

age was 38. Seventy-nine PhD's were hired, with an average age of 30. Except in postdoctoral-type jobs, the younger physicist did not displace an older physicist in any direct fashion, Grodzins says. In one lab, for example, new physicists were hired for a large project where there was a long-term commitment; at the same time, because of a decrease in the lab's overall budget, it essentially closed down an entire program in a completely different subfield of physics. Of the 100 who left, 45 left the country, left physics, were unemployed or their status was unknown. (Most of the latter were unemployed when they left the labs.)

What of the future? For the next few years, Grodzins says, there will continue to be a severe imbalance between the training and aspirations of

the students and the opportunities that will exist. In 1970 about 23% of the new PhD's specialized in particle physics and 20% in nuclear physics. Neither field has grown significantly in the past few years, but because of the new particle accelerators throughout the US, it will be difficult to stem their flow: The number of graduate students now in the pipeline for particle physics will sustain the output for several years. But at least 75% of them will have to find jobs outside the field.

Grodzins believes that during the 1970's physics faculties will probably need no more than 300-500 new PhD's per year. Forty percent of the PhD's are on faculties. If the other kinds of jobs grow at the same rate, only 800-1200 new PhD's per year will be needed. Taking attrition into account, the need

will be no greater than 1400 PhD's per year, he estimates.

What can we do? For the near future Grodzins feels we must find new opportunities for physicists, such as jobs in hospitals, as science advisers to secondary-school systems, in junior colleges, and working on societal needs. Grodzins says we ought to reduce the self-interest pressures that sustain the flow of students into graduate school. One temporary solution is to reduce the number of graduate assistantships, putting the money saved into postdoctorate positions. (The latest version of this scheme is known as the "Arden House Proposal.") Standards for the PhD should be tightened, and the PhD program should not train the physicist only for the kind of career for which few opportunities exist. —GBL

Budget office seeks guidance on science problems

The Office of Management and Budget has a strong disposition to support science and technology, according to William D. Carey, formerly assistant director of the old Bureau of the Budget, now the OMB. (Carey is now senior staff consultant at Arthur D. Little Inc). Speaking to a seminar on science and public policy held at the National Academy of Sciences 22-24 February, and sponsored by the Council for the Advancement of Science Writing, Carey, who was with the BOB for 26 years, said that the OMB regards itself as a friend of science, despite the contrary opinion of many scientists. Over the years BOB repeatedly asked the scientific community for guidance on scientific priorities, he said, but to no avail. OMB is still looking for such criteria of choice.

The OMB view of NSF has changed, he said, and NSF is being led closer to hard problems in the market place, with the emphasis on applied research. In the past, he noted, there was a revulsion towards tainting the NSF with any applied research.

Last year there were oft-repeated rumors that the Office of Science and Technology had been shut out of the final stages of the budget preparation. Carey confirmed the truth of the rumor. In the old days the director's review in the BOB would be attended by many interested parties. Then this open meeting became a closed one, and OST did not participate. Now OST and OMB have become friends again.

At the same meeting Congressman Edward Boland (D-Mass.) pointed out that the Subcommittee on Independent Offices and Housing and Urban Development (Appropriations), whose chairmanship he just assumed, is responsible for considering the NSF budget. After the House Science and As-

tronautics Committee has authorized a budget, it is Boland's subcommittee that recommends the appropriation. Their recommendation is never for more money than has been authorized, frequently for less. Boland said that in his judgment the NSF budget will increase substantially. He noted that because of the Mansfield amendment there is a tendency to shift mission-agency research to NSF.

Presidential Science Adviser Edward E. David Jr, in his remarks to the meet-

ing, said that he feels the most serious problem facing the nation "is the increasing alienation of people in our society from rational ways of thought." He said that society is losing the courage to experiment. As an example, he insisted that we must "build those experimental supersonic vehicles which will lead us to understand whether or not supersonic travel is feasible. Make no mistake, a limitation on experimentation in whatever cause is the beginning of a wider suppression." GBL

CERN II begins at last with support from ten nations

After considerable behind-the-scenes maneuvering, CERN will at last get its 300-GeV accelerator. At a Council meeting on 19 February three nations (Netherlands, Norway and Sweden) that had held back from a final decision declared their approval; so now ten countries will be participating. The total cost of the eight-year construction program will be 1150 million Swiss francs (at 1970 prices), and the 1971 budget will be 29.3 million Swiss francs.

CERN expects to start immediately recruiting heads of design and construction groups so that site work can

begin this summer. Research is scheduled to begin in 1976. The 300-GeV laboratory, to be known as "CERN II," has John B. Adams as Director General. Willibald Jentschke is Director General of CERN I. When the new accelerator is completed the programs of both laboratories will be united under the direction of a single Director General.

The cost of the program is to be shared as follows: Austria 2.01%, Belgium 3.88%, France 20.48%, Federal Republic of Germany 23.96%, Italy 13.27%, Netherlands 4.56%, Norway 1.57%, Sweden 4.72%, Switzerland 3.30%, United Kingdom 22.25%.

