state & society

Kennedy urges greater Federal support for science

Senator Edward M. Kennedy thinks that "more members of the scientific community should really get active" in supporting NSF appropriations and in "getting their views across to more Congressmen" on legislative questions affecting science. Kennedy outlined his own views on this and other topics in a recent discussion with PHYSICS TODAY. The Massachusetts Democrat would like to see total Federal support of science and technology increased from the present $17 600 million per year to about $20 000 million, and then maintained at about 2% of the gross national product. He believes NSF should get about 0.1% of the GNP, which would roughly double current funding to about $1000 million per year.

For the last year and a half Kennedy has been chairman of the Senate Special Subcommittee on the National Science Foundation, and he has emerged as the leading Senate spokesman for US science. Currently he is a candidate for reelection to his Senate seat. He has urged greater Federal support for research and science education, and he is a Senate cosponsor of a bill to set up Government machinery for technology assessment.

On 14 August, the day of his meeting with us, Kennedy introduced in the Senate the Conversion Research, Education and Assistance Act of 1970. The chief aim of the bill is to enable NSF "to conduct research and educational programs to prepare the country for conversion from defense to civilian, socially-oriented research and development activities." ("Defense" R & D is defined in the bill to include AEC and NASA work.) Over the next three fiscal years $450 million would be authorized to "redirect the vast reservoir of talent of our scientific and technical community" to problems such as crime, pollution, housing, health care, transportation and education. Through grants and contracts NSF would support research on conversion problems, and also programs for retraining scientists, engineers and technicians. NSF would award "conversion fellowships" to scientists and others.

Kennedy estimates that about 15 000 people would be retrained through the Conversion Act. Physical scientists might be expected to benefit especially because, compared to other scientific groups, they have been heavily involved in defense R & D.

Kennedy noted that the Conversion Act might help to prevent the sort of situation that occurred when NASA's Electronic Research Center in Cambridge, Mass., was transferred to the Department of Transportation and about 160 out of 250 physicists lost their jobs (PHYSICS TODAY, July, page 61). Kennedy thinks that the technical staff cuts at the Cambridge Center were "an obvious waste of a national resource."

In the Conversion Act, Kennedy asks that Congress declare that "the total Federal investment in science and technology must be restored" to an adequate annual level and then grow in proportion to the GNP. He noted that this investment peaked at about 2.6% of GNP in 1963–64 but is only about 1.8% this year. He would like to see Congress commit itself to maintaining support of science and technology at about 2% of the GNP on a long-term basis.

Kennedy also endorses the principle of tying Federal basic research support to the GNP. With respect to the figure of 0.1% of the GNP for the National Science Foundation, he observed that "certainly there is a need of that magnitude."

In addition to urging more money for NSF, Kennedy believes that the mission

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MORT BROFFMAN

Senator Edward Kennedy talks with PHYSICS TODAY's John Phelps.

Bomb kills physicist, damages equipment

One physicist is dead, another badly hurt, an accelerator, two electronic computers, nuclear-physics and low-temperature apparatus are either badly damaged or destroyed. The cause was the blast from a bomb exploded in the early morning of 24 August at the University of Wisconsin in Madison.

The worst damage occurred in a wing of Sterling Hall that was built in 1959. It housed the Astronomy Department on the fifth and sixth floors, mathematics research on second, third and fourth floors, a CDC 3600 computer used for high-energy research on the third floor, physics research on the first and ground floors, plus a Model EN tandem Van de Graaff accelerator in an underground vault. Despite widely published reports that the mathematics research center was severely damaged, the worst damage occurred to the physics researchers, physics equipment and laboratories.

A detailed assessment of damage was still not available at the end of August because the areas most badly damaged were considered unsafe to enter.

