

tary of Commerce on the efficiency of the Bureau's work, similarly noted that "there are confusing inconsistencies in the management direction NBS has received from the Department of Commerce and from OMB [the Office of Management and Budget]."

As an example, they remarked on the fate of the Energy Policy and Conservation Act of 1975, which required NBS, under the direction of the Federal Energy Administration, to develop methods for measuring the energy consumption of household appliances. OMB, after approving the Bureau's plans to carry out the mandated activities, withdrew funding for the legislation from FEA, from which it had instructed NBS to obtain the necessary funding.

Not surprisingly, both Ambler and Peck testified that morale has been weakened at NBS and that the Bureau is having difficulty recruiting top-notch graduating scientists. (NBS currently has over 350 physicists on its staff.) Ambler remarked that "the shifting of people to meet new requirements, and the erosion of basic scientific competence, has led to an uncertainty and frustration in parts of the organization that I have not seen before in my 24 years with NBS."

Ambler and his superiors at the Department of Commerce hope to relieve some of these problems by reorganizing NBS. As the reorganization plan is currently under review by Commerce officials, details concerning it are sketchy at present. In his testimony, however, Ambler did suggest that the technical program staff could be divided into two major groups: a National Measurement Laboratory that would be responsible for the national system of physical, chemical and materials measurement, and a National Engineering Laboratory that would be responsible for research, development and services allied to solving national problems in engineering and applied science. Ambler also suggested the formation of a National Center for Cooperative Technology for increasing the Bureau's involvement with industry, government and the universities.

These proposals appear to fall in line with the kind of reorganization that Jordan Baruch (Assistant Secretary for Science and Technology at the Department of Commerce) envisioned in his testimony—one that "will ensure the utilization of the Bureau's special skills and the productive collaboration of the private sector."

The review of the reorganization plan was expected to be completed by the end of December, and NBS expects to reveal further details about it during two days of oversight hearings to be held in February and March by the Senate Committee on Commerce, Science and Transportation.

Before then the same Senate committee will have held the confirmation hear-



AMBLER

ings on the nomination of Ambler, who began working for NBS in 1953 after receiving his PhD in physics from Oxford University. In 1956 he participated in a cooperative effort that disproved the law of parity conservation and thus confirmed the theoretical work of T. D. Lee and C. N. Yang.

At NBS he became Chief of the Cryogenics Physics Section in 1961, Chief of the Inorganic Materials Division in 1965, and Director of the Institute for Basic Standards in 1968. Five years later he was appointed Deputy Director, and he began serving as Acting Director upon the resignation of Richard W. Roberts in June 1975.

—CBW

Frank Press sees role in short-term plans

Presidential science adviser Frank Press recently described how his office has been affected under the recent Presidential reorganization plan. He spoke at the 50th anniversary celebration of the Pupin Physics Laboratories at Columbia University, held early in November.

The major effect of the reorganization is to bring the science adviser closer to short-term problems, making him an important part of major decision making, Press said. However, he feels that the shortcoming of the reorganization is his inability to examine issues "a few years down the road." He has asked professional and international organizations to assist him with these long-term issues. Before the reorganization, the White House Office of Science and Technology Policy, under Press's leadership, was to prepare an annual report on the state of science and technology and a five-year report as well. These duties are now to be the responsibility of the National Science Foundation, perhaps with the aid of the National Academy of Sciences.

When President Richard M. Nixon eliminated the post of Presidential science

adviser, he also did away with the President's Science Advisory Committee. Although Congress subsequently restored this committee under the name of the President's Committee on Science and Technology, it was disbanded by President Jimmy Carter under his reorganization plan. However, Press feels that the science advisory committee is not a dead issue. "I would like to raise it with the President again some time," he said.

The President is in the midst of deciding whether or not the US should make "a major thrust" in basic research, Press said. One approach for improving the health of basic research, Press said, is to establish research centers at our great universities, even though teaching responsibilities have diminished there.

—GBL

Azbel describes problems of refusniks

Refusnik physicist Mark Azbel recently spent five weeks in the US on a lecture tour, describing the difficulties scientists face in trying to leave the Soviet Union. At the same time, he told of his recent research in biophysics. Azbel is now professor of physics at Tel Aviv University.

Azbel, best known for his work on the Azbel-Kaner resonance in metals, was head of the Department of Electron Theory of Metals at the Landau Institute for Theoretical Physics in Moscow when he applied for permission to emigrate in 1972. His application came not long after that of Victor Brailovsky, Alexander Lerner and Benjamin Levich (who remain in Moscow) and Alexander Voronel (who left Moscow in 1974 for Tel Aviv University). In 1972 the refusnik scientists started the Moscow Seminar on Collective Phenomena, and two years later, Azbel became chairman of the group. In 1974 Azbel was briefly imprisoned, when the seminar tried to hold an international conference.

It is Soviet policy, Azbel told us, to make life as hard as possible for a scientist who applies for a visa. On the other hand, it is a Soviet tendency to improve the situation of those of his former colleagues who did not apply. For example, after Azbel applied, practically all his former colleagues were allowed to travel abroad, an unprecedented move.

Why was he finally allowed to migrate in July? Azbel believes it was because of the seminar's International Jubilee conference, held in April. Scientists such as George Wald and Alfred Kastler attempted to come but were not permitted by Soviet authorities. But 10 foreign scientists, many of them physicists, did make it to the meeting. Azbel feels that pressure from the West had convinced Soviet officials to allow the meeting to take place. And the attention the meet-

ing created made the authorities feel that he should either be arrested or released. They chose to let him go.

