

PT: *It would seem that young physicists in Germany face uncertain prospects, with the size of the university system stabilizing, just as your baby boomlet generation of the early 1960s enters the labor force.*

HR: It is to be hoped that physicists, after their graduate or post-graduate studies, will first gather experience in the demanding research and development work of a national research center, for example, and then contribute their enriched knowledge to the more practical industrial activities. BMFT [the Science Ministry] has set up programs intended to promote cooperation between research institutions and industry and to facilitate the transfer of personnel to industry and independent entrepreneurial activities. All in all, compared with other countries, conditions for young physicists in the Federal Republic of Germany are not bad.

CERN, Grenoble

PT: *As we go to press, it is rumored that England's Kendrew Commission, which was set up to evaluate British spending on particle physics, will recommend substantial reductions in European funding for CERN. What is your position?*

HR: For many years now, the Federal Republic has advocated an economical and efficient use of funds at CERN. After intensive discussions, the Large Electron Positron storage ring (lep) was adopted in a markedly reduced form. Most of the budget of CERN will be tied up in the construction of this large facility until the end of this decade. For the time after that, I expect a reduction in real terms of CERN's contribution income in response to reduced demand for investment, a long-term reduction of staff, the full exploitation of possibilities for rationalization, and further technological progress with regard to new accelerators, experimental facilities and auxiliary units (for example mainframe computers). I consider it particularly important to reach worldwide harmonization regarding the construction of new large-scale equipment for particle research in the 1990s and later on to permit the optimum use of research funds, which are scarce in all countries.

PT: *We also are hearing rumors that some of the smaller European countries may pull out of the project to build a European Synchrotron Radiation Facility because of dissatisfaction with the selection of Grenoble as the site (see PHYSICS TODAY, May, page 19).*

HR: Preparations for the facility have involved the strong participation of a large number of European scientists, with the European Science Foundation providing coordination. I would consider it highly unfortunate if the small

number of countries which have so far been in favor of the proposed location at Grenoble were to go it alone. From the beginning we wanted to enable small countries to make use of the excellent research possibilities offered by such equipment. I agreed with my French colleague, Science Minister Hubert Curien, on his choice of location, and there is no reason to revise my position.

'Star Wars,' plutonium

PT: *Would you comment on what technologies German scientists might find worth pursuing if your government were to decide in favor of participating in the Star Wars research program?*

HR: We are now in a discussion process which has not yet come to an end. What SDI stands for and where cooperation with our American and European partners would be best suited has still to be examined. Financing is also a question to be settled. The same applies to the US, where the subject has been under discussion for more than two years now. We need more time for information and reflection.

In his government declaration of 18 April, the Chancellor stated that we were going to support this program in principle. It is of major importance to develop a defense system that also is suited to ward off arms specifically directed at Western Europe. Then it has to be clarified whether we will be mere subcontractors for the US or whether we will be equal partners contributing whole systems developed and constructed in the Federal Republic, for in my view a fair partnership means an exchange of knowledge and technology among equal partners. However, I am quite confident that a free exchange of knowledge and technology in the Western world will be preserved. At any rate, the German and American governments have issued policy statements clearly advocating an unhampered flow of knowledge and scientific findings.

PT: *During the Carter years, differences*

Education

Physics department chairmen meet again

On 17-18 May, some 250 chairmen of physics departments met in Washington to discuss education for professional work in physics. This was the second such Conference of Department Chairs in Physics, the first having taken place two years earlier in Washington. The American Association of Physics Teachers and The American Physical Society were the conference sponsors.

Featured speakers at this year's conference included a spokesperson for Rep. Don Fuqua, chairman of the

of opinion over plutonium policy were a major irritant in US-German relations. Carter terminated commercial reprocessing and fast-breeder reactor development, saying he wanted to set an example. He also tried to get the German government to cancel the sale of sensitive nuclear technologies to Brazil. What is your assessment of the situation now?

HR: It has become clear that the internationally accepted safeguards system initiated by the International Atomic Energy Agency is an instrument precluding abuse of peaceful nuclear technology with the aim of nuclear weapons production. It is a noncontroversial fact among all partners of the Non-Proliferation Treaty that nuclear energy should everywhere be used under international control to an extent corresponding to national needs.

The enrichment plant in Resende near Rio de Janeiro is a pilot project designed for the testing of the new separation jet technology, and it is not suited for the production of large quantities of enriched uranium. Furthermore, this technology is not suited for enriching uranium to more than 20%. At present, there are no plans for building a reprocessing plant in Brazil; they have been suspended for economic reasons.

Plans for an integrated radioactive waste management center in Germany have been abandoned because projections of a major increase in energy use have proved to be unrealistic. Instead the responsibility for building waste treatment and reprocessing complexes has been divided among state governments.

As for fast breeder reactors, the SNR 300 is being built, and commissioning is underway. Soon German and European utilities will award a planning contract for SNR-II, in a way the counterpart of the Superphénix. The Superphénix at Creys-Malville is being constructed and operated by the French NERSA, in which SBK [a German-Belgian-Dutch utility] has a share of 16%.

House Committee on Science and Technology; William F. Brinkman of Sandia Corporation; Roland W. Schmitt of General Electric; Dale R. Corson, president emeritus of Cornell; and Robert Resnick of Rensselaer Polytechnic Institute. Resnick presented the results of a survey of department chairmen on how student interest in physics is affected by course offerings and program design. The survey was sponsored by the APS Education Committee and done in cooperation with AAPT.

