a storm of criticism on Capitol Hill and among some science lobbyists who believe its conclusion—that Democrats are far more pro-science than are Republicans—could do more harm than good in building political support for their cause.

The study was done by Science-Watch Services Inc., a new Washington-based organization chaired by Roland Schmitt, a past chair of the National Science Board, and headed by Martin Apple, who is also the president of the Council of Scientific Society Presidents. The group chose 30 floor votes taken in the past 2 years by the House of Representatives—mostly on proposed cuts in a variety of research programs—and assigned ratings to lawmakers. The more frequently one voted in favor of measures considered pro-science, the higher the score. "Our eyes were on those votes that had an effect on the well-being of science," Schmitt says.



Making the grade. Democrats ranked much higher than Republicans did in a controversial analysis of 30 science-related votes in the House.

The results, presented last week at a press conference, were a surprise to Apple, Schmitt, and others who follow science policy. Only one Republican receives a rating above 70%, while 132 Democrats do. And while only three Democrats score below 39%, 140 Republicans do. Sixteen members—all Democrats—received a grade of 90% or higher, while 14 members—all Republicans—scored below 20. The top scorers, with 97%, are two Democrats from Texas—Representatives Ken Bentsen and Sheila Jackson-Lee—while Representative Jim Ramstead (R–MN) ranked last, with 4%.

The exercise was designed to stimulate a grass-roots effort among researchers to educate their representatives about the importance of science, says Schmitt. "Until now the science community has been able to take care of its business inside the Beltway," he says. "That era is passing."

That activist message, however, was lost on many who count themselves friends of science in Washington. In a scathing letter to Apple, House Science Committee Chair Robert Walker (R–PA) rejects the report's "overt subjectivity" and accuses Apple of succumbing "to the temptation to further politicize science." Apple's choice of floor votes is flawed, says Walker, because it equates preserving the scientific status quo with support for science and excludes many unrecorded voice votes where members demonstrated their support for research. "The bottom line of this survey is that if you're a big spender, you get an 'A,' " says Walker. "But if you're an honest student, do your homework, and make the hard decisions about good science, you fail." Walker received a grade of 40% in the survey.

Schmitt dismisses that criticism, saying that it is impossible to include unrecorded votes in a scorecard and that the votes were chosen without regard to ideology. A vote to abolish the congressional Office of Technology Assessment, as the House and Senate did last year at the urging of Republican lawmakers, is an anti-science action because there was broad scientific support for the organization, he says. As for partisanship, Schmitt notes that he was appointed to the science board by Republican President Ronald Reagan.

Democrats quite naturally were delighted by the scorecard. "This could become a very useful tool for the science community to better identify who their friends are," Representative George Brown (D–CA) told *Science*. It could also be a tool to "convert or replace those who don't understand the importance of research," adds the ranking minority member on the House Science Committee, who scored 93%.

That thinly veiled partisan reading of the survey is what worries some congressional staffers and science lobbyists. They fear Science-Watch's effort could backfire by alienating generally supportive Republicans. "It is a serious mistake and may anger members of Congress who have been among the best friends of scientific research," warned Cornelius Pings, president of the Association of American Universities, in a memo to AAU presidents and chancellors. Pings was particularly disturbed by the fact that Representative John Porter (R–IL), chair of the

House panel that oversees medical research funding and a strong advocate for the National Institutes of Health, received a 38% rating in the survey.

The timing of the survey's release—6 weeks before the congressional and presidential elections—is what bothers David Goldston, legislative director for Representative Sherry Boehlert (R–NY). Boehlert, who scored 60% on the scorecard, is a longtime House Science Committee member who is widely seen as a supporter of science. While Goldston agrees that the science community needs to expand its grass-roots activities, he argues that a survey is not the right way to go about it. "This is like firing a salvo. It's a way to start an argument, not a discussion," he says. "Ratings are done to defeat people—to say, 'Let's get rid of these guys.'" Releasing such a survey without taking that into consideration, he adds, is "woefully and dangerously naïve."

Apple says that the survey was released as soon as he could analyze the voting records of the 104th Congress, which has wrapped up debate on most science issues, and that the pending election was immaterial. But he adds that "we did not expect what we saw." Given the forceful response so far from those inside the Beltway, he also may not have expected the furor that those results have created.

