

# state & society

## ERDA will continue to push frontier facilities: Kane

"Go to the frontier!" is the advice James S. Kane hears from representatives of the scientific community. Kane, who is Deputy Assistant Administrator for Physical Research and Director of the Division of Physical Research at ERDA, told us how that advice affects ERDA's programs in high-energy and nuclear physics. Another factor, he said, is the under-utilization of such major facilities as Fermilab and the Stanford Linear Accelerator Center. He told us that high-quality science is equally as important as short-term relevance to the agency's energy mission as a criterion for determining what research receives support.

Kane took over responsibility for planning and administering ERDA's physical-research program in December 1975—before that he had been Deputy Assistant Administrator for Conservation since he came to ERDA from AEC in January of that year. He holds a PhD in chemistry from the University of California at Berkeley, and prior to his Washington career he served as head of the Chemistry and Materials Science Department at the Lawrence Livermore Laboratory.

**Advice from HEPAP.** Ground has been broken, Kane told us, for PEP, the large new positron-electron colliding-beam storage ring undertaken jointly by the Lawrence Berkeley Laboratory and SLAC; at the same time, it appears quite

likely that ERDA will soon decide on a shutdown date for Argonne National Laboratory's Zero-Gradient Synchrotron, though Kane agrees that the ZGS has been very productive and possesses unique capabilities for investigation of spin phenomena (see *PHYSICS TODAY*, December, page 69). Is it wise, we asked, to sacrifice the lower-energy facilities in favor of ever more powerful accelerators, when much work remains to be performed in the lower ranges? Kane told us that for such decisions he relies heavily on expert panels—HEPAP, for example—because the questions involved require the very best technical physics insight. "That's the sort of thing," he said, "I don't think bureaucrats ought to do."

Kane said he seeks the scientific community's input on what should be built and what should be given up in order to do so. "The advice I almost invariably get," he told us, "is to put our money on doing research no one else can do, at the frontiers of knowledge." Research other than at these frontiers, according to Kane, is an activity the rest of the world can do as well as the US, "and maybe they'll find some gold we missed." But his best physical-research advisers, he said, always urge that ERDA go ahead with a new frontier facility; whether or not such a policy really is best for scientific progress, only hindsight will tell, according to Kane. Meanwhile, the most painful applications



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of the "frontier" approach have taken place in nuclear physics. Kane told us the trend, first at AEC and now at ERDA, over the last ten years has been to shut down university cyclotrons and Van de Graaffs in order to support the larger and more powerful user-oriented machines, such as the Los Alamos Meson Physics Facility, the Bates electron linac and the Bevalac. By way of example, he said it

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## Departing Ford team establishes two new science groups

Science-policy decisions made in the final days of the Ford Administration are expected to influence the activities of President Jimmy Carter's White House science-advisory apparatus for some time to come. H. Guyford Stever, former-President Gerald R. Ford's Director of the Office of Science and Technology Policy, announced prior to his stepping down the organization of two high-level science-advisory bodies; they are the Federal Coordinating Council for Science, Engineering and Technology and the Intergovernmental Science, Engineering and Technology Advisory Panel. Stever also revealed recently several items in the research-and-development portion of the former President's budget request to

Congress for fiscal year 1978, including the Large Space Telescope and doubled support for earthquake-prediction research.

**Interagency rapport.** The legislation that brought into being the White House science office and the President's Committee on Science and Technology (*PHYSICS TODAY*, July 1976, page 61) also established the two new advisory groups. The Coordinating Council exists to consider problems and developments affecting more than one Federal agency; it is charged with making policy recommendations to help achieve improved planning and administration of national efforts in science, engineering and technology, as well as to identify research

needs, effect better use of resources and facilities, and expand international scientific cooperation. According to William C. Bartley, OSTP staff member and executive secretary of the Council in the Ford Administration, the FCCSET was set up with three functions in mind: securing voluntary agreement among agencies on general management principles; ascertaining the possible contributions of various agencies on a given problem, and dealing with issues for which there exist only bulky coordination mechanisms.

Stever's announcement included the names of agency representatives selected for Council membership and a list of new committees established under the Council. The FCCSET consists, by statute, of

the following Federal departments and agencies: Department of Agriculture; Department of Commerce; Department of Defense; Department of Health, Education and Welfare; Department of Housing and Urban Development; Department of Interior; Department of State; Department of Transportation; Energy Research and Development Administration; Environmental Protection Agency; National Aeronautics and Space Administration; National Science Foundation, and the Veterans Administration. Bartley told us that the representatives and committee heads named were likely to change with the new Administration, but that the committee structure of the Coordinating Council would probably endure: "I think the initial work plans and the kinds of issues these committees will be looking at will be developed and will proceed."

The Ford science-advisory team formed a set of six problem-oriented committees and four policy-oriented ones, together with a special committee to coordinate FCCSET operations. The problem-oriented bodies are to deal with issues of earth and natural resources; health and medicine; food and renewable resources; transportation and communications; human resources and community development, and atmosphere and oceans. The other four committees will consider policy questions related to intellectual property and information; science, engineering and technology resources and research disciplines; R&D management, organization and facilities, and international science, engineering and technology.

