

ASTRONOMY

Radiation Polar Caps

A pair of radiation "caps" may be located over the North and South Poles. The theory has yet to be proved by satellite experiments.

➤ A PAIR of radiation polar caps are believed to "hang" over the North and South Poles.

These radiation zones are formed by particles from the sun that circulate around the polar axes. The radiation is believed to be strongest closest to earth and decrease outward, Drs. G. Sprague and C. W. Gartlein of the IGY Auroral Data Center, Cornell University, Ithaca, N.Y., told SCIENCE SERVICE.

The scientists said the radiation caps are similar to the Van Allen radiation belts circulating high above the earth like a big doughnut from about 40 degrees north to 40 degrees south latitude. Both are made up of particles, protons, from the sun deflected by the earth's atmosphere. In the polar regions such particles are responsible for the magnificent displays of northern lights, or auroras.

Drs. Sprague and Gartlein's theory about the aurora is that radiation areas must be present at about 20,000 miles above each pole. The hypothesis still has to be proved from satellite information about the travel of protons to earth and the formation of the radiation area, the scientists said. They believe auroras come down in the region between the Van Allen belts and the polar radiation caps.

The ideal satellite to find out something more about aurora protons should have a polar orbit (circle the earth over the poles)

and be able to count particles of low energies. Most of the satellites now going up can only count particles of high energy, they said.

The satellite should also have a "window" of tinfoil, thin enough to let the particles through and thick enough to keep the atmosphere out. This kind of an arrangement is difficult to manage, they said, as the "window" will break very easily.

The two scientists get first hand information about auroras from amateur observers living all over the northern United States. It is important that such observers watch for auroras regularly and send information to the IGY Data Center as some information, for example about the blue light in auroras, can only be gathered by human observers. Much correlated information is

METEOROLOGY

Computer Plots Storms

➤ A COMPUTER has been working overtime these days predicting with fairly good accuracy the paths of hurricanes.

Paths of Hurricanes Carla, Debbie and Esther have been predicted as far in advance as four days with a relatively small percentage of error, Maj. Lloyd W. Vanderman of the U.S. Air Force's Air Weather Service told SCIENCE SERVICE. The weather

necessary about each display.

However, at the present time magnetic storms on the sun, which cause the particles to be flung out in space toward earth, are decreasing and solar activity will be less and less until about 1965.

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CHEMISTRY

New Products Made From Fluorosilicones

➤ DEVELOPMENT of the first commercially marketable line of fluorosilicones, semi-inorganic chemical products that resist heat, cold and oxidation, was reported by Dow Corning Corporation, Midland, Mich.

Fluorosilicones are chemical cousins to the silicones used widely during the past ten years as oils, greases and plastics. The basic difference is that in fluorosilicones, fluoroalkyl groups are substituted for some of the methyl groups in standard silicones. This is said to produce compounds with the additional properties of good solvent resistance and improved lubrication qualities.

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AUTOBANKER—The latest in drive-in banking is a closed-circuit television and pneumatic-tube system that allows "long distance" money exchange and conversation between customer and teller.

computer program, still in the experimental stage, may someday replace the present laborious method of predicting hurricane paths by manual computation.

All hurricanes except Alice were tracked this year by the computer. The scoreboard showed good results with Hurricanes Carla, Debbie, and Esther and a fair showing with Hurricane Betsy. The computer pinpointed the Texas coast as the target for Hurricane Carla four days before it hit with devastating fury.

The speedy computer needs only the size of the hurricane's eye, wind speeds at the eye's edge and the hurricane's position to start plotting the probable path. U.S. Weather Bureau meteorologists working with the computer use a "working model" of the large-scale circulation of the atmosphere to guide the computer.

A 96-hour forecast can be obtained from the "model" in 15 minutes, Maj. Vanderman said. The Air Force scientist has been working on the project with the U.S. Weather Bureau for the last three years.

The forecasts are sent twice daily over the hurricane circuit to weather centers. Although the method still has room for improvement, it is possible that a computer in the near future will be telling coastal residents a few days ahead of time to evacuate the lowlands when a hurricane is coming.

Studies conducted on an earlier "working model" showed that the computer was about 120 miles off in a 24-hour forecast. The present model, which is still experimental, the scientist cautioned, is probably at least 25% more accurate.

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