In the feature presentations and in many of the workshops, there was a good deal of worrying over low enrollments in physics, the relatively advanced median ages of tenured physics professors, and the problems facing small departments and departments in four-year colleges. In reporting the results of workshop discussions, groups gave high priority to restoring programs of Federal support for participation by undergraduates in physics research. They also recommended tak-

ing steps to attract college students to careers in high-school physics teaching, preparing sample guidelines for evaluation or accreditation of undergraduate physics programs, and assisting graduate students find jobs by providing better information and counseling.

In the final wrap-up talk, Harvard's Norman Ramsey, who is chairman of the AIP Governing Board, suggested that universities consider temporarily expanding the number of tenured positions in physics departments, so as to

provide slots for younger physicists now, on the understanding that departments would revert to their current size when older members retire.

At a dinner midway through the conference, Anthony P. French, president of AAPT, gave a talk entitled "Discovering Niels Bohr." French is the editor of a forthcoming centenary volume about Bohr's life and work, which is sponsored by the Education Commission of the International Union of Pure and Applied Physics.

APS human rights committee works on Soviet cases, Poland

The American Physical Society's Committee on the International Freedom of Scientists was represented last March at a reception held by AAAS at the American Museum of Natural History in New York for Argentina's president Raúl Alfonsín. For President Alfonsín, the AAAS reception was an opportunity, among other things, to urge Argentine expatriates to support the reconstruction of scientific research and science education in Argentina, which suffered badly under Peronist and military rule. It also was an opportunity for him to thank US scientists for speaking out on behalf of individuals who had been jailed, tortured or "disappeared" during his country's dark years.

The APS Committee on the International Freedom of Scientists is of course just one of many groups that have dedicated themselves to the difficult task of trying to protect victims of political abuse. Organizations such as Amnesty International, Helsinki Watch and the Committee of Concerned Scientists are much better known to the general public; even among most physicists, CIFS probably is not a household acronym.

Earlier this year, Thomas H. Stix, professor of astrophysical sciences at Princeton and associate director for academic affairs at the Princeton Plasma Physics Laboratory, took over as chairman of the committee. The views of Stix are described in the box page 73, and the work of the Committee on the International Freedom of Scientists is the subject of this story.

Small Committees. Like most human rights groups, CIFS concentrates almost exclusively on individual persons and does not generally address cases of discrimination against classes or groups of people. CIFS works mainly through "Small Committees"—teams of three or four people who take it upon themselves to correspond with victims of political abuse, their friends, associates and families, local authorities, and people who are in a position to intervene.

In recent years, CIFS has intervened on behalf of physicists in Argentina and Chile, it has worked with Amnesty International to protect the rights of Palestinian physicists in Israel, lodged protests with the Indian government against discriminatory treatment of Israeli physicists (see *PHYSICS TODAY*, September 1981, page 54), and taken up an investigation of Turkish physicists who were dismissed from teaching posts under the military regime. Currently, however, nearly all the individual cases handled by CIFS are in the Soviet Union, with a few in Poland. While the preponderance of Soviet cases is somewhat embarrassing to the committee, CIFS takes pains to say that this is simply the way the chips happen to have fallen.

"Because the Soviet Union imposes its repressive regime on so large a scientific community," CIFS said in its 1984 annual report, "the committee's efforts on behalf of human rights have been occupied very largely with the problems of Soviet scientists. CIFS does not wish its pro-human rights efforts to be mistakenly labeled as anti-Soviet; CIFS seriously entertains any reports of physicist human rights violations anywhere..." (For full text, see *APS Bulletin*, June, page 1068.)

CIFS small committees currently are working on nearly 70 Soviet cases, and according to committee chairman Stix, all the cases are either refuseniks (Jews who have applied to emigrate) or dissidents (persons who publicly take issue with Soviet policy). Except for those who fall into one of these two categories, physicists generally are treated quite well by comparison with some other groups in the Soviet Union, and human rights activists have little or no evidence that physicists have been victims of the kind of pervasive discrimination that Jewish mathematicians are reported to have suffered from during the past 15 years.

The comparison with mathematics is instructive. According to *samizdat* (underground) documents that are generally considered well-founded in fact,

it became virtually impossible during the 1970s for Jewish mathematicians in Russia (of whom there are a large number) to publish in some of the leading journals and get promoted at the top universities. Prominent Jewish mathematicians also found it increasingly difficult to go abroad to attend professional conferences and accept awards. Furthermore, it recently has become difficult for Jewish students in mathematics—and Jews in physics and other fields as well—to attend Moscow University.

Soviet focus. Reports indicate that the situation of Jewish mathematicians in the Soviet Union may be improving, and by comparison with Soviet physicists, the mathematicians always have found it somewhat easier to emigrate. According to Joel Lebowitz, a mathematical physicist at Rutgers and co-chairman of the Committee of Concerned Scientists, there are two reasons for this contrast. In the first place, mathematicians have suffered discrimination at the hands of anti-Semites within the mathematical establishment—persons in positions of administrative power—who have been only too happy to let Jews go when they apply for permission to emigrate. Second, the political authorities have not considered mathematics nearly as vital to national security as physics. If a physicist wants to leave the Soviet Union, the answer is almost sure to be that the person cannot be dispensed with because of national security, and if a physicist expresses dissent, the official attitude is that a sacred national trust has been betrayed.

Members of CIFS naturally are concerned, at a time when scientific exchanges and arms-control negotiations are being resumed with the Soviet Union, that so little progress has been made on human rights. For a time it seemed that Yuri Orlov's condition was improving, and CIFS members felt they may have played some role in gaining his release from prison. But the most recent reports indicate that he is being forced to live in quarters for transient