ney served as a U.S. delegate to the second Atoms for Peace conference in Geneva and as chairman of a panel that reported to Congress in 1956 on the impact of the peaceful uses of atomic energy. His published statements over the past 10 years indicate that his views on the role of atomic energy have changed with changing conditions. In the 1956 report to Congress, McKinney stressed the need for a program which would use atomic energy to meet the power requirements of other countries. However, as fuel reserves built up, particularly in Europe, he altered his views on the role of atomic energy. Speaking before Congress in May of this year, he said: "We need to rethink from scratch the way in which the United States employs the peaceful uses of atomic energy as instruments of international relations . . . We must face the fact that Europe's economic needs for nuclear kilowatts have receded."

Cooperation Assured

The study, which is now getting under way, is expected to occupy McKinney and his staff until June of next year. Assurance has been given by both the Atomic Energy Commission and the State Department of their cooperation. Chairman McCone of the AEC has assigned a number of members of his staff, including John Hall, assistant general manager for international activities, to work with the Congressional group. A similar assignment of personnel has been made by the State Department.

In the light of the faltering of the Euratom program and of McKinney's past statements, there is reason to believe that the study of this country's international atomic energy programs may result in a recommendation for a basic shift in policy away from emphasis on reactor construction toward a new emphasis on research and development. Certainly both the trend of thinking among the members of the Joint Congressional Committee on Atomic Energy and developments in Europe support this expectation. Whatever the final recommendations may be, the study, which is the first to be made since the broad outlines of U.S. policy on international atomic energy programs were laid down 5 years ago, and the selection of McKinney to direct it, seem to promise a full and necessary review of the many facets of this country's "atoms for peace" program.

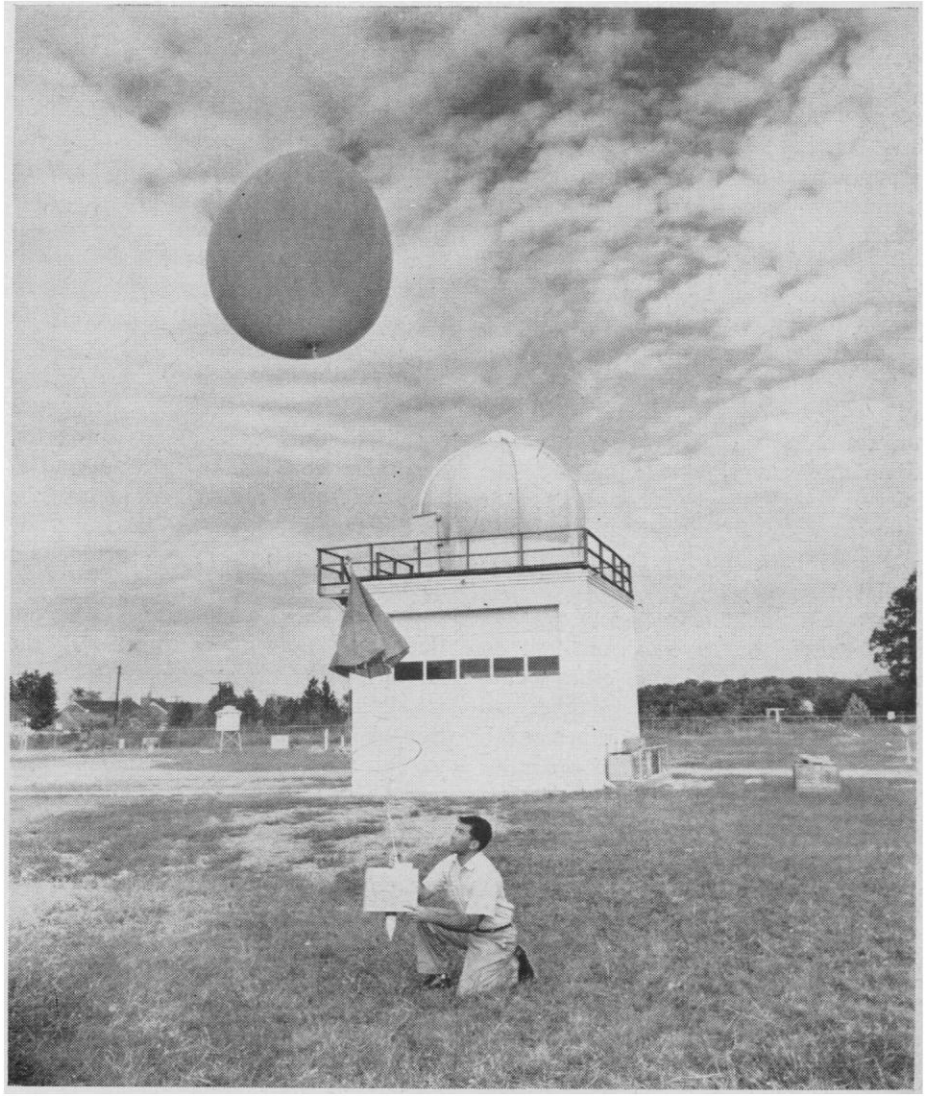
U.S. To Launch 10 Rockets in Week as Part of IGY Successor Program