**Non-Federal advisors.** Stever's OSTP staff worked with public interest groups to choose members for the Intergovernmental Advisory Panel. The Panel is to identify problems and priorities for science at the State, regional and local levels and to assist the President's science advisor in transferring Federally sponsored technology to governments at those levels. As organized by Ford's science-advisory personnel, the Panel consists of 16 members: State Governors, mayors, State Representatives, county officials and others. As with the FCCSET, the Panel is chaired by the OSTP director; it is to meet four times annually. At the time of Stever's announcement, a steering committee and two working groups—one on processes of technology transfer and R&D capacity building in State and local government, the other on priority-problem identification—had been established.

**Budget tipoffs.** Before the President's FY 1978 budget request was officially released last month, Stever reported the results of a meeting with Ford, former Office of Management and Budget director James T. Lynn and leaders in science and technology on the budget's content. "There is a definite start . . . in

the coming budget," Stever said, for the Large Space Telescope, a 2-meter optical telescope to be placed in orbit about the Earth by the Space Shuttle. Another new start for NASA, he said, would be a Jupiter-orbiter probe to be launched in 1981; a third space initiative included in the Ford budget is LANDSAT D, the fourth in a series of experimental survey satellites.

Stever also indicated that Chinese and Soviet successes in earthquake prediction had led to increased interest in that field; support for research into the prediction of earthquakes and mitigation of their effects has been approximately doubled over FY 1977's \$25 million, he said.

In further comment, Stever revealed that ERDA would receive funding for studies to reduce the risks associated with plutonium in fission power production; defense-department R&D support is to be increased by about 16% over Ford's FY 1977 request, and the budget calls for an average 3% increase in support, beyond inflation, for all Federally funded basic-research activity. —FCB

## Kane on ERDA

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would take the shutdown of about four large university cyclotrons to fund one-fifth of LAMPF's operational costs. And according to Kane, when ERDA impanels a group of scientific experts to consider such a choice, that is the advice he receives.

**Only 48% utilization.** Kane told us his agency supports about 90% of the high-energy physics work performed in this country; the OMB views ERDA as the "executive agent" in this area. Yet Kane acknowledges that the major high-energy facilities are "clearly under-utilized." Last year the Joint Committee on Atomic Energy recommended that the agency increase the utilization of its equipment. Despite this, he said, the average utilization of ERDA's four big facilities—SLAC,

Fermilab, the ZGS and the Alternating Gradient Synchrotron at Brookhaven National Laboratory—is approximately 48% of what it could be given adequate funding. The turn-on costs of running these machines are so large, Kane told us, that when utilization falls below about one-half of the maximum, research output per dollar drops dramatically. Most of the money goes to running the facility.

Kane cautions, however, that it is difficult to measure the utilization of a high-energy facility accurately: "On" means different things," he said, depending on the user's needs. For example, some of the most exciting physics coming out of SLAC these days, according to Kane, is based on experiments using SPEAR, Stanford's present storage ring. The utilization of SLAC, in terms of pulses available, may be only 30%, he estimated, yet this level allows the SPEAR facility to be used to good advantage in the search for new charmed particles, an effort that doesn't require many pulses per second. On the other hand, he said, this utilization rate falls far short of that which other experimenters not using the storage ring require, because "they usually need all the intensity they can get."

Kane discussed with us the prospects for new developments in ERDA's high-energy program. ISABELLE, Brookhaven's proposed 200-GeV Intersecting Storage Accelerator for protons, remains the highest-priority item in the division's high-energy program, he said, but "we have not made up our collective minds" whether to build the device and when. The SLAC two-mile accelerator will be used as an injector for PEP. The future of SPEAR after PEP starts operation in 1981 is also uncertain, he told us; Wolfgang Panofsky, director of SLAC, has agreed to half-time use of SPEAR by the Stanford Synchrotron Radiation Project once PEP comes on line. Kane said that ERDA would probably support the construction of a pulsed neutron source sometime in the future, but no agreement has been reached as to whether

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## Washington Bulletins

★ **Joint Committee on Atomic Energy loses House jurisdiction.** Members of the 95th Congress have approved, by an overwhelming vote of 256-142, changes in the House rules that effectively strip the 30-year-old JCAE of its powers. Jurisdiction over ERDA and all its nuclear research has been switched from the Joint Committee to the Committee on Science and Technology. The following committees absorbed other areas of legislative authority formerly in the province of the JCAE: Interior and Insular Affairs, domestic regulation of nuclear energy; Armed Services, military applications; International Relations, export of nuclear technology, and Interstate and Foreign Commerce, regulation and oversight of facilities. Senate action on the Joint Committee's jurisdiction was also expected.

★ **Levine to head NRC office.** Nuclear Regulatory Commission chairman Marcus A. Rowden has announced the appointment of Saul Levine as Director of the Office of Nuclear Regulatory Research, which administers NRC programs in nuclear safety, safeguards and environmental impacts.

the facility should be an entirely new machine—such as Argonne's proposed IPNS—or a modified existing facility.

