

will have had five years of physics, five years of algebra, ten years of geometry, two years of calculus, four years of chemistry, one year of astronomy and five and one half years of biology.

This is in sharp contrast to the US, where math and science teaching reforms of the 1950's and 60's were designed to reach early those students heading for careers in science and provide them with accelerated programs. The result, as the US study points out, has been a neglect of science education for non-science majors. For example, virtually all five million graduates of Soviet secondary educational institutions in 1978 and 1979 had studied calculus for two years, while less than 5% of US high school students had taken one year of calculus.

The US study found another side to the coin, however: "There is little specific data, but informed US opinion is that there is widespread underemployment of the science and engineering work force in the Soviet Union." And furthermore, "A member of the Soviet science and engineering work force is trained almost for a specific job and usually remains with a particular institution for a whole career. This results in a system that, in the opinion of some, is very slow to rise to new specialties and has a reduced ability to innovate."

Remedies. The report outlines a number of strategies that it says can

help the educational system, starting at the primary level, including the development of curricula for students who are not interested in professional scientific and engineering careers and which make some attempt to bring modern electronics into the classroom, the establishment of more effective science-career counselling in the high schools, and provision of opportunities for young students with special talent for science and math to develop their interest in these areas. The study also proposes the creation of a President's Council on Excellence in Science and Technology Education akin to the President's Council on Physical Fitness and Sports. It emphasizes, however, that primary and secondary education must remain primarily the responsibility of state and local government.

Frank Press, President Carter's science adviser, had planned before the election to hold a series of regional consultations among educators, scientists and state and local officials to reflect on the report and to plan appropriate actions. What use the Reagan administration, which has proposed eliminating the year-old Department of Education, will make of the document is as yet undetermined.

Copies of the report are available from the Forms and Publications Office, Room 235, National Science Foundation, 1800 G Street, NW, Washington, D.C. 20550. —MEJ

Three scientists elected to House

Of the six Congressional candidates in November's elections who had backgrounds in physical science (PHYSICS TODAY, October, page 52), only three won election or reelection. James Martin (R-N.C.), a chemist, and Don Ritter (R-Pa.), a metallurgist, were re-elected to fifth and second terms, respectively. Jim Coyne, president of a chemical and an energy technology corporation in Pennsylvania, was elected to his first term in the House.

In what will surely be a loss to the physics community, Rep. Mike McCormack (D-Wash.), a ten-year veteran of the House, was defeated by his Republican opponent. As chairman of the House subcommittee on energy research and production, McCormack was a strong supporter of nuclear and fusion energy research, and was a prime mover behind the Magnetic Fusion Energy Act that was passed this Fall by Congress (PHYSICS TODAY, November, page 61).

Coyne took over the Coyne Chemical Corp., a family business, in 1971. Coyne is also founder and president of ReChem, which promotes renewable-resource energy technologies, and Energy

Management Services, Inc., an energy-conservation consulting firm. He has testified on energy before the Environmental Protection Agency, the Senate and the House of Representatives. He has also served as an energy specialist with the House Committee on Science and Technology.

Before the election, Coyne told us that if the US does not make "a commitment to research and development as we made in the decade of the '60's ...we will find that we as a country will quickly become uncompetitive in a world where there are no rewards for second place." —MEJ

DOD encourages industry to subcontract research

Universities will soon have more industrial contracts for basic research, if a new Defense Department initiative is successful. The DOD is now working out the details of how to implement a June memorandum from William J. Perry, the Under Secretary of Defense for Research and Engineering, directing the research heads of the Army,

Navy, Air Force and the Defense Advanced Research Projects Agency to encourage industrial contractors to subcontract basic research projects to the academic community. The directive is presumably related to President Carter's promise last year to encourage university-industry ties to stimulate industrial innovation.

Perry would have industries using part of their independent research and development funds (which are normally included in overhead charges in DOD contracts and spent on R&D activities not necessarily related to the contract they are charged to) to finance the university subcontracts. "Subcontracting IR&D funds in this fashion should provide substantial benefits in terms of a strengthened industry/university interface and the enhancement of basic science in areas where contractors have a vested interest but lack the facilities and skills to conduct their own research," according to the memorandum.

The DOD research office, headed by George Gamota, has the responsibility of implementing the initiative.

Vacuum congress moved to three circus tents

More than one scientific conference has been likened to a three-ring circus, but the analogy could never be taken as literally as at the 8th International Vacuum Congress, held in Cannes, France, 22-26 September in conjunction with the International Conference on Solid Surfaces and the European Conference on Surface Science. (All three were sponsored by the International Union for Vacuum Science, Techniques and Applications).

On their arrival at the Palais des Festivals in Cannes (which had been booked three years in advance to house the meeting and its accompanying vacuum product exhibition) on 15 September, the local organizers, members of the French Vacuum Society, were told by the mayor of Cannes that the Palais des Festivals was not available for their use. The mayor said that because they could not cancel the conference, the city would erect three circus tents in the parking lot of an athletic stadium some 8 km from the Palais, as a substitute accommodation. Apparently another group had reserved the Palais for a videocommunications exhibition the following week, and required the week of the 22nd to set up their equipment.

The local organizers were understandably distraught. In five days, 1500 vacuum scientists and equipment exhibitors from 37 countries would arrive expecting to participate in a conference that only takes place once every three

years. Even government ministers and heads of French scientific and industrial organizations, alerted to the vacuum society's plight, were unable to sway the Cannes official.

