

GEOPHYSICS

First U.S. "Moon" Report

A mysterious radiation has been discovered through the scientific probings of Explorers I and III along with important findings in space temperature and atmosphere density.

► THE FIRST reports on findings from the first two U. S. satellites have been announced by scientists of the International Geophysical Year program. They included:

A mysterious radiation so powerful it blanked the cosmic ray recorders was discovered at heights greater than 660 miles above the earth's surface. Source of this radiation is unknown, but its intensity is such that human beings would be exposed to the highest permissible weekly dose within five hours.

Adequate temperature control for sensitive instruments inside a satellite can easily be obtained by coating the vehicle with strips of a heat-radiating chemical. Success of this technique indicates temperatures inside larger satellites, such as those containing humans, could readily be kept within livable limits.

The number of micrometeorites, tiny dust-like particles in space, is about as expected. Only seven particles were detected by the microphone, and after 32 days not more than one of the tiny gauges registered the direct impact of a micrometeorite. The average number of particles ten microns (one micron is one-thousandth of a millimeter) or more in diameter in the vicinity

of earth during a 32-day period is not more than one over each 3,300 square feet every second. Particles four microns or larger were measured at the rate of one per 330 square feet each second.

The atmosphere at a height of 220 miles has a density of about two ounces per cubic mile. This is about 14 times the density of about one-seventh of an ounce per cubic mile that had been predicted at such altitudes in pre-satellite days.

The probable lifetime of Explorer I is about five years, compared with 92 days for Sputnik I and some five months for Sputnik II.

These and other details concerning the scientific space probings of Explorers I and III, officially known as 1958 alpha and gamma, were reported to a special joint meeting at the National Academy of Sciences and the American Physical Society in Washington.

The report on cosmic rays was made by Dr. James A. Van Allen for his group at the State University of Iowa; on satellite temperatures by Dr. A. R. Hibbs of California Institute of Technology's Jet Propulsion Laboratory; on micrometeorites by Dr. Edward Manning of the Geophysics Re-

search Directorate, Air Force Cambridge Research Center; on orbital calculations by Drs. Joseph W. Siry of the Naval Research Laboratory and G. F. Schilling of the Smithsonian Astrophysical Observatory, Cambridge, Mass. Dr. Schilling's report was based on orbital studies made by Dr. Charles A. Whitney and Dr. Theodore E. Sterne, also of the Smithsonian.

Dr. Van Allen and his colleagues at the State University of Iowa calculate that if the satellite's cosmic ray geiger tube had not been jammed by an intense radiation field, it would have registered at least 35,000 counts per second. They believe this radiation is closely related to the soft radiation previously detected during rocket flights in the auroral zone.

The radiation intensity necessary to blank the geiger tube is equivalent to 60 milliroentgens an hour, or three-tenths of a roentgen in five hours or less. The recommended permissible dose for humans is three-tenths of a roentgen per week. The roentgen is a unit for measuring radiation.

The energy of this radiation, they suggest, may contribute significantly to the heating of the high atmosphere. The particles causing it are believed to be initially associated with huge masses of ionized gas encountered by the earth in its journey through space.

Drs. Fred L. Whipple and J. Allen Hynek, respectively director and associate director of the Smithsonian Astrophysical Observatory, pointed out that since Oct. 4, 1957, eight objects have been sent into earth-circling orbits. Only the efforts of thousands of persons made possible tracking all of them.

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Satellite "Bubble" Test-Launched

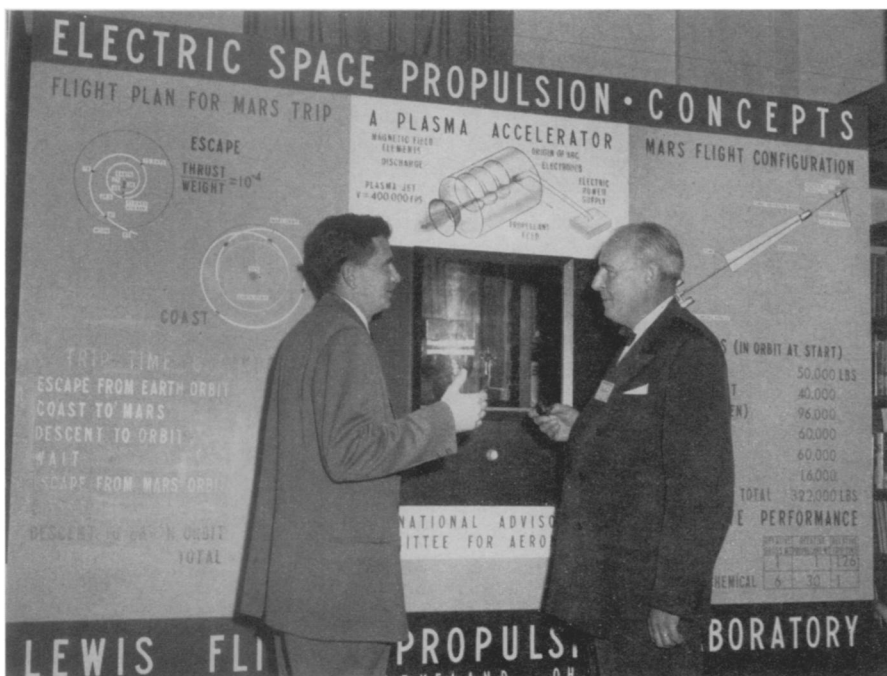
► A 12-FOOT "bubble" of air such as will be put into an earth-circling orbit from an Explorer satellite was successfully test-launched to a height of 50 miles by the National Advisory Committee for Aeronautics.

Dr. Hugh L. Dryden, NACA director, reported the devices to open and inflate a nine-pound package to a 12-foot balloon worked successfully. He told a joint meeting of the American Physical Society and the National Association of Science Writers the balloon was tracked by radar for more than an hour, then it was whisked away over the ocean by the jet stream.

The sub-satellite was carried to the 50-mile height above Wallops Island, Va., by a four-stage solid propellant rocket on April 25. Then the plastic balloon was inflated with air to iron out the wrinkles in its skin, which has a very thin coat of aluminum foil. The air is then released so the balloon will not be punctured.

Dr. Dryden said the NACA was also planning to build an aluminum-coated plastic bubble that would be 100 feet in diameter when inflated. Such a large, inert satellite, he said, would be very useful for studying the possibilities of satellites as communications stations, and it would also be easily visible to the naked eye.

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ACADEMY EXHIBIT—Stanley Domitz of the National Advisory Committee for Aeronautics, and Dr. Lloyd V. Berkner, president of Associated Universities, Inc., and a member of the U. S. National Committee for IGY, discuss an exhibit on space propulsion at the National Academy of Sciences meeting in Washington, D. C. (See pp. 293-95 and 297.)