Ten research rockets will be launched as the United States contribution to International Rocket Week, 16–22 November. The rocket series is part of the U.S. program for International Geophysical Cooperation–1959 (IGC–59), the continuation of the International Geophysical Year program of 1957–58. Responsibility for this country's activities in IGC–59 lies with the National Academy of Sciences' IGY Committee, which is headed by Hugh Odishaw.

The U.S. program for the rocket week is being coordinated internationally by the Committee on Space Research (COSPAR) of the International Council of Scientific Unions.

The National Aeronautics and Space Administration will launch two rockets from Wallops Island, Va. One Nike-Asp will measure upper-atmosphere winds at heights to 150 miles; a second will investigate solar x-ray and Lyman-alpha emissions.

The Army Ballistic Research Laboratories plan to send up two Nike-Cajun rockets from Fort Churchill—in cooperation with Canadian scientists and the Government of Canada—and two specially assembled five-stage rockets from Wallops Island. The shots in Canada will be used to determine water-vapor content of the atmosphere from 18 to 60 miles up, while those at Wallops Island will measure charge densities at between 50 and 1000 miles. The latter altitude range includes the ionosphere, the charge density of which



The U.S. Weather Bureau collects data for International Geophysical Cooperation–1959. Here a bureau observer holds an airborne rawinsonde assembly, consisting of a balloon, parachute, and rawinsonde transmitter. The Fiberglas dome in the background houses the rawinsonde receiver.

governs the reliability of radio transmissions.

The Air Force Geophysics Research Directorate expects to send up a magnetometer in an Aerobee rocket that will be launched at Fort Churchill, while two rockets from Eglin Air Force Base, Fla., will carry instrumentation for micrometeorite experiments.

The Naval Research Laboratory will take part with an Aerobee rocket from White Sands, N.M., carrying equipment designed to record with high resolution a portion of the solar spectrum.

Each participating nation is expected to inform COSPAR of its International Rocket Week plans, for circulation to other participating nations. The week should produce valuable data on the world's upper atmosphere during a specified time period.

United States Participation

This country's participation in IGC consists of (i) contributed efforts from public and private institutions; (ii) two major programs on antarctic research and space science; and (iii) a small group of projects which were recommended by the IGY Committee and which are supported by the National Science Foundation. The contributed efforts include data-gathering by networks of stations such as those operated by the Weather Bureau and the National Bureau of Standards. Of the two major programs, that on antarctic research is supported by the National Science Foundation and the Navy, and that on space science is supported by the National Aeronautics and Space Agency and other government agencies.

The United States is operating 478 IGC stations on its own, and 204 on a cooperative basis with other countries. At the cooperative stations, the U.S. supplies equipment or personnel, or both. Brief notes on the programs planned in each of the IGC–59 disciplines or areas of special study follow.

Earth's Heat and Water Budget

Meteorology. Surface and upper-air meteorological observations are being made at 170 stations operated by the United States, and at 27 stations operated in cooperation with other countries. Special measurements of carbon dioxide and ozone concentrations in the atmosphere are being made at some stations, and some work is being done on oceanographic research vessels on the exchange of CO_2 between sea water and air.

In the Arctic Basin, a new floating station, Station C, has been established to take the place of Station A, which had to be shut down last year. At Station B (on Fletcher's Ice Island, or T-3) special surface observations, including carbon-dioxide and solar-radiation measurements, are continuing, while at Station C a full meteorological program, including upper-air soundings, is under way.

