

observatory buildings, consists of a central structure 40 feet long by 20 feet wide and two smaller structures. Constructed of nonmagnetic materials, the laboratory is designed to provide space for experiments requiring a quiet magnetic environment. Office space and darkroom facilities are provided in the main building.

All buildings on the site were constructed by Texas Instruments Incorporated and donated to the Graduate Research Center. The observatory has been equipped and staffed by the Coast and Geodetic Survey, and all its records will be in the public domain, i.e., they will be available to any scientist or group of scientists of US citizenship. The laboratory may be used by qualified organizations whose proposed programs are approved upon application to the Graduate Research Center.

### *University of Maryland Radio Observatory*

The Department of Physics and Astronomy of the University of Maryland has taken over the operation of General Dynamics Corporation's Clark Lake Observatory, located near Borrego, California. The radio observatory's main piece of equipment is a specially designed antenna array, which operates at a wavelength of 11.4 meters with an aperture of two miles, and thus allows investigation of a hitherto largely unexplored spectral region.

The observatory is located in a valley in the Southern California desert approximately 50 miles north of the Mexican border and 75 miles inland from the Pacific Ocean on a plot encompassing 2000 acres. According to William C. Erickson, who will direct research programs at Clark Lake, the site is "ideal for our observations since the 25 by 10 mile valley is shielded from interference by 5000 foot mountains and is inhabited only by observatory personnel and one hermit".

Dr. Erickson, who is now associate professor of astronomy at the University of Maryland, was associated with General Dynamics from 1957 to 1961 and supervised the construction of the Clark Lake facility. A native of Duluth, he holds degrees in mathematics and physics from the University of Minnesota. In addition to his appointments with General Dynamics and with the University of Maryland, he has taught at other institutions and was for a time associated with the Bene-

lux Cross Antenna Project at the University of Leiden.

Research plans call for the study of radio-wave scattering by irregularities in the sun's corona, observations of solar radio emission, and the investigation of the emission from distant radio sources. Initial work will be supported by a \$75 000 grant to the Department of Physics and Astronomy from the National Science Foundation. All of the facilities at the California site will be purchased from General Dynamics by the university.

### *Pioneer Nuclear Reactor Shut Down*

The world's oldest operating nuclear reactor, the Graphite Reactor at Oak Ridge National Laboratory, was shut down last month after twenty years of continuous operation. Advancing technology has provided more modern means for performing its functions. In the two decades that it has functioned, the reactor has operated about 90 percent of the time, with shut-downs for routine maintenance accounting for the 10 percent time out.

The Graphite Reactor was originally called the Clinton Pile and later was known as the X-10 Pile. Its construction was begun on February 2, 1943, two months after Enrico Fermi, working at the University of Chicago, had successfully operated the world's first controlled nuclear chain reaction. The Graphite Reactor went into operation on November 4, 1943, and shortly thereafter began to fulfill its primary function, the production of the first gram quantities of plutonium-239. After World War II, the reactor became a prime commercial source of radioisotopes. The first commercial shipment of isotopes left Oak Ridge in August 1946, and the Graphite Reactor continued to supply them to domestic and foreign users through the late 1950's.

### *Seismological Computing Center*

The University of Edinburgh has received a grant of \$280 700 from the US National Science Foundation to assist in establishing a seismological computing center within the University's Department of Astronomy. The NSF grant will be supplemented by £10 000 capital and £6500 recurrent from the British Treasury.

The project was conceived following studies by the Committee for the International Seismological Sum-



Antenna array at the Clark Lake radio-astronomy facility near Borrego, Calif., which has recently been acquired from the General Dynamics Corporation by the University of Maryland.

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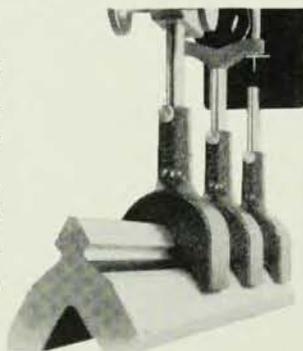
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mary, which pointed out the inability of existing institutions to cope with increasing data from world seismograph stations. Readings from these stations will be used at the new center to locate the positions of origin of all earthquakes which can be detected. This figure is currently estimated to total about 30 000 events per year. The readings are intended to provide a basis for a variety of research and engineering projects, including studies of the earth's interior, investigations of local crust-deformation phenomena, and estimates of earthquake hazards in developing countries.

#### *Japanese-American Instrument Tests*

In mid-October, a group of Japanese scientists joined a US Coast and Geodetic Survey team aboard the Survey's ship *Pioneer* in San Francisco to carry out inter-calibration tests of gravity meters and magnetometers made in the United States and in Japan. The testing program, conducted on the oceanographic equipment evaluation range in the Pacific, will compare the La-Coste gravity meter with Japan's Tsuboi single-string gravity meter. Two American-made magnetometers, the Warren-Vacquier and the Varian Proton, will be compared with the Japanese Rikitake-Uyeda magnetometer.

The joint project was arranged under the terms of recommendations made by the US-Japan Committee on Scientific Cooperation, which has called for close cooperation in certain areas of research by scientists from the two countries. United States participation is supported by the Coast and Geodetic Survey, and scientific arrangements for the bilateral program are coordinated in the United States by the National Science Foundation at the request of the Department of State.

#### *Arctic Cosmic-Ray Station*

A solar cosmic ray research station has been established at Shepherd Bay, N. W. T., Canada, by the National Science Foundation and Douglas Aircraft Company. Its location is the geomagnetic conjugate point of a similar geophysical station at McMurdo Sound in Antarctica.

Operated by Douglas for the NSF, the solar flare monitoring center will utilize two riometers working at thirty and fifty megacycles, respectively, a dopplometer, and a spherics receiver operating at twenty-seven kilocycles.

Primary objectives of the cosmic ray research at Shepherd Bay are to investigate the possible existence of periodic variations in solar flare absorption events and to determine the nature and properties of the emitted radiation. This information would be used in scheduling launching of lunar or interplanetary flights to coincide with times of least cosmic ray bombardment.

Data from both polar stations, which will be made available to scientists through World Data Center "A" in Boulder, Colo., will be part of the US International Year of the Quiet Sun program.