



SCHOPPER

rector of the Erice summer school and president of the European Physical Society. Rumors had been circulating that HERA, an electron-proton ring to be built at DESY, would compete with LEP, the large electron-positron ring CERN is planning to build in the hunt for the intermediate vector boson, Z^0 . The fears arose because the first of HERA's two stages would also be an electron-positron collider and may be completed years before LEP.

The Italians were also concerned that Schopper would have a conflict of interest coming to CERN from DESY, in that DESY, they thought, may have to compete with CERN for Germany's high-energy physics dollars in coming years.

The matter of a new director-general was raised at a December meeting of the Committee of Council. The Italians insisted that before a vote was taken, the Committee first discuss future scientific programs at CERN, especially as they related to national programs like HERA. Instead, the Committee held a vote on the nomination first, and the Italian delegation left the meeting and withdrew Zichichi's name from the ballot. "I didn't want to be director of a laboratory without a program," Zichichi told *PHYSICS TODAY*.

Although Italy's vote was not required to elect Schopper, the vote was postponed until February, when Schopper was called into the Committee. Schopper explained that, even during its e^+e^- stage, HERA will not operate at energies high enough to produce the intermediate vector boson, and therefore will not be competitive with LEP. Current expectation for the mass of the Z^0 is about 89 GeV. HERA will operate at only about 35 GeV on 35 GeV. Schopper also stated that LEP could be operational at a one-sixth stage with 16 MW of rf power (giving an

energy of 50 GeV in each beam), by 1986, much earlier than previous estimates had projected. In short, Schopper convinced the CERN delegates that, if made director-general, he would not be the "trojan horse" some had feared, and the vote taken at that meeting was unanimous in his favor.

Most observers agree that the trouble was concentrated in Italian political circles, not in the scientific circles, and some trace Italy's aggressiveness to its new minister for scientific research, Vito Scalia.

Although Scalia had at one point threatened to pull Italy out of active participation at CERN, it seems clear that there is no longer any real danger of that happening. CERN's winter tempest seems to have abated, and some even feel the controversy may have had a salutary effect, airing grievances and revealing strengths and weaknesses. —MEJ

Salam gives Nobel award to aid third-world scientists

Abdus Salam, one of the three winners of the 1979 Nobel Prize in physics (*PHYSICS TODAY*, December, page 17), has contributed his share of that prize to establish an international talent fund for young scientists from developing countries. Speaking before the UNESCO executive board, Salam cited the great disparity between the opportunities available to scientists of the developed "North" and scientists from Third World nations. At present, he noted, the International Centre for Theoretical Physics in Trieste, Italy, which Salam helped to establish in 1964 and which has a budget of \$1.5 million, is all that is available to physicists in 100 developing countries. "Compare this with European joint projects involving physics... [that are funded at] \$500 million annually. Somehow, somewhere, a break must come," he said.

Salam appealed to all nations of the world to work towards closing the gap, but he made a special appeal to the OPEC Islamic countries, whose "forebears were the torchbearers of international scientific research in the 8th, 9th, 10th and 11th centuries."

The fund proposed by Salam would provide for the education, through the doctoral level, of selected young science students from the developing world who demonstrate sufficient talent. "My humble contribution to this fund will be all I possess—the \$60 000 the Swedish Academy has so generously awarded me," Salam told the UNESCO gathering.

The community at Trieste has expressed support for the idea, but there has not yet been a response from other

individuals or countries. "If I fail in raising funds from other sources," Salam told *PHYSICS TODAY*, "I shall use my funds for a trust principally, though not exclusively, for my home district of Jhang in Pakistan."

NSF theory institute seeks suggestions for programs

The National Science Foundation's Institute for Theoretical Physics in Santa Barbara, California, is once again inviting the physics community to submit proposals for research programs. Proposals should be submitted as early as possible and no later than 1 August for programs that would last between six and eighteen months, beginning September 1981.

Criteria used in the selection process include conceptual and/or methodological significance, timeliness, relevance to experiments or observations, interdisciplinary character and availability of suitable leaders and participants. Recommendations should include references to these criteria, especially suggestions for possible leaders and senior participants, and should be addressed to Walter Kohn, Director, Institute for Theoretical Physics, University of California, Santa Barbara, California 93106.

Programs now underway or planned are: field theory—high-energy and condensed-matter physics; nuclear astrophysics; quantum gravity, valence fluctuations in solids; gauge field theories; the early universe; interactions of nuclei at medium and high energies, and nonequilibrium processes.

The institute also organizes workshops, meetings and summer research conferences.

Private sector takes the lead in R&D increase

National R&D spending levels have begun to advance following a long period of reduced support, according to *Science Indicators 1978*, the National Science Board's biennial assessment of the health of US science and technology. The report uses a variety of quantitative, mostly economic, measures of the operation of the scientific and technological enterprise.

Constant-dollar R&D expenditures increased at an average annual rate of approximately 3.5% between 1975 and 1979, compared to an average annual decline of 1.0% over the previous seven years. Increased private sector R&D investment is largely responsible for this overall increase, according to the report.

The Federal government, on the other hand, can claim most of the credit for

rising expenditures on basic and applied research after 1976. "The US government has explicitly adopted the idea that R&D is an investment in the future—not simply the purchase of a commodity—and therefore should receive appropriate support," the report states. Constant-dollar growth in applied research spending has risen more (20%) than spending on basic research over the last ten years. The report suggests that this apparent increased reliance on applied research may be a response to heightened concern about conducting research that may have relatively short-term economic and social benefits.

