dential Fellows, 30 of whom were funded this year.)

The recommended five-year fellowships, together with a call for better funding for graduate students on the model of US teaching assistanships, would seem to reflect the view of Atiyah that career structure and morale were probably the most urgent matters facing the committee. In a conversation with PHYSICS TODAY held in his office at the Royal Society last February, Atiyah said it was his impression that brain drain—mainly to the US—was a problem above all among relatively junior researchers, where the problem is least visible.

In another conversation held around that time with the head of the condensed matter group at the University of Cambridge, Volker Heine, PHYSICS TODAY learned that junior researchers in the UK were increasingly reluctant to leave top institutions like Cambridge for anyplace else and that second-tier British universities were having greater difficulty attracting young faculty. Enderby told us that the study group would like to see more talented young researchers taking jobs at the "less fashionable" institutions.

Demographics and funding

The report says that between 1977–78 and 1990–91, short-term researchers in science and engineering disciplines at universities increased by 6000, "rising from 22% to 44% of total academic staff in these disciplines." At the same time, "there was a loss of over 1100 permanent science and engineering posts in universities between 1979–80 (the peak year) and 1989–90," though "nearly 300 posts were restored in 1990–91."

Total spending by the British government on R&D declined slightly between 1981 and 1991, and as a proportion of gross domestic product government-supported R&D fell from 1.33% to 0.87%. Compared to the other major countries in Europe, Britain still ranks fairly well: Its total spending on R&D as a percentage of national product is about the same as France's and considerably higher than Italy's, though not nearly as high as Germany's. Among the major European countries, however, the UK was "the only country to record a real-terms cut in absolute volume of government expenditure on R&D" during the most recent five-year period for which comparative data are available (1985–89), the report notes. Moreover, military R&D accounts for a much higher proportion of total research in Britain than in any other European country.

Together with other data (not presented in the report) suggesting a decline in the productivity of British scientists and in the impact of their work, the picture of British science that emerges in the science base report is indeed somewhat disquieting. But not all is doom and gloom. According to the report, industry funding of R&D has increased roughly 50% in Britain since 1981—a performance that surely will be the envy of many other countries, where the norm in recent years has been for industrial support to decline.

The report takes, however, a rather dim view of substituting nongovernmental for governmental funds: "Science base institutions should welcome external funding, which demonstrates the wider recognition of the value of their work; but such funding should not replace government funding to the extent that it distorts their long-term mission." The report associates the growth in nongovernmental support with the increase of short-term contract staff, and it says that "industrial funding of science base research is inherently vulnerable to fluctuations in the economic situation." Therefore "using public funds to lever private funds is more constructive than cutting public funds in the hope of coercing private funds."

European context

To put the Royal Society's report in some perspective, it bears noting that comparative evaluation of science is very much the rage throughout Europe. About this time last year France's science observatory issued its first volume of science indicators (see PHYSICS TODAY, December 1991, page 59), and more recently a national evaluation committee issued a report that is sharply critical of the country's space science program, especially the Hermes manned space shuttle. Germany's Science Council spent 1991 doing a detailed evaluation of every significant science institution in the five new states.

In spring 1991 Sweden's Natural Science Research Council convened an international panel to review Swedish physics. The panel recommended creation of a central board to organize and finance the country's large accelerator and storage ring facilities and drew attention to what it called "an extreme pyramidal situation" with regard to the country's career structure. It said that Sweden's system "denies permanent positions too long to those who deserve them and at the same time overloads the permanent persons with so many administrative responsibilities that the teaching is neglected by loading it onto a few." The panel recommended creation of tenure-track faculty positions on the US model.

According to Peter Collins, the head of the science policy research section at the Royal Society, there has been no official reaction to the British science base report as yet, but none was expected. OST is preparing a white paper on science funding, which is to be released by next spring. The science base report and comments on it will be inputs for the OST report.

As for more informal comment, Collins says that the recommended five-year fellowships received the most attention in the British press. Collins said that a typical British physicist enters the university at 18, gets a degree in three years and a PhD in another three, so that the doctorate is in hand by age 25. "In the halcyon good old days, you'd land a faculty position after a postdoc or two. But now chances have taken a nosedive, and so you have a lot of disspirited people. There's a clear recognition now that a PhD is not necessarily a ticket to a lifetime research career. In fact, for a majority it's not."

—WILLIAM SWEET

1992–93 CONGRESSIONAL FELLOWS NAMED BY AIP, APS AND AGU

The American Institute of Physics, the American Physical Society and the American Geophysical Union have selected a new group of physical scientists to spend a year working in Washington, DC. The Congressional Science Fellows for 1992-93 are Mark Goodman (AIP), Laurie Fathe (APS) and Valerie Lang (AGU). Lang and Goodman began their terms in September; Fathe will begin in January.

In September the new fellows attended a two-and-a-half-week orientation organized by the American Association for the Advancement of Science for 28 incoming fellows from about 20 scientific societies. They got an overview of the political process and met with some of the key science policy staff members. After the orientation, they interviewed for positions in Congressional offices and committees.

The new AIP fellow, Goodman, is working in the office of Kent Conrad, a Senate Democrat from North Dako-

ta who sits on the Energy and Natural Resources Committee. With a new Administration and several important environmental acts up for reauthorization—including the Clean Water, Endangered Species, and Resource Conservation and Recycling Acts—Goodman says, "Whatever I work on, it's bound to be interesting and there's bound to be a lot of it."

