GEOPHYSICS

Excess Electrons Cause Polar Radio Blackouts

TRILLIONS UPON trillions of wandering free electrons in the lowest layer of the ionosphere probably cause the polar radio blackouts that disrupt communications in Arctic regions.

Man's activities, and his safety, in the Arctic depend greatly on reliable radio