state & society

Wisconsin physicists pick up the pieces and get back to work

Nuclear-physics research has resumed at the University of Wisconsin in Madison but the building and equipment damage caused by the bombing of Sterling Hall last August is still far from completely repaired. The explosion (PHYSICS TODAY, October 1970, page 73) which took the life of Robert Fassnacht and severely injured David Schuster, had badly damaged or destroyed nuclear-physics, low-temperature and solid-state equipment and portions of the building. Four men have been charged with setting off the bomb but at this writing are still at large.

After the blast, offers of help came from almost every laboratory in the US and from some foreign laboratories as well, according to Hugh Richards, associate chairman of the physics department. People volunteered to come personally, to lend equipment and to make time available on their accelerators to Wisconsin experimenters.

The Wisconsin group decided to repair the Model EN tandem Van de Graaff themselves, and succeeded in running a beam through the repaired accelerator three months after the blast. To repair the machine the entire vacuum system was disassembled and cleaned, the accelerating tubes were replaced and the low-energy vacuum system and ion sources were completely rebuilt. Within a month of the blast the on-line computer, a DDP-124, had been restored to most of its normal operations. (Originally the Wisconsin group thought the computer had been destroyed because two walls of the computer room were blown onto it.)

Although the accelerator and computer operation is excellent, Richards told us, the nuclear-physics research program still suffers acutely from lack of support facilities (shops, preparation laboratories, supplies and equipment). Building repairs are expected to be finished in the fall. Meanwhile the nuclear-physics group operates from the relatively undamaged part of Sterling Hall that the Mathematics Research Center previously occupied.

The CDC-3600 computer turned out to be less severely damaged than the DDP-124. The big machine, jointly owned by the high-energy project and the university, was no longer being used and was for sale at the time of the blast. It had been replaced by a Univac 1108.

Henry H. Barschall has been scouting for surplus AEC equipment that could be used at Wisconsin. Three laboratories have been extremely helpful and cooperative—the Princeton-Pennsylvania Accelerator (whose AEC support ends in June), Lawrence Radiation Laboratory in Livermore, and Brookhaven. They have provided machine tools, electronic equipment, vacuum pumps and other equipment.

Most of the data have been recovered but graduate students in nuclear physics have had their PhD research delayed about six months on the average. Schuster is still under treatment for his injuries, but he is finishing up his PhD thesis.

Restoration of the building is being paid for by the state's insurance fund. It is not clear how much reimbursement the fund will provide for equipment because it must be appraised and depreciated. Also the fund will apparently not pay for equipment owned by the federal government.

One of the solid-state laboratories of Richard Dexter was effectively demol-

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Repairs under way at Sterling Hall, University of Wisconsin, Madison, following bomb blast on 24 August. The tandem Van de Graaff is underground just beyond the brick parapet in the foreground.

Fewer students enroll in PhD programs

The number of first-year graduate students at PhD-granting institutions for 1970 represents the lowest incoming enrollment in eight years, down 17% from 1969, although the total number of graduate students has remained constant at about 14 300 (see table 1). These statistics were recently compiled through surveys conducted by the American Institute of Physics, education and manpower division.

Responses from the 175 physics and astronomy department chairmen in PhD-granting institutions point to two causes: students' awareness of a tight job market and universities' willingness to use funds to hold present students until the job market improves. This holding pattern is demonstrated by the increase in the fraction of graduate students supported by teaching and research assistantships, which went from 53% in 1969 to over 60% in 1970.

The situation was reversed for the 130 MS-granting institutions. First-year graduate student enrollment increased from 716 in 1969 to 836 in 1970, a sharp contrast to the decrease in enrollment for PhD-granting institutions, from 3202 to 2658 (see table 2).

An even larger holding pattern exists for those who have already earned their PhD's. In November 1970 the AIP conducted a follow-up to its 1969 employment survey (see *physics today*, July 1970, page 63) and discovered that postdoctoral appointments were still filling the employment gap. By December 1969, 520 persons who had received their degree in 1968 or 1969 had accepted a temporary appointment; a year later, 55% were still in temporary posi-

requirements for the Venus probes could be somewhat less stringent than for previous planetary ventures. Because Venus exploration has demonstrated the inhospitability of that planet to terrestrial life, the panel has recommended a relaxation in sterilization requirements. Venera 7, the Soviet probe which was recently reported to have made the first successful soft landing on Venus, has confirmed the harshness of the Venusian environment. The surface temperature at the surface is, according to Tass, about 700 K and the atmospheric pressure at the surface is 90 atmospheres.

