RESEARCH FACILITIES AND PROGRAMS

The Cambridge Electron Accelerator

Dedication ceremonies were held on September 14 at Harvard University, the site of the new 6-BeV accelerator which was designed and built, and is now being operated, as a joint project of Harvard and the Massachusetts Institute of Technology, with the support of the Atomic Energy Commission. The accelerator first went into operation on March 7 with an initial beam of 2.2-BeV electrons. On August 13 it achieved the maximum energy for which it was designed, producing a beam of 6 BeV. The principal speaker at the dedication was Leland J. Haworth of the Atomic Energy Commission, who was one of a large delegation of distinguished scientists and government officials on hand for the ceremonies.

The Cambridge accelerator, built at a cost of approximately $12 million, is under the direction of M. Stanley Livingston, professor of physics at MIT. Its operating policies are governed by a joint committee made up of representatives from both MIT and Harvard, and it is the announced aim of the project to make the instrument available for research by investigators from universities and laboratories throughout the world.

British Accelerators Planned

England's National Institute for Research in Nuclear Science, which was created in 1957 as an independent agency responsible for constructing and operating costly high-energy research equipment to be used by nuclear scientists from British universities, has been authorized to establish a new high-energy research laboratory equipped with an electron synchrotron similar in design to that of the Cambridge electron accelerator operated by Harvard and MIT. The laboratory will be located in northern England where it will be within easy reach of the high-energy physics groups at the Universities of Manchester, Liverpool, and Glasgow. The synchrotron will provide a beam of 4-BeV electrons. As a research tool, it will complement the National Institute's other high-energy machine, the 7-BeV proton synchrotron at the Rutherford Laboratory near Harwell. The new laboratory will be headed by A. W. Merrison, who will be on leave from the University of Liverpool for a five-year period while serving as director of the high-energy installation.

At the Atomic Energy Research Establishment at Harwell, a 70-inch cyclotron, incorporating the spiral-ridge principle, will be designed and constructed by the National Institute's Rutherford Laboratory. The machine will be housed in a new building and will be operated by the AERE. It is expected to be completed by 1965 and it will be used by Harwell and university scientists primarily for studies of radiation effects and radiation damage. The cyclotron, designed to employ an azimuthally varying magnetic field, will accelerate particles to various energies and will provide high-intensity external and internal beams of several ions, including deuterons with a maximum energy of 25 MeV and protons up to 50 MeV.

Seismology

A new seismological station, which is expected to provide one of the world's most sensitive combinations of instruments for measuring earthquakes and tidal forces, is being built by the California Institute of Technology near Isabella Dam in the southern part of California's Sierra Nevada. The installation, made possible by an allocation of $172 540 from the Air Force Office of Scientific Research, will be equipped with Benioff extensometers, which are named after Hugo Benioff, professor of seismology at Caltech, and are described as being capable of measuring "a squeeze or a stretch of only one-sixteenth of an inch in the earth's crust between Pasadena and New York".

The extensometer, a fused-quartz tube more than 80 feet in length, is firmly anchored to solid rock at one end and is in contact with an ultrasensitive electronic sensor at the other. The sensor converts into an electric current any movement of the tube's free end, and the current, greatly amplified, activates a pen on a moving strip of paper. Two extensometers have been installed at right angles to one another to measure rock strains in horizontal directions, and a standard vertical, long-period pendulum seismometer will be employed to help in identifying types of earthquake waves. In addition to the measurement of the long-period waves generated by earthquakes, and to systematic studies of the effects of tidal forces, the station will attempt to detect irregularities in the movements of the earth's core and will explore the possibility of measuring the effects on the earth of the electromagnetic disturbances prevalent during periods of intense sunspot activity. Attempts will also be made to search for evidence of the gravitational waves which are predicted by theory but which have remained undetected.

Balloons

A launching base for scientific balloon flights has been established at Palestine, Tex., by the National Center for Atmospheric Research as part of the NCAR balloon program. Funds for the installation were supplied by the National Science Foundation, which is