And so the conference went on, with most of the speakers and exhibitors choosing to remain in Cannes and stick it out. Monday, the first day of sessions, was chaotic. Although busses to take the participants to and from the conference were provided, as were an open bar and restaurant, there were electrical malfunctions, the weather was particularly hot and humid, and the tents were unventilated and crowded. But soon temperatures and temperatures cooled, blowers were set up in the tents, and everyone began to see the lighter side of the situation. By Tuesday, the conference was running fairly smoothly. John Bertucci, who represented MKS Instruments at the exhibit, told us.

Nonetheless, various legal and other actions are in the works. The French Vacuum Society is filing a class action suit for breach of contract against the town of Cannes. The American Vacuum Society has registered a protest with the US embassy in Paris. Because the exhibitors' contracts were with the French Vacuum Society, some are considering suing the Society. And IUVSTA will ask IUPAP and IUPAC for an official boycott of Cannes for all future meetings. —MEJ

NSF physics division staff and advisers

Val L. Fitch of Princeton University (see page 17) assumed the chairmanship of the NSF Advisory Committee for Physics on 1 July. Fitch was elected by the Committee's members after Chairman Peter Carruthers (Los Alamos) announced that he was stepping down from the post. Three new members will be selected by January. The remainder of the membership includes J. A. Armstrong (IBM), Robert A. Eisenstein (Carnegie-Mellon University), Hans E. Frauenfelder (University of Illinois, Urbana), Anne Kernan (University of California, Riverside), Neal Lane (Rice University), Claire E. Max (Lawrence Livermore Laboratory), William H. Press (Harvard College Observatory) and Robert G. Stokstad (Oak Ridge).

The NSF Advisory Committee for Physics makes recommendations directly to the head of the Directorate for Mathematical and Physical Sciences, William Klemperer, as well as to the NSF Division of Physics. These recommendations arise from the Committee's review of the Foundation's actions regarding physics, its oversight of major project planning and its mediation of

the financial support afforded to the various physical subfields.

Richard Deslattes, chief of the quantum metrology group at the National Bureau of Standards and a senior research fellow there, was recently appointed acting director of the physics division. Deslattes replaced Neal Lane, who completed his one-year appointment to that post and has now returned to Rice University, where he was chairman of the physics department. Deslattes and Lane are filling in for Marcel Bardon, who is on leave serving as science attaché to UNESCO, and is expected back in August.

Also in the physics division, David Berley has replaced Alexander Abashian (who has gone to Virginia Polytechnic Institute and State University) as elementary-particle physics program director; Richard Heins replaced Gaurang Yodh (who returned to the University of Maryland) as elementary-particle physics program officer; Robert Hill replaced Laird Schearer (who returned to the University of Missouri, Rolla) as atomic, molecular and plasma-physics program officer, and Jeffrey Mandula has replaced Boris Kayser (who is on leave at SLAC until September) as theoretical-physics program director.

Centers to fund academic-industrial research

A bill that authorizes \$285 million between Fiscal Years 1981 and 1985 to establish industrial technology centers at universities was signed by President Carter in October. The law, known as the Stevenson-Wydler Technology Innovation Act of 1980, also establishes an Office of Industrial Technology in the Department of Commerce. Carter vowed to initiate what he called "generic technology centers" last year as part of his proposals for stimulating industrial innovation (PHYSICS TODAY, January 1980, page 119).

The National Science Foundation and the Commerce Department are to set up Centers for Industrial Technology at universities or other nonprofit institutions. The Centers will sponsor joint industry/academe research on generic technologies, in which individual firms have little incentive to invest, but which may have significant economic or strategic importance, such as manufacturing technology. The centers are also to provide assistance and advice to individuals and industries, particularly small businesses. Under the act, at least 25% of each center's funding will come from industry, and the centers will be expected to become, ultimately, either self-sustaining or totally industry-supported. Each center will have the option of acquiring title to any

invention conceived or made there, provided the Center intends to promote commercialization of the invention.

The Commerce Department has already issued regulations and requests for proposals for the centers. Welding and joining, tribology and powder metallurgy are the first three generic technologies selected to receive support.

Although Congress and the Carter administration agree on the need for such industrial centers, industry itself is not so enthusiastic. The Industrial Research Institute, for example, has issued a statement saying that it is wary of such centers, "since there is a significant risk that such laboratories may become a self-perpetuating drain on national resources and lack the necessary inputs on market needs and opportunities to be an effective force in the innovation process."

In addition to the Office of Industrial Technology, the bill establishes a National Industrial Technology Board, made up of 15 members, to review the activities of that Office, a Center for the Utilization of Federal Technology within the Commerce Department, to serve as a central clearinghouse for the transfer of information about Federally owned technologies to state and local governments and private industry, and requires each Federal laboratory to form a Research and Technology Applications Office to ensure full use of the results of the Federal R&D investment.

The Act authorizes \$24 million for FY 1981 and a total of \$261 million for the following four years. —MEJ

in brief

Stanford University plans to establish a research facility dedicated to the design and development of very large-scale integrated circuit systems. Sixteen million dollars, mostly from government and industry sources, will fund a 60 000 square-foot building and computer design automation and circuit fabrication equipment.

A fund for extragalactic research has been set up at the University of Texas at Austin using proceeds from the sale of 19 acres of land donated to the University by Gerard de Vaucouleurs, a professor of astronomy there, and his wife.

The National Science Foundation has announced the establishment of the Vannevar Bush Award to be presented to "a senior statesman of science and technology" for an outstanding contribution to science and technology through public service. The Bush Award will be given sporadically and will carry no monetary stipend. Bush was largely responsible