ERDA is funding Fermilab's Energy Doubler/Saver, a ring of superconducting magnets to be installed in the main tunnel. When completed, this project will double the energy of the accelerated protons to 1000 GeV and reduce the electric power used. The development work is being done out of operating funds, rather than with construction funds, Kane said. He justifies the project's support as follows: "We have defined it as a development project, not as construction, until we get a beam. Anything we have to do after that to make it the real Doubler/Saver—like upping the rf, for instance—will be construction," but for now he is trying to get along just using R&D money.

Kane told us his highest-priority construction project for the next fiscal year is a new \$24-million synchrotron light source, proposed in the FY 1978 budget, to be built at Brookhaven. This, too, will be a frontier facility, he said, with applications in many areas of science, not just in energy-related work.

**Nuclear-research funding history.** Because the President's budget request for physical research at ERDA in FY 1977 was "so stringent," according to Kane, the low-energy portion of the agency's nuclear-science request was deliberately cut back by almost \$3 million. "The OMB didn't tell us to do that, *we* did it," he said, in order to expand basic-research programs in other areas. Congress appropriated an extra \$7 million for ERDA's nuclear-science program last year, but it also failed to authorize any of the ERDA budget, including the additional money. At the time we spoke with Kane, he expected that the program would receive the full \$7 million for nuclear science provided as a Congressional add-on.

**Materials and molecular sciences.** Kane told us he expects ERDA's support for high-energy and nuclear physics to remain fairly level for the foreseeable future, but in other physical-research areas he looks for increasing activity. Some of the fields to be studied more intensively, he said, are combustion and the formation of pollutants from fossil fuels; the structure and chemistry of coal; catalysis, especially as related to hydrocarbons, and the whole realm of photoconversion, the transformation into usable energy of photons (and the storage of that energy).

Many of these concerns come under the heading of materials sciences, and Kane outlined some of the division's physics-related efforts in this category: For historical reasons, he said, ERDA runs most of the high-flux research reactors in the US; originally used for the study of scattering cross-sections and neutronic phenomena, they now are employed extensively in solid-state research, for which

their neutron beams make fine probes. Because of the slowdown in nuclear-physics support, research-reactor operations may be affected. In the past the nuclear-physics and materials programs had been sharing the cost. Now there is danger that the materials-research program will be unable to afford the increased cost. Kane told us the division is also heavily involved in superconductivity; other materials-related research includes the study of how impurities in coal affect structural materials in fossil-energy plants and of the combined effect of chemicals and stresses in corrosion.

In the division's catch-all "Molecular, Mathematical and Geosciences" program, Kane told us, combustion is an area in which ERDA must really push hard to solve very complex physical problems almost from first principles. The division's mathematics program emphasizes applied, mostly numerical, work; according to Kane, the agency possesses an enormous complex of computation equipment, including most of the really big computers in the US.

**"Relevance" vs "Good science."** Asked how he chooses which physics research efforts to fund, Kane told us that the agency's energy mission in no way restrains him from supporting promising new physics work that comes along. "I believe deeply," he said, "that so many times you don't know what's 'relevant' until after you do it. Good science has a way of proving relevant." If a mission agency takes the attitude that it won't try anything unless the expected results are clearly relevant to one of its existing programs, then it is heading for trouble, according to Kane.

—FCB

## Kissinger asks cooperation for technology transfer

At a National Meeting on Science, Technology and Development convened in Washington, DC by the State Department in the waning days of the Ford administration, then-Secretary of State Henry Kissinger called on the audience of 800 business, government and academic leaders to help in the process of technology transfer. The conference was the first held to assist the State Department in planning for the United Nations Conference on Science and Technology for Development, scheduled to take place in 1979.

In his keynote address Kissinger said, "When we called this conference we were expecting to do some more long-range planning than now turns out to be the case . . ." When the laughter subsided, he said that if other nations do not have a sense of belonging, "then those who feel themselves disadvantaged, unjustly treated, dispossessed, will band together, and they will join any other group that is willing to undermine the existing order."



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"In the broad self-interest of the United States which, in this sense, is identical with the world interest, development of less-developed nations must be one of the increasing concerns of our country." The developing countries must have access to worldwide capital markets, and they must be helped to find new markets for the goods and services that they produce. Although the international community ought to help them develop, transfer, adapt and manage technology appropriate to their needs, "there is no substitute for hard effort by the developing countries in their own process of development . . ."

Over the last year the US had made a number of proposals, which include:

- ▶ Creation of an international center for exchange of technological information,
- ▶ Support of regional advisory services under UNCTAD auspices,
- ▶ Establishment of an international resources bank,
- ▶ Development of incentives and measures to curb emigration of highly trained manpower from developing countries, and
- ▶ Establishment of an international energy institute and an international industrialization institute.

—GBL

## Office of Naval Research celebrates anniversary

The Office of Naval Research has marked its thirtieth anniversary with an awards banquet and a two-day symposium. Highlights of the celebration were the presentation of a citation to ONR by William A. Fowler, president of The American Physical Society, and an award honoring James A. Van Allen, discoverer of the radiation belts that bear his name.

Fowler's citation praised the Office for setting an example "in establishing a pattern of support for research in physics, and in other sciences," that has proven