With Azbel in Israel, the Moscow seminar continues at Brailovsky's apartment. Azbel fears that Brailovsky is now in danger of imprisonment. A schedule for the weekly seminar is available from the Committee of Concerned Scientists, 9 East 40th St., New York, N.Y. 10016. (Azbel's US tour was sponsored by the Committee, The American Physical Society and the American Association for the Advancement of Science.)

Azbel's current research interest is in DNA sequencing. He has developed a theory according to which the DNA differential coiling curve explicitly determines the sequence and the nucleotide composition of certain segments within the DNA.

AIP Corporate Associates

continued from page 101

from research through development to the product. The emphasis is on interdisciplinary activities.

The American Physical Society, President George Pake said, has taken steps toward expanding the role of physicists in government and industry. APS initiated its Congressional Fellowship Program five years ago. The combined total of all Congressional fellows is already 50 scientists and engineers from several societies. He noted that in addition to APS, the Optical Society of America and the Acoustical Society of America have such programs. More recently APS started an Industrial Fellowship Program, awarding these fellowships last year to three physicists.

How has academia responded to declining job opportunities? Roland Good (Pennsylvania State University) said that about 40% of the physics departments have set up new applied courses, about 25% have revised PhD requirements, and that about 55% have increased their interaction with industry.

Two federally funded research and development laboratories were described—Argonne National Laboratory and Lawrence Livermore Laboratory. Robert Sachs noted that Argonne has had experience in the transfer of nuclear

power to industry. With the advent of the energy crisis, the laboratory has taken new directions. For example, Argonne had been doing advanced vehicle battery development. Once this development was far enough along, research and development has been carried out with battery firms. Another project has been on solar collectors; these devices, which grew out of work on Cerenkov counters, are now being developed in a partnership with industry.

Livermore, Richard F. Post said, recently celebrated its 25th anniversary. Although its primary mission is nuclear weapons, Livermore has a growing component of research on energy. The lab employs 6500 persons, 447 of them PhD physicists. Livermore is playing a leading role in both magnetic fusion and laser fusion. The \$100-million Mirror Fusion Test Facility, now approved, is scheduled to be completed in 1981. The Shiva laser fusion facility was expected to be operating by the end of 1977. Post said that the next stage, called Shiva Nova, is expected to demonstrate breakeven.

A broad range of energy options was discussed by Robert H. Cannon (California Institute of Technology). He feels that "with a problem this important the prudent thing is not to rely on one panacea or another, but to pursue every approach that can help—every means to conserve energy, every promising supply option, protection for every potential risk."

Solar energy research was described by Charles Grosskreutz (Solar Energy Research Institute). Opportunities for physicists in this field include: solid-state and semiconductor physics, properties of surfaces and thin films, innovative energy storage, systems analysis, optics, optical properties of materials, new photo and thermal conversion techniques.

Others speakers included Walter A. Hahn (Congressional Research Service) on US science and technology policy, Elliott W. Montroll (University of Rochester) "on the breadth of physicists' style of thought," Joseph Heiserman (Stanford University) on the acoustic scanning microscope, Laurence L. Rosier (IBM San Jose) on magnetic bubbles and Malcolm R. Beasley (Stanford) on energy-related

applications of superconductivity.

At the banquet AIP director H. William Koch presented the AIP-US Steel Foundation Science-Writing Award in Physics and Astronomy to Steven Weinberg (PHYSICS TODAY, October 1977, page 88). In the absence of Weinberg, who was ill, Sachs accepted the award for him. The banquet speaker was Andrew S. Grove (Intel Corp), whose topic was "Silicon Valley—Its Development and Growth." —GBL

Funding for chemistry computation center

The National Resource for Computation in Chemistry began operations in October at Lawrence Berkeley Laboratory. The facility, jointly funded by the Department of Energy and the National Science Foundation, has a first-year budget of \$1.3 million; this is projected to increase to \$2.4 million by 1980. Academic, industrial and government chemists from throughout the US who need access to advanced computer hardware and specialized software to solve research problems will be able to use the NRCC, which will make extensive use of LBL's existing computer center.

Basic research in chemical kinetics, crystallography, macromolecular science, nonnumerical methods, quantum chemistry, physical organic chemistry, statistical mechanics and energy systems will be undertaken at the facility. Earl K. Hyde, deputy director of LBL, predicts that the NRCC "should develop into a unique intellectual facility that will aid theoretical chemists from all over the US in frontier calculations which require the power and capacity of a modern computer center. It should make possible state-of-the-art computations that were not possible before."

A twelve-member Policy Board, which will determine the scientific goals and policies of the NRCC, was recently selected by representatives of LBL, DOE and NSF. It named James E. Ibers (Northwestern University) as its Chairman and appointed the LBL Deputy Director, Earl K. Hyde, to serve as Administrator of the NRCC until a permanent Director is selected by the Board.

the physics community

Miami's program to turn PhD's into MD's succeeds

PhD's in physical, biological and engineering science are studying for the MD degree in a special program conducted at the University of Miami School of Medicine. Based on the premise that well-

qualified individuals already holding a PhD can be educated in an accelerated curriculum, the program allows participants to earn the MD within 24 months.

Implemented in 1971, the innovative program attracted worldwide attention. The first year saw 20 students enrolled in the PhD-MD program from an applicant

pool of about 130. Four of the 20 possessed backgrounds in nonbiological science. The success of this latter group led to no further bias in favor of the biologically oriented scientist. As a result, the majority of admitted candidates have since been non-biologists, with over 25% being physicists.