Changing careers

A theoretical physicist by education and training, Goodman now plans to make a career in science and public policy. In 1990 he became a research fellow at Harvard University's Center for Science and International Affairs, where he was involved in studies of military and space technology policy. Prior to that he held postdoctoral fellowships at the University of California, Santa Barbara, from 1986 to 1988 and then at Rutgers University from 1988 to 1990. His scientific research was primarily in elementary particles and superstrings.

After earning a BA in physics and mathematics from Brown University in 1981, Goodman did his graduate work at Princeton, where he received an MA in physics in 1983 and a PhD in physics in 1986.

The 1991–92 AIP fellow is Rosalyn B. Ritts, whose term ends in March. She has been working for the House Committee on Science, Space and Technology. Her primary responsibility has been to work with the committee's task force on the national laboratories, which has been looking into new nondefense roles for the Department of Energy's weapons labs—Lawrence Livermore, Sandia and Los Alamos. Ritts, whose background is in electrical engineering, says one of the most important changes going on in Washington relates to science funding. "There's a lot of rethinking about the way we fund science and technology research, which will have a profound effect on the universities and the science community," Ritts says. "It's going to be hard for a lot of basic scientists, and particularly physicists, to make that transition." (For further information on the 1991–92 Congressional science fellows, see PHYSICS TODAY, September 1991, page 76.)

Fathe, the new APS fellow, is an assistant professor of physics at Occidental College in Los Angeles and a researcher at the University of Southern California's Center for Laser Studies. She was prompted to become a fellow in part because she believes scientists should be more politically aware and active. She was also motivated by her concern that "women aren't well represented in the upper echelons of either the government or the scientific community." As a fellow, Fathe says, she'd like to work to change that.

Fathe earned a BS in physics from Miami University in 1979, an MS in physics from the University of Illinois in 1981 and a PhD in electrical engineering from the University of Southern California in 1989. Her research involves the study of new materials for use in near- to mid-infrared solid-state lasers. Fathe is a member of the Los Angeles chapter of the Sierra Club, and she now serves on the chapter's executive committee and board of trustees.

The 1991–92 APS fellows were Peter Saundry—who is married to incoming fellow Fathe—and Tina Kaarsberg.

Resisting temptation

Saundry, whose term ended on 31 August, spent the year working on the Senate Appropriations Subcommittee for Veterans' Affairs, Housing and Urban Development, and Independent Agencies under Barbara Mikulski, a Democrat from Maryland. Saundry found himself working on "everything from the American Battle Monuments Commission to the Hawaiian Telescope." Central to his work was the appropriations bill for NSF and NASA, and he also worked on a bill to establish a program for environmental technologies that would be similar to the National Institute of Standards and Technology's Advanced Technology Program. One of the greatest challenges for Saundry was keeping his scientist's curiosity in check. "Last May I was dealing with an issue related to x-ray lithography," Saundry said. "There's a lot of good physics there, and I had to fight very hard to stop myself from getting too far into the science of it. Time on the Hill does not allow that kind of depth."

Saundry is now a consultant with a nonprofit group called the Committee for National Institutes for the Environment, which supports the establishment of an environmental science agency along the lines of the National Institutes of Health.

Kaarsberg has been working for Senator Pete Domenici, a Republican from New Mexico. She served as Domenici's staff representative to two Senate observer groups, one on the Climate Treaty and the other on the Earth Summit. She also helped organize a proposed study conference for members of Congress interested in science and technology issues. Kaarsberg followed various DOE programs at Sandia and Los Alamos National Labs; one of the proposed programs would upgrade the Los Alamos Meson Physics Facility so that it could also serve as the driver of a next-generation neutron spallation source. Such a facility could be used in materials science and structural biology research.

Guarding environment

Lang, the AGU fellow, comes to Washington from California, where she is a member of the technical staff at the Aerospace Corporation in El Segundo. Lang says more scientists need to get involved in the actual writing of environmental legislation, because "the technical details often affect the industrial or government research sectors." In mid-October, she began working for the Senate Committee on Environment and Public Works, whose chair is Democrat Patrick Moynihan of New York. During the next year she expects to work on issues related to global environmental change. "My first challenge on the job has been to convince the staff that we should be connected to the 'outside' scientific community via electronic mail," Lang says.

Lang earned a BS from McGill University in 1979, an MS from the University of Miami in 1982 and a PhD in physical chemistry from Dartmouth College in 1986. She was a National Research Council resident research associate at the Jet Propulsion Lab from 1986 to 1988, after which she joined Aerospace. Her work at JPL and Aerospace has mainly involved experimental atmospheric chemistry related to ozone depletion and space launch vehicle fuels.

The previous AGU fellow was Vivian Pan, who spent the year working for the Senate Committee on Governmental Affairs, whose chair is John Glenn, Democrat of Ohio. The committee oversees the efficiency and effectiveness of governmental practices, and while there Pan worked on projects related to environment, energy and science education. One of her responsibilities was monitoring the Administration's national science education reform initiative.

Pan found her fellow Congressional fellows to be good resources; for example, she and Saundry worked together in planning a government affairs committee hearing on environmental technology legislation that Senator Mikulski had introduced. Overall, Pan says, "the Congressional Science Fellowship Program seems to be having a positive effect on science and technology policy-making on Capitol Hill."

—JEAN KUMAGAI