Glaciology. Continuing arctic glaciological work includes study of the behavior of glaciers in southern Alaska; study, in cooperation with Denmark on the Greenland icecap, of movement and ice mechanics, as well as tests of deep-drilling techniques for subsequent use in the antarctic; and, on the two floating stations, study of stratigraphy and petrofabric of the ice pack and the heat budget of the Arctic Ocean ice-sea-atmosphere system.

Among other projects in the United States, glaciologists reoccupied for the summer a station on Blue Glacier in Olympic National Park, to continue study of the mass and energy regimen of the glacier, the mode and mechanism of flow in the ice tongue of the glacier, the internal structure, and oxygen-isotope ratios.

Oceanography. Twenty-six U.S. and 11 cooperative stations are being operated in the oceanography program. Ship operations are being conducted in both the Pacific and the Atlantic, while profile studies in the Atlantic and study of current systems in the Pacific are being continued.

Marine geophysical studies are continuing at Drifting Station B, in the Arctic Basin, and oceanographic studies similar to those carried out at Station A during the IGY are continuing at the new drifting station, Station C.

With the cooperation of such groups as this country's Committee on Oceanography of the National Academy of Sciences, ICSU's Special Committee for Oceanic Research has developed definite plans for making further studies of the oceans, to culminate in an international cooperative investigation of the largest unknown area on earth, the 28,350,000-square-mile Indian Ocean, throughout a complete monsoon period in 1962–63.

Nuclear radiation. At 148 stations operated by the United States, and at 69 stations operated in cooperation with other countries, measurements of the radioactivity of the air, of solid particles deposited on the ground, and of precipitation at the earth's surface are being continued.

Upper Atmosphere, Sun, and Space

World Days. As part of the International World Days Service, the IGY World Warning Agency operated at Fort Belvoir, Va., by the North Atlantic Radio Warning Service of the National Bureau of Standards is now known as the World Warning Agency. The WWA issues IGC alerts and announces Special World Intervals. As during the IGY, a program of Regular World Days is also under way.

Airglow. At three U.S. stations, and at two stations cooperatively operated with other countries, automatic scanning photometers are in use. Launching of rockets carrying airglow observing equipment is another aspect of IGC–59.

Aurora. At 20 stations, all-sky cameras are continuing to photograph the aurora every minute. All-sky cameras are also in operation at nine stations cooperatively maintained by the United States and other countries. A new type of all-sky camera is being used in Alaska to determine auroral heights by triangulation as a part of broad spectroscopic studies of auroral phenomena and their dependence on height.

Visual, radar, and spectroscopic observations of the aurora are continuing at many locations. Altogether, there are 26 stations being operated by the United States in the aurora program for IGC–59, and 18 stations that are being operated cooperatively with other nations.

Cosmic rays. In the field of cosmic rays, 14 U.S. and six cooperative stations are in operation. Four institutions are conducting balloon observations in the United States and Canada. Rockets and several satellite vehicles have carried cosmic-ray equipment. An airborne neutron monitor is being used to survey the geomagnetic equator and to study latitude variations of cosmic-ray intensity. Neutron monitors, ionization chambers, and meson telescopes are being operated at many stations for continuous registration of cosmic-ray intensity.

Geomagnetism. Twenty-one stations are being operated by the United States

alone, and seven are being operated in cooperation with other countries, including four in Peru with the cooperation of the Instituto Geofisico de Huancayo. The regular United States magnetic observatories are continuing to supply data to the World Data Centers during IGC–59. The special networks established during the IGY to study the equatorial electrojet and sub-audio signals and their relationships to magnetic storms are also continuing operations.

Ionospheric physics. Thirty U.S. and 41 cooperative stations are being operated in the U.S. IGC–59 ionospheric-physics program. Vertical soundings are taken every 15 minutes with modern ionosondes, and more often on Regular World Days and during Special World Intervals. There will be continued studies of backscatter, transequatorial propagation, radio noise, whistlers, and ionospheric absorption of extra-terrestrial radio signals, and several groups will observe and analyze ionospheric effects upon satellite radio signals.

