

## SPACE

# Transits Measure Earth

► SCIENTISTS need to know more exactly the shape of the earth in order to track and use accurately the Transit satellites that will help ships and aircraft find their position on the globe.

This will take about a year, using both the experimental Transit satellites IV-A and IV-B now circling the earth, Dr. Richard B. Kershner, supervisor of the space development division, Johns Hopkins University Applied Physics Laboratory, Silver Spring, Md., told SCIENCE SERVICE.

He said the two satellites complement each other. Because of the angle relative to the equator at which they travel around the earth, Transit IV-A, launched June 29, 1961, can be used more frequently to find positions in high latitudes whereas Transit IV-B, launched Nov. 15, will cover equatorial regions. It is now possible to find one's position on sea, land or in the air at least two times every day anywhere on earth.

Transit satellites IV-A and IV-B are both carrying chemical and nuclear batteries that are being tested as power systems for the four operational Transits to be launched about a year from now. Both batteries of Transit IV-A, the first nuclear-powered satellite, are still operating.

The nuclear batteries, which contain the radioisotope plutonium-238, are being tested because they have a longer "life" than chemical batteries.

A satellite, Traac (Transit Research And Attitude Control), for testing systems to control the direction a satellite is pointing was launched with the Transit IV-B.

When this control is achieved antennas or cameras of satellites can be turned toward the earth, signaling or taking pictures constantly. This will make a satellite far more efficient.

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## SPACE

# Space Effects on Fertility

► THE EFFECTS of weightlessness on fertility and natural radiation damage of human chromosomes will be studied when a second attempt is made to launch a new scientific space capsule, Bios I.

The probe, launched unsuccessfully on Nov. 15, from the Pacific Missile Range,

Point Arguello, Calif., was scheduled to make a flight through the inner Van Allen radiation belt before returning to earth.

The 136-pound vehicle will be weightless for 25 minutes. During this time a special capsule will be triggered to expose sea urchin eggs to sperm for fertilization.

Single cell divisions in urchin eggs, which is completed in one to two minutes, will also be attempted, the National Aeronautics and Space Administration reported.

The effects on human chromosomes of natural radiation trapped in the Van Allen belt will be studied by exposing blood samples during the flight.

Bacteria commonly found in human intestines will also be carried in the recoverable capsule to learn if they will grow and develop normally after exposure to the radiation. Genetic radiation studies with mold neurospora and experiments with grasshopper nerve fiber in early stages of development to find how chromosomes in cells are broken due to radiation will be made.

Bios I, short for Biological Investigation of Space, will also measure impacts of micrometeoroids.

An additional experiment will be to explore the characteristics of the Van Allen belt with nuclear emulsion, consisting of silver bromide grains embedded in gelatin.

This emulsion will record the passage of any charged particle that has enough speed to penetrate. When processed, the emulsion shows the charge, mass and velocity of the particles and the direction in space in which they were traveling.

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## METEOROLOGY

## Arctic Expedition Finds Record of 1945 Fallout

► A RECORD of radioactive fallout from the 1945 atomic bursts over Hiroshima and Nagasaki is believed to have been found embedded in an icecap in northern Ellesmere Island, Canada's northernmost territory.

Glaciologist Dr. Geoffrey Hattersley-Smith of the Canadian Defence Research Board says he took ice samples from a 50-foot hole he dug in the icecap, melted them down and sent them to the atomic plant at Chalk River, Ontario, for analysis.

He said the sample of 1945-46 snowfall is expected to show the density of fallout from the atomic blasts over the twin Japanese cities.

From the bottom of his 50-foot ice pit, dug with pick and shovel, Dr. Hattersley-Smith obtained an 80-foot bore, giving him a climatological record of more than 100 years. He says there is some indication summers have been slightly warmer in the last 20 years.

The expedition found fossilized plants believed to be several hundred million years old—the oldest ever found in the Arctic—and wood judged tens of millions of years old. The tree wood was found on a rock outcrop at the 4,000-foot level of the Gillman glacier.

The finds confirmed the theory that ages ago Arctic Canada was tropical or subtropical. On an earlier expedition, Dr. Hattersley-Smith found coral in the same region.

The expedition also helped the U.S. Air Force find suitable aircraft emergency landing strips.

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**LOADING BIOS I**—A NASA engineer places plastic foam in Bios I as padding for the small capsules containing biological experiments.