News of Science

Earth Satellite

Plans for the construction of a small, unmanned, earth-circling satellite vehicle to be used for basic scientific observations during the forthcoming International Geophysical Year (IGY) were announced at the White House on 29 July by Detlev W. Bronk, president of the National Academy of Sciences, and Alan T. Waterman, director of the National Science Foundation. Scientists expect to complete the satellite developmental work in time for a successful launching of one or more vehicles during the IGY, a period selected during 1957 and 1958 for world-wide observations in the fields of the earth sciences by some 40 nations.

The satellite program was initiated in compliance with a resolution passed by the Special Committee for the International Geophysical Year (the "CSAGI") at its Rome meeting in Oct. 1954. The resolution reads: "In view of the great importance of observations during extended periods of time of extraterrestrial radiations and geophysical phenomena in the upper atmosphere, and in view of the advanced state of present rocket techniques, CSAGI recommends that thought be given to the launching of small satellite vehicles, to their scientific instrumentation, and to the new problems associated with satellite experiments, such as power supply, telemetering, and orientation of the vehicle." Similar resolutions were adopted in Sept. 1954 at meetings of the International Union of Geodesy and Geophysics and the International Scientific Radio Union.

The satellite, intended specifically and entirely for scientific uses, is being developed with the technical advice and assistance of scientists who have long been engaged in research on the upper atmosphere. The White House announcement said that the Department of Defense will provide the required equipment and facilities for launching.

Formal notification of the inclusion of the satellite project in this country's IGY program was communicated to Sydney Chapman, president of CSAGI, by Joseph Kaplan, chairman of the U.S. National Committee for the IGY. Kaplan wrote: "The participation of other nations engaged in the International Geophysical Year program is invited, and to this end we shall provide full scientific information on the orbiting vehicle so that other nations may monitor the device and make appropriate observations."

Once established in its orbit, the satellite will be able to telemeter information to earth about conditions in the outer edge of the atmosphere. It can also report on extraterrestrial radiations and particles that are shielded by the earth's atmosphere—ultraviolet radiation, cosmic rays, meteors, and so forth—that have a strong influence on the upper atmosphere and indirectly affect the lower atmosphere.

In the past, vertical rocket flights to extreme altitudes have provided considerable information about the upper atmosphere, but such flights are limited to very short periods of time. Only by use of a satellite can sustained observations in both space and time be achieved. Plans are being made for a basketball-sized vehicle that will orbit around the earth for a period of days at a height of 200 to 300 mi and at a velocity of 18,000 mi/hr, gradually circling back into the upper atmosphere where it will eventually disintegrate harmlessly.

The satellite project is one important part of the United States plans for scientific work during the IGY, when scientists will conduct the most comprehensive study of the earth ever undertaken. Intensive investigations throughout the world will be carried out in meteorology, latitude and longitude determinations, geomagnetism, gravity measurements, ionospheric physics, aurora and airglow, solar activity, cosmic rays, glaciology, oceanography, seismology, and rocket exploration of the upper atmosphere.

Each of the fields in the program is characterized by its global nature, and many are related to solar-energy fluctuations and disturbances. There will be special emphasis on observations from locations that are usually inaccessible, such as Antarctica—and now from satellites. Measurements must be made simultaneously so that the relationships between fields can be determined on the basis of world-wide coverage.

The list of nations that will participate in the IGY program includes: Argentina, Australia, Austria, Belgium, Brazil, Burma, Canada, Chile, Czechoslovakia, Denmark, Finland, France, East Germany, West Germany, Great Britain, Greece, Hungary, Iceland, India, Ireland, Israel, Italy, Japan, Mexico, Morocco, Netherlands, New Zealand, Norway, Pakistan, Peru, Philippines, Spain, Sweden, Switzerland, Thailand, Tunisia, Union of South Africa, U.S.S.R., United States, and Yugoslavia. Each country will plan and execute its own program, under a general plan developed and coordinated by the Special Committee for the International Geophysical Year.

The U.S. National Committee for IGY, established by the National Academy of Sciences, is in charge of planning, directing, and executing this country's program. The committee and its technical panels, which include many of the nation's leading geophysicists, have developed the program in cooperation with a number of universities, institutions, and agencies. Federal sponsorship and support has been obtained by the committee through the National Science Foundation.

Secrecy in the Sky

The following excerpts are drawn from an editorial entitled "Secrecy in the Sky" that appeared in the 4 Aug. issue of the *New York Times*.

"A few Senatorial voices have been raised to protest against the President's intention to tell the world . . . what information may be telemetered to ground stations by the artificial satellites that are to be sent up in 1957 or 1958. . . . For years we clung to secrets that were no secrets at all. If we paid any attention to the protesting Senators, our physicists and engineers would have nothing to say at the atoms-for-peace conference in Geneva . . .

"If the Soviet Union plants a satellite in the sky . . . it will find out as much as we can about the frontier of outer space. . . .

"It would be a mistake not to publish all that we may discover about the conditions that prevail 250 miles away from the earth, even though something of indirect military use may be important. More important is the preservation of the spirit that the President infused in the recent "summit" conference at Geneva. His willingness to pool our knowledge of the atom with that of other nations for mankind's benefit, the emphasis that he has laid on the peaceful uses of the atom and now his proposal to make the knowledge to be gained by an artificial satellite common property, is all in the high tradition of science.

"Too long have scientists been muzzled by following a policy of secrecy necessary only as far as strictly military matters are concerned. The President has taken an immense forward step by restoring freedom of scientific discussion to its old state."