Total national expenditures for basic research have grown during the period from 1976 to 1979 in constant-dollar terms following a period of reduced spending between the late 1960's and mid-1970's. Beginning in 1976, constant-dollar basic research spending by industry, which accounted for approximately 16% of the total, has advanced slightly, following a period of declining support that began in the middle-to-late 1960's. "This relatively recent, modest growth is significant because it may signal the end of the longstanding trend of decreased industrial basic research activity," the NSB concluded.

Industrial R&D. The percentage of the total R&D dollar that is provided by industry has been rising steadily since 1975. "This return to previous high funding levels," according to the National Science Board, "should relieve some of the concern that has been expressed about a decline in industrial R&D."

The Federal government's constant-dollar support of industrial R&D also began to increase in 1976, after reaching in 1975 its lowest level since 1964. This was largely because of increased interest in energy and the space program, according to *Indicators*. "However, Federal support is not expected to return soon to the high levels of the 1960's."

Science Indicators also examined the decline in the total number of patents granted annually to US inventors from 1971 to 1977. Although the report attributes this decline to a decrease in new patents owned by US corporations, it cautions against drawing unwarranted conclusions. "One hypothesis is that there has been a decline in inventive activity in the US. However, it is thought by some that an increasing number of inventions are not being patented."

"It is possible that an increased emphasis by US industry on short-term payoff and cost-cutting research rather than on long-term basic research has led to more process rather than product innovations. Since it is generally be-

lieved that process inventions are less likely to be patented than new products, it is possible that this change in research emphasis has led to the increased use of trade secrets and decreased patenting activity in some industries." This tendency of companies to refrain from patenting their inventions makes patent counts a dubious measure of inventiveness, the report states. Overall, though, the NSB concluded that, because patenting has dropped in almost all product fields, the trends appear to indicate a real decline in the rate of production of inventions by US industry from 1971 to 1977.

Some analyses have used patenting by foreign countries in the US as a means for comparing their national technical efforts with our own. The proportion of foreign-origin patents to total US patents increased from 20% in 1966 to 36% in 1977. The increases in foreign patenting in the US were due largely to the increased patent activity of Japan and West Germany. But *Indicators* points out that foreign patent activity in the US is related both to increased foreign inventive activity and to interest in the US market.

Scientific manpower. As the economy recovered from a recession between 1974 and 1976, employment of scientists and engineers increased at a faster rate than total employment. In 1976, 16% of all physical scientists were employed in non-science jobs, and the most common single reason given was that they had been promoted out. Projections developed by the National Science Foundation and others indicate that the supply of physical scientists in most fields will be more than adequate to meet anticipated demands through the 1980's. And those scientists should be well qualified. "Questions have recently been raised concerning a decline in the quality of the S/E (scientist and engineer) work force... two related measures suggest that the quality of S/E's has not decreased: experienced S/E's continue an undiminished participation in training programs; and test scores for prospective S/E graduate students... remain high and unchanged..."

Copies of *Science Indicators 1978* may be purchased from the US Government Printing Office at \$6.00 per copy. The stock number is 038-000-00416-6. —MEJ

DOE and NSF are funding appropriate technology

The National Science Foundation and the Department of Energy have both offered grants to support appropriate technology, defined as technologies that are developed in consultation with people affected by them and chosen

from a range of alternatives after consideration of the local cultural, economic, social and environmental conditions.

The DOE's Region II, encompassing New York, New Jersey, Puerto Rico and the US Virgin Islands, has awarded grants of up to \$50 000 each. For more information, contact the Regional Program Manager, Appropriate Technology Small Grant Program, US Department of Energy, Region II, P.O. Box 1098, New York, N.Y. 10008.

For more information on the NSF appropriate technology grants, write to the Directorate for Engineering and Applied Science or the Directorate for Science Education, NSF, 1800 G Street, NW, Washington, D.C. 20550.

Carter establishes radiation policy council

President Carter has announced a series of initiatives to improve the protection of the public from unnecessary exposure to ionizing radiation from medical, occupational and environmental sources. His decision came after a year-long interagency analysis conducted by the Department of Health, Education and Welfare, the President's domestic policy staff, and the Office of Science and Technology Policy.

Reaffirming the Environmental Protection Agency as the agency with key responsibility for protecting the public from radiation, Carter established a Radiation Policy Council, to be chaired by the administrator of the EPA, to advise on radiation policy, coordinate Federal activities that use or control the use of radiation, resolve problems of jurisdiction, recommend legislation, and provide a forum for public input.

An Interagency Radiation Research Committee will also be set up to review the research needed and the quality of research in this area.

Joint US-German project for coal liquefaction

Secretary of Energy Charles Duncan and West German Minister of Research and Technology Volker Hauff have signed an agreement to share the costs of constructing the first coal liquefaction demonstration plant in the US. The West Germans have agreed to pay for one-fourth of the cost of the plant, which will be built in Morgantown, West Virginia. The current estimate of the total cost of the plant is \$1.4 billion. A similar agreement is now being negotiated with the Japanese. When completed in 1984, the Morgantown plant will convert 6000 tons of coal a day into the equivalent of 20 000 barrels of oil.