The report of the Venus panel is available from the Space Science Board, at 2101 Constitution Avenue, Washington, D.C. 20418.

NAL program for visiting high-energy theorists

A new theoretical program is being set up at the National Accelerator Laboratory beginning in the academic year 1971–72, when the machine is expected to produce its first beam. S. B. Treiman (Princeton) is organizing a group of high-energy theorists to spend varying periods of time, up to one year, at NAL. (This is in addition to the existing theory program.) Some are bringing their own financial support and others will receive assistance from NAL.

Treiman said that the emphasis will be on phenomenology and that for the first couple of years it is planned to continue having visiting theorists. He said NAL will welcome high-energy theorists who want to take their academic leave at NAL "rather than going to the fleshpots of Paris," but they will be expected to provide their own funds. NAL will act as host, providing office space.

Among those who expect to be at NAL for some period of time during the first year are: Henry Abarbanel (Princeton), Stephen Adler (Institute for Advanced Study), James Bjorken (SLAC), Curtis Callan (Institute for Advanced Study), Roger Dashen (Institute for Advanced Study), Sidney Drell (SLAC), Frederick Gilman (SLAC), Benjamin W. Lee (State University of New York at Stony Brook), Yoichiro Nambu (University of Chicago), Jeremiah Sullivan (University of Illinois), Treiman and C. N. Yang (Stony Brook). —GBL

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ished but he was fortunate to have already established a new research direction for himself at the Wisconsin electron storage ring 15 miles away in Stoughton. He does not plan to rebuild his old equipment.

Some of the low-temperature facilities, which were also heavily damaged, cannot be restored until the building construction is completed and funding is assured. —GBL

in brief

A protocol providing the basis for joint Soviet–American experiments at the Institute of High-Energy Physics in Serpukhov and the National Accelerator Laboratory, was signed by representatives of the Soviet and US atomic-energy commissions on 30 Nov.

Senior Fulbright–Hays awards for research and lecturing abroad during 1972–73 are available to US citizens with a doctorate or college teaching experience. Applications, which should be sent this Spring, are available from Senior Fulbright–Hays Program, 2101 Constitution Avenue, Washington, D.C. 20418.

The physics department of the College of William and Mary will use a three-year $610 000 NSF Departmental Science Development grant for new equipment, visiting faculty, and other teaching and research needs. The department now has 25 faculty members and 56 graduate students.

Rutgers University has started an interdisciplinary PhD program in Geophysical Fluid Dynamics. Emphasis is on basic dynamic mechanisms underlying motions in the atmosphere and oceans.

The Institute for Environmental Sciences has created a solar-radiation committee headed by Charles H. Duncan of the Goddard Space Flight Center. The committee will deal with such fields as radiometers, calibrations, simulation facilities, radiant-energy sources, optical, thermal and electronic design, instrumentation, and safety and maintenance. It is now planning to recommend a practice for solar simulation for thermal vacuum testing of space-flight materials and spacecraft.

The Institute of Physics and the Physical Society, 47 Belgrave Square, London. S.W. 1, is forming an Atomic Collisions in Solids Group, for those interested in the interaction of energetic particles with solids.

A new graduate program in petrology at the Stony Brook campus of the State University of New York emphasizes solid earth and moon studies. Stony Brook's Earth and Space Sciences Department also expects to add a new geophysics group.

the physics community

Project SEED: mathematics in the ghetto

An approach to teaching advanced mathematical concepts to culturally disadvantaged elementary school students was demonstrated during a recent New York City meeting of the National Council of Teachers of Mathematics. William Johntz, director of Project SEED (Special Elementary Education for the Disadvantaged) presented in his first lesson concepts including truth and false sets, infinite sets, substitution rules and operations with zero and negative numbers, to a fifth-grade class selected at random from a ghetto elementary school in the Bronx. Johntz employs in the SEED Project a "discovery" teaching technique similar to the ancient Socratic method. Because of their training in abstract mathematics, many physicists may be well equipped to participate in this program as instructors.

Johntz told us that SEED offers an alternative to university teaching and corporate research, "placing mathematicians and scientists directly in contact with the true intellectuals of our society—namely, children. We have in our project dozens of mathematicians who have given up university and industry employment in order to involve themselves full time in Project SEED. Others who continue to work in both worlds report that their research has improved."

Project SEED was initiated in the Berkeley, California school system in 1963 by Johntz, who had previously studied psychology and mathematics