

ASTRONOMY

Birth of Cosmic Rays

New theory suggests they may originate close to the earth where radiations from the sun strike local clouds of cosmic dust.

► SHOWERS of cosmic rays may be born close to the earth where radiations from the sun strike local clouds of cosmic dust, the stuff from which meteors are made. This theory, making cosmic rays a local phenomenon, was presented by Dr. Donald H. Menzel of Harvard College Observatory at the meeting of the National Academy of Sciences.

Cosmic-ray showers are created out of local clouds of ions found in space within a few million miles of the earth. Long-wave radiations from the sun give these ions energies as great as 100,000,000,000 volts. The neutron component of the cosmic rays comes from the splitting of heavier atoms into neutron-proton constituents as cosmic rays encounter the earth's atmosphere, Dr. Menzel said.

Thus cosmic rays come in groups

rather than one or two at a time, the studies of Dr. Menzel and Winfield W. Salisbury indicate. Their research offers a theory that not only interests cosmic ray experts, but offers a good working theory that may also aid study of the ionosphere, radio-echoing layer of atmosphere surrounding the earth.

Fluctuations of the sun, associated with the gustiness and turbulence of the solar atmosphere, cause radio noises of very low frequencies that are sometimes heard here on earth. Because of their long wavelengths, these radiations can escape from the sun, especially in regions where magnetic fields reduce the conductivity. The energy is also known to penetrate the ionosphere.

The radio waves responsible for the cosmic rays also produce other effects,

the Harvard astronomer pointed out. They cause appreciable heating of the solar atmosphere, and lead to the million-degree temperature of the solar corona. The emission exerts a cooling action on sunspots. The light of the night sky and aurora borealis are electrodeless discharges in the electric field of the radiation. Other effects include certain types of ionospheric disturbances and the existence of a potential gradient in the earth's atmosphere.

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ICHTHYOLOGY

Submerged Lights Lure Fish into New Jap Net

► ACUTE food needs in Japan are responsible for the newest thing in commercial fishing: the use of a string of submerged electric lights to lure fish into a trap or pound net. It makes possible several hauls per night, instead of the single haul that could be made by the old traditional method, of which it is a modernized modification.

In the old fixed-net method, a pair of great, fence-like nets, each from 200 to 500 feet or more in length, are set at an angle to the shore. At their junction is a trap net, into which they lead the fish. These long wing nets are of course very costly and require a lot of hard labor in setting.

In the new method, the wing nets are dispensed with. In their place, a long line of 300- or 400-watt electric lamps is strung out from the shore to the trap net. The lamps are kept about 10 feet under the water and are spaced about 60 feet apart. Each lamp illuminates a water area from 175 to 200 feet in diameter.

After dark, the lamps are all turned on, and each of course attracts its school of fish. After about two hours, the lamp nearest shore is extinguished, and its fish immediately desert it for the next bright spot down the line. After two minutes, this lamp is also turned off, and the performance is repeated until only one lamp is left lighted—inside the trap net. Then the fishermen pull the mouth of this net shut and haul in the fish.

The new fishing method was developed for the Ministry of Agriculture and Forestry by the Nishina Laboratory of the Institute for Physical and Chemical Research. Tests were conducted at the Marine Experimental Station on the beach at Sumoto in the Hyogo prefecture.

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CONFER—The four contributors to the symposium on protein structure at the fall meeting of the National Academy of Sciences are examining models of protein molecules. They are left to right: Dr. John L. Oncley, Harvard Medical School, Dr. Alexander Rothen, Rockefeller Institute for Medical Research, Dr. David Harker, General Electric Co., and Dr. Robert B. Woodward, Harvard University.