

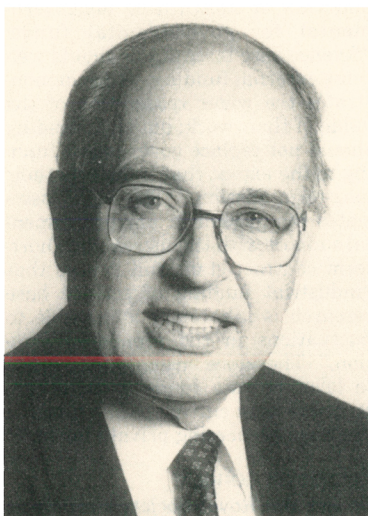
ROYAL SOCIETY REPORTS ON 'SCIENCE BASE,' SUGGESTS FIVE-YEAR FELLOWSHIPS

At the beginning of October Britain's Royal Society released its long awaited report, "The Future of the Science Base," the product of an 18-month-long review of how the nation's basic research is organized and of the factors that might make it more successful. Because of the Royal Society's prestige and because of the wide and deep concern about the state of British science, the science base report has been treated with some respect in the UK. Its conclusions may also be of some interest to Americans, as many of the trends and dilemmas it identifies are found also in the US.

Originally expected to be released shortly after Britain's national election last spring, the report may have been delayed partly because the newly reelected Conservative government preempted what almost certainly would have been one of the Royal Society's major recommendations. That is, Prime Minister John Major gave science and technology policy Cabinet-level representation and created an Office of Science and Technology (see PHYSICS TODAY, July, page 60).

Considering the degree of alarm within British science and the proliferation in recent years of radical proposals for reform, the Royal Society's major recommendations are remarkably conservative, in the literal sense of the word. The report strongly endorses preservation of the current "dual support" system, whereby institutions of higher education receive block grants from "funding councils" to provide for overhead and researchers obtain project funding from the "research councils." The report calls for continued broad distribution of research funds, continued close association of research with teaching and continued emphasis on awarding grants by "purely scientific criteria in the responsive mode."

The general strategy of the report is to make rather specific suggestions that stand a realistic chance of being adopted. Thus, in light of the estab-



Michael Atiyah

lishment of OST and the designation of the Chancellor of the Duchy of Lancaster as science's Cabinet spokesman, the report recommends strengthening and broadening the government's central science advisory apparatus.

Specific recommendations

The science base inquiry was conducted by a nine-member committee headed by Michael Atiyah, the eminent mathematician who currently serves as president of the Royal Society, head of the Isaac Newton Institute at the University of Cambridge and master of Cambridge's Trinity College. Physics was represented on the panel by John Enderby of the University of Bristol and astronomy by Arnold W. Wolfendale, the Astronomer Royal.

Immediately upon creation of OST last spring, the Royal Society pretty well made it known that its report would recommend giving OST a separate identifiable budget to meet payments to international facilities and programs, fund research activities transcending the responsibilities of

individual departments, and provide complementary funding for certain research projects supported by the European Community. The report draws attention to the fact that current procedures for allocating overhead in effect penalize researchers for obtaining EC grants, and it calls, by contrast, for provision of matching funds. The dedicated budget for international facilities and programs is designed, of course, to guarantee adequate funding for small science, to forestall further efforts to take Britain out of organizations like CERN and the European Space Agency, and to assure continued British participation in international telescope projects, synchrotron radiation and neutron-scattering facilities, and so on.

Enderby observes that those are the recommendations most obviously relevant to physics. But despite their evident importance and urgency, the funding and organization of science as well as European and international issues are given second billing in the report. "People" get priority, and under that heading, the most significant and novel recommendation is that special five-year research contracts should be set up for especially able young researchers ("high flyers") to bridge a yawning gap between postdoctoral work and the usual eligibility for tenured positions. "Able researchers, identified after one or two short-term contracts, should be rewarded by long-term support. Salary and research expenses guaranteed for at least five years, coupled with rigorous review, would be appropriate. They should be allowed to carry their resources to any approved academic institution," the report says.

The report recommends that funding for such fellowships, which are modeled on the Royal Society's University Research Fellowships, be increased two- or three-fold, so that 500-750 five-year fellowships would be available per year. (The closest US equivalent would seem to be the National Science Foundation's Presi-

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 assistantships, 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 dissipated 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 orien-

tation 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-