KMS Industries will do classified fusion research

The Atomic Energy Commission has given permission to KMS Industries, Inc to conduct research at its own expense on a controlled-fusion idea, but will require that the work be classified because of its potential weapons applications. This appears to be the first time a private firm has been allowed by

AEC to work on a device that is potentially explosive. The idea would use a high-power short-pulse laser to irradiate pellets of thermonuclear material, heating them to thermonuclear temperatures very rapidly, and possibly lead to a controlled release of thermonuclear energy.

Theorist Keith Brueckner (University of California at La Jolla) had filed nine patent applications in connection with the work, which was done at the KMS Technology Center while he was technical director (*physics today*, August 1970, page 47). AEC said, in a prepared statement, that because Brueckner had been closely associated with classified work in AEC weapons laboratories and had signed the usual AEC patent agreements in connection with the work, AEC would contest any Patent Office decision to issue patents on some or all of the claims made in his applications.

Keeve M. Siegel, chairman of KMS Industries, commenting on the AEC statement, said that arrangements for the substantial amounts of money needed for the program in the next few years have not been completed yet. The AEC statement also pointed out that "If, in the future, the AEC determined that the work was leading to the fabrication of a nuclear explosive device or a component of an explosive, the KMS program would be ended or redirected toward peaceful applications at the discretion of the Commission."

Physicists urged to respond promptly to NSF job survey

About 36 000 physicists are included in a National Science Foundation survey looking into the current science employment situation. Their names are drawn from among the 313 000 scientists who responded to the 1970 National Register questionnaire. Postcards were mailed in March to obtain data for this study, suggested to NSF by the Office of Science and Technology.

AIP director H. William Koch commented: "The survey is an important attempt to assess the unemployment picture in the sciences. Clearly the greater the response to the survey, the more useful will be the results. Physicists are urged to respond accurately and promptly."

Loans for scientists

continued from page 61

cation Bill is an updated version of the one first introduced by Kennedy last August. The conversion bill would authorize expenditure of \$500 million over a three-year period. The similar House version would authorize \$450 million. The goal of the bill is to convert scientists from defense- and space-related activities to those that will help solve urgent social problems, including crime, pollution, energy sources and natural resources, urban problems, housing, transportation, education and health care.

In the Kennedy version \$449 million would be administered by NSF, and \$225 million of this would go directly into conversion fellowships to individual scientists, engineers and technicians (and would include allowances for family support and relocation expenses). Another \$63 million would go towards establishing "community conversion corporations" in localities that are severely affected by defense and space cutbacks. An additional \$45 million would go to state and local governments to establish conversion planning and support programs at state,

local or regional levels. Besides the NSF programs, the Small Business Administration would get \$45 million for grants to small businesses to assist them in converting from defense efforts to other endeavors.

Giaimo, in introducing the House version, noted that unemployment among scientists and engineers is closely related to unemployment on the production line. He said that in converting them to solving the nation's domestic problems, the new technology they develop will create new jobs at all economic levels.

—GBL

the physics community

New committee formed to study materials science

A Committee on the Survey of Materials Science and Engineering (COSMAT) has been formed under the auspices of the Committee on Science and Public Policy of the National Academy of Sciences. The purpose of the new committee is to examine the nature and scope of the field of materials science in an effort to learn how science and engineering are linked in the development of new materials. COSMAT will investigate the translation of basic science into materials application as well as the interactions of materials science with other fields of science and technology, new trends in materials science and research requirements in the field. Much of the work will be interdisciplinary, as materials researchers include specialists in the biosciences, chemistry, engineering, metallurgy, physics and other areas.

The chairman of COSMAT is Morris Cohen, who is Ford Professor of Material Science and Engineering at MIT, and the vice-chairman is William O. Baker, vice-president for research at Bell Telephone Laboratories.

Committee is examining amorphous-materials studies

A new committee has been formed to give some shape to the study of amorphous materials—in particular, to develop a research program that will determine significant characteristics common to these materials and look for correlations between these characteristics and the behavior of the materials. This *ad hoc* "Committee to Study the Fundamentals of Amorphous Materials" was formed by the National Research Council's national materials advisory board at the request of the

Office of Naval Research. The chairman is Henry Ehrenreich of Harvard; the committee members are David Turnbull of Harvard, Bertrand Halperin of Bell Telephone Laboratories, Rolf Landauer of IBM, Hans Frederikse of the National Bureau of Standards, Evan Felty of Xerox and John Tauc of Brown University.

Third competition announced for physics teaching films

Another competition for the best short 8-mm or "super 8" films made for physics education is being arranged by AAPT. This, the third such competition, will be conducted by AAPT's Committee on Visual Aids in conjunction with the January 1972 joint APS-AAPT meeting. Prize money totals \$700.

Entries from students or teachers who have made educational films (not in commercial production or distribution) must be submitted before the 1 December 1971 deadline.

Kenneth Weaver wins science-writing award

The award winner of the AIP-US Steel Foundation Science Writing Award to a journalist is Kenneth F. Weaver, an Assistant Editor of the *National Geographic Magazine*, for "Voyage to the Planets," which was published in the August 1970 issue of the magazine. The award, which was to be presented to Weaver during the Spring meeting of the Washington DC section of the National Association of Science Writers, consists of a \$1500 prize, a certificate to the author and to the publication and a trophy. Two AIP-US Steel Foundation Science Writing Awards are presented annually, to a journalist and to a scientist. □