Physical Sciences Notes

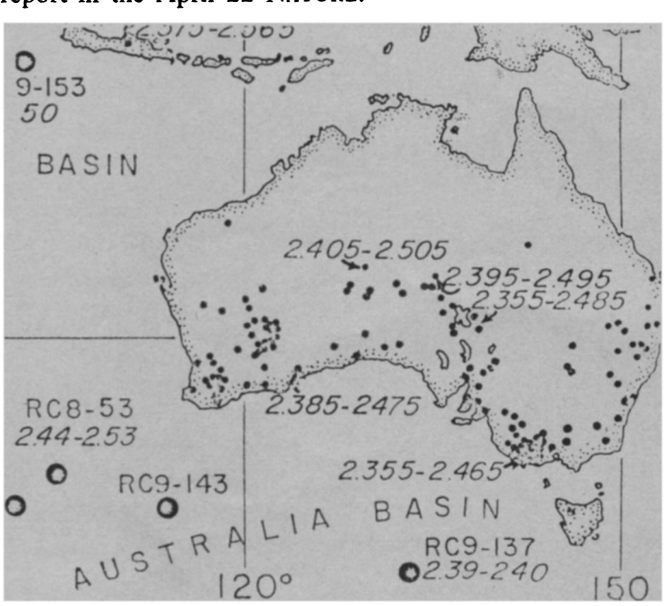
PLANETARY SCIENCE

Ancient Blast Postulated

Investigation of deep-sea sediments from south of Australia reveals that hundreds of small glassy objects occurring in a thin layer were deposited immediately after the last reversal of the earth's magnetic field, some 700,000 years ago.

The microtektites were found in cores taken from the oceans adjacent to the Australasian tektite field, which extends from Thailand to Tasmania. The discovery that the Australasian tektite fall coincided with the last reversal of the geomagnetic field suggests a common cause.

The cause could well be the explosion of a cosmic body in midair before striking earth some 700,000 years ago, Drs. Bruce C. Heezen and Bill Glass of Columbia University's Lamont Geological Observatory report in the April 22 NATURE.



INTERNATIONAL COOPERATION

CERN-U.S.S.R. Discussions Held

During the period from April 10 to April 15 negotiations were held in Moscow between the State Committee for Utilization of Atomic Energy and CERN, the European organization for nuclear research, on scientific and technical cooperation in the field of high energy physics at the Serpukhov accelerator.

Representatives of both groups evidenced interest in conducting joint research projects using the 70 billion electron volt accelerator, which is expected to be operating at its designed strength by the end of the year.

In a so far unrelated development, the Soviets have announced completion of a one Bev model for a 1,000 Bev alternating gradient proton synchrotron.

NUCLEAR PHYSICS

New Isotope of Helium

The question of the creation and stability of helium 7 has been of interest to physicists for many years, but previous attempts to isolate it have proved unsuccessful.

Now scientists at Los Alamos Scientific Laboratory in New Mexico have created this new isotope of helium by bombarding lithium 7 with helium 3 particles using the 22 million electron volt triton beam from the Laboratory's three-stage tandem accelerator.

The lithium target was 99.99 percent pure, Drs. Richard H. Stokes and P. G. Young report in the April 10 PHYSICAL REVIEW LETTERS.

BIOPHYSICS

Control of Photosynthesis

Red and far-red light can be used to control the rate of photophosphorylation, a key step in photosynthesis, a research group at the University of California, Berkeley, has determined.

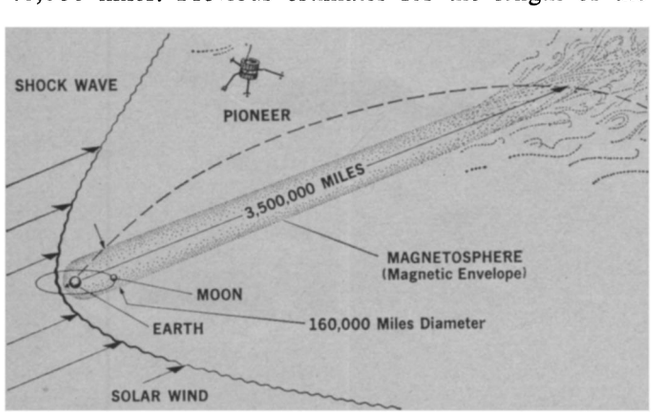
Dr. Daniel I. Arnon told the National Academy of Sciences meeting in Washington the Berkeley team has found that cyclic and noncyclic photophosphorylation are distinct photochemical processes, responding differently to red light. Both processes depend on ferredoxin for activation. The two processes together account for the major transformations of light energy into chemical energy that make up the first steps of photosynthesis (SN: 4/29).

PLANETARY SCIENCE

Earth's Wake in Space

Earth leaves a cigar-shaped wake in space 3.5 million miles long when the solar wind strikes this planet's magnetic field. The wind flows around the magnetosphere.

Satellites have measured the distance from earth's surface to the magnetic boundary on the sun-side as about 40,000 miles. Previous estimates for the length of the downwind boundary have varied from as close as the moon, about 240,000 miles away, to as far out as 100 million miles.



Information gathered by Pioneer 7 shows that the magnetosphere ends at about 3.5 million miles from earth in the direction away from the sun. This new distance for the lee-side magnetosphere was reported to the American Geophysical Society meeting in Washington by Drs. Norman F. Ness and Leonard F. Burlaga of the National Aeronautics and Space Administration's Goddard Space Flight Center, Greenbelt, Md.

The path of Pioneer 7, launched last August, was tailored to try to locate the downwind magnetosphere. Measurements made from other satellites have shown that the "cigar" has a diameter of some 160,000 miles at the distance of the moon.