Solar activity. Thirteen stations are being operated by the United States in this program, which includes continuation of optical patrols of the sun's corona, plages, flares, sunspots, and active-region magnetic fields, supplemented by solar-radio-noise patrols and radio spectroscopic observation. Expeditions to Fuerteventura, in the Canary Islands, and to French West Africa, observed the total solar eclipse of 2 October 1959. The solar-activity program also includes special rocket experiments.

Space science. The United States' contribution to IGC–59 in space science is being made by several agencies through the Space Science Board. Results of appropriate launchings are expected to be made available to the World Data Centers and to ICSU's Committee for Space Research. The U.S. space-science program has been placed on as broad a basis as possible. By the end of 1959, about 75 sounding rockets and several satellites and space probes will have been launched as a contribution to IGC–59.

The satellite and space-probe contribution is largely being made by the National Aeronautics and Space Administration.

Contributions to the rocket sounding program are being made by many public and private institutions. Emphasis is being placed upon experiments relating to atmospheric structure, electric and magnetic fields, astronomy, energetic particles, and the ionosphere. The coming World Rocket Week is part of this program.

Earth's Shape, Crust, and Composition

Seismology. Most of the IGY network seismological stations have continued functioning during IGC–59. Two Benioff extensometers, or strain seismometers, are being operated in Chile and in Peru as cooperative programs; they are used to determine the strain pattern of the region. The program for studies of the structure of the earth's crust under the Andes is being extended to include a network for observations of local and regional earthquakes.

Gravity. Gravity determinations by United States groups are assisting in completion of a world network; gravity measurements made at sea by means of the Graf sea gravimeter and pendulum equipment are also being continued.

Longitudes and latitudes. During IGC–59 the U.S. Naval Observatory has continued to be the central agency for the moon-position program. Photographic observations of the moon, made with the dual-rate camera, and determination of astronomical longitudes and latitudes by means of the Danjon impersonal astrolabe are continuing at three stations—in Washington, D.C., in San Diego, and near Honolulu.

Antarctica

The United States program for scientific research in the antarctic during 1959 was developed by the NAS Committee on Polar Research in collaboration with various federal and private agencies in the United States. The program is being carried out under the direction and coordination of the National Science Foundation. Logistic support is furnished principally by the United States Navy. Coordination with international plans for continued cooperation in antarctic research has been effected through the National Academy's participation in the deliberations of ICSU's Special Committee for Antarctic Research.

The U.S. IGC–59 program in Antarctica includes projects in aurora, cosmic rays, geomagnetism, ionospheric physics, glaciology, meteorology, and oceanography. In addition, special programs are being conducted in geology, geodesy, cartography, and the biological and medical sciences.

Two United States antarctic stations, the Byrd and Pole stations, are staffed fully by American personnel. Hallett Station and the Scott-McMurdo complex have joint New Zealand-United States staffs. Wilkes Station and Ellsworth Station have Australian and United States personnel, respectively.

World Data Center A

World Data Center A continues as one of the three data centers set up during the IGY. World Data Center B is in the U.S.S.R., and World Data Center C is in Western Europe, Australia, and Japan

Center A was established in 11 institutions in the United States in accordance with the academy's belief that the interests of science would best be served by housing the data in institutions with histories of scientific interest and competence in particular geophysical disciplines. Data collected during the U.S. IGC–59 program will be collected in Center A and will be exchanged with the other World Data Centers.

Moon Pictures Show "Monotonous" Other Side

The Soviet Union has succeeded in taking a "considerable number" of photographs of the far side of the moon. The pictures were made during a 40-minute period when the satellite, Lunik III, was about 40,000 miles beyond the moon. After being processed in the satellite, the photographs were transmitted to the earth by what the Soviet news agency Tass called a "photo television" apparatus. The opinion of scientists on the value of the pictures released to date varies, but no one has questioned their authenticity.

The release of one of the moon pictures last week answers the questions that became current during the satellite's long first orbit of the earth and the moon. Although reports at the time of launching indicated that photographic equipment was being carried by the satellite, no confirmation or denial of this point was made by Soviet authorities. At the time, the suggestion was made that the Soviet Union was being cautious as usual, to avoid the possibility of having to acknowledge failure.

Exercising its prerogative, the Soviet Union immediately assigned a special committee of its Academy of Sciences to name the various features of the moon's far side revealed in the photographs. The surface, although generally