–Andrew Lawler

UNDERGRADUATE EDUCATION

In Boston, a Revolutionary Experience

BOSTON—The National Science Foundation (NSF) has been trying to jump-start a revolution in science education, urging science faculty to pay more attention to teaching the vast majority of students who won't go on to become scientists themselves (*Science*, 19 April, p. 345). One institution that has taken NSF's admonishments—and its financial support—to heart is Northeastern University, which is about to implement sweeping curriculum reforms intended to integrate science with other disciplines. Northeastern's new program, called Academic Common Experience, or ACE, is an attempt to force students' major departments to provide a well-rounded education, a goal that will lead to less course specialization and more interdepartmental connections.

Launched just this autumn, ACE is still embryonic, and some worry that the university won't provide faculty members with the extra time and money they will need to implement it. But educators around the country give it high marks, and other universities are already looking to Northeastern's experiment as a possible model for their own curriculum overhauls. "Higher learning shouldn't be a collection of disjoint boxes," says mathematician Melvin George, interim president of the University of Missouri and chair of an NSF advisory panel that produced a report this spring urging such reforms. "Our education system has to help students make the connections" among disciplines, says George, adding that he is "very much in favor" of Northeastern's approach.

Northeastern is well known for its cooperative education programs, in which students alternate courses with paid professional work. But university officials admit that in the past, the school's seven specialized undergraduate colleges—which range from nursing to liberal arts and have no common curriculum—haven't fostered interdisciplinary connections. Students major in one field and must choose a mere handful of classes out of hundreds that can fulfill "general education" requirements. As at most schools, science and engineering courses cover only content, leaving communication skills, critical thinking, and the social context of science to other departments, says Gerard Voland, a professor of industrial engineering. The result: science graduates unable to communicate clearly and liberal arts graduates without a basic understanding of the sciences. That is just the situation NSF lamented in its report.

GRAHAM RAMSAY/NORTHEASTERN UNIV.

ACE in the whole. Northeastern engineer Gerard Voland leads discussions of ethics and history.

But under the new plan, which will be phased in over 6 years, topics Northeastern students once encountered only as part of their "general education" courses will be revisited and reinforced in their major courses. Music and dance courses, for example, will include units on the physics of sound, motion, and light, while political science courses will include Internet-based tasks to enhance students' "information literacy." Northeastern's science, math, and engineering departments are implementing their portions of ACE with the help of a $200,000 grant awarded this summer as part of a new NSF program on institution-wide science education reform.

ACE arose when the school tried to define a core liberal-arts curriculum. Its first attempt collapsed amid faculty disagreement, but in 1992, an informal group of faculty members and administrators revived the issue by focusing not on existing courses but on the broader question of what students need to know. The result, 3 years later, was faculty, administration, and even student consensus on a list of goals for undergraduate education, including not just course content but thinking and communication skills, technological literacy, and historical and aesthetic perspectives.

ACE puts chief responsibility for reaching these goals on the major departments, requiring each to assess its curriculum for weaknesses, choose an initial goal, and devise a way to assess success. The geology department, for example, knew from discussions with employers that its graduates had weak writing skills, so its first task under ACE will be to integrate more technical writing into its courses.

To achieve ACE goals, faculty members are beginning to collaborate across department boundaries to develop interdisciplinary teaching "modules." Physicists, for example, are working with health sciences faculty members to develop a sequence of biomedical physics courses. And Voland helped design assignments in fall-quarter freshman English and calculus courses to help prepare students for a spring-quarter engineering course, in which they will design and present solutions to real-world problems such as unexploded land mines and tropospheric ozone pollution.

All this adds to teaching workloads and course-development budgets, and some Northeastern faculty members fear that "the university wants to take credit for these initiatives, but when it comes to funding them, they aren't willing to do it [fully]," in the words of one science professor who asked not to be named. But students seem to like the idea. "With ACE, the student is at the center of learning, instead of the material," says Herby Duverné, the Northeastern student government's vice president for academic affairs.

Officials at other schools say they are keeping an eye on the changes at Northeastern and elsewhere as they develop their own reforms. "Our old gen-ed systems were not about learning; they were about administrative ease," says Ralph Mullin, a professor of management at Central Missouri State University, where similar reforms are under way. "Passing courses and getting a sheepskin shouldn't be the goal of an undergraduate education."

–Wade Roush