Five minutes before the blast occurred police received a telephone warning. The bomb, located inside a truck, exploded at 3:45 AM, just outside the lab of Henry H. Barschall. His student, David Schuster, was running an experiment on the accelerator. In a low-temperature laboratory, Robert Fassnacht, a postdoctoral researcher who worked with Joseph Dillinger, was running an experiment on superconducting transi-

JOHN LOHR

Bomb damage at University of Wisconsin. Above: Paul Quin (left), who suffered minor injuries from the explosion, and Robert Borchers survey damage at the low-energy end of tandem Van de Graaff. Heavy cast aluminum vacuum valves were sheared off by explosion, and the alpha-particle and direct extraction ion sources, which formerly stood in the area between Borchers and Quin, are completely missing. Accelerator is in an underground vault; bomb was at ground level. Photo was taken one day after blast during salvage of important items such as computer tapes. Later the lab was declared off limits. Below: Exterior of Sterling Hall.

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tions of separated isotopes. That morning he was studying aluminum. Fassnacht, 33, and the father of three children, had earned his PhD under Dillinger.

The bomb explosion left Fassnacht dead (see obituary on page 69). David Schuster was severely injured, suffering internal injuries. Paul Quin, another nuclear-physics postdoc, required stitches. Also injured were a night watchman and a patient at a nearby hospital.

Barschall said that he did not know whether or not the nuclear-physics project would ever go back into operation. His experimental program, supported by AEC for 22 years, is led by Barschall, Willy Haeberli, Robert Borchers and Hugh Richards. There are 30 graduate students and six postdocs. Barschall said the tandem was damaged (extent unknown) but not destroyed. A Honeywell DDP-124 computer, used on line with the accelerator and located closer to the blast, was apparently destroyed. The CDC-3600 was either severely damaged or destroyed.

Whether or not notebooks, data, magnetic tapes and so on can be found or deciphered was not yet known. Mathematics offices had been badly damaged; the amount of damage to astronomy offices and equipment was still unknown.

Dillinger, who leads Wisconsin low-temperature research, said that all his best equipment, which had been in the lab where Fassnacht was working, was apparently destroyed. Apparatus included a He^3 refrigerator with very large cooling capacity and working space and a He^3–He^4 dilution refrigerator, both built at Wisconsin, and all his measuring equipment. Dillinger, who has been at Wisconsin for 24 years, now has five graduate students and a postdoc. —GBL

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agencies of the Government should continue to support basic research in particular fields. "I don't think there can be any question about that."

The case for research support, Kennedy thinks, must depend largely on "relevance" both in NSF and in the mission agencies. Science budgets have grown to the point where "Congress is not likely to support much research just as a means of satisfying intellectual curiosity." But he emphasizes that justifying research on the basis of its ultimate value to society does not mean stressing applied R & D at the expense of basic research. His broad concept of "relevance" extended to the unexpected yet certainly predictable benefits that may arise from basic research in many fields.

Commenting on what some have called an "antiscience" reaction on the part of the public, Kennedy had two observations. He thinks that US science has suffered from a popular overidentification with military research and expensive new weapon systems, "as unjustifiable as that might appear." Also, he believes "many people equate a kind of dehumanization and depersonalization with scientific and technological progress." Kennedy spoke eloquently of the need to "bring home to the American people and to Congress" what science can do to help solve "many of the critical and crucial problems that we face, here at home and around the world . . . if we can bring to bear on these problems the extraordinary creativity, concern and commitment of members of the scientific community."

The present level of communication between scientists and Congress leaves much room for improvement, in Kennedy's view. He thinks that communication is good enough between the scientific community and the relatively few Senators and Representatives whose committee assignments involve them with science questions. But otherwise, "science has no real constituency." Kennedy notes that Congressmen received very little mail support of this year's NSF appropriation. This contrasts sharply with the volume of messages received when, for instance, money for education or for urban renewal is at stake. Also, "we hear a lot from scientists on issues like ABM, but relatively little about how we're maintaining and using our scientific resources." —JBP

Users group is formed for Oak Ridge nuclear facilities

A University Users Group will develop an on-line isotope separator facility to study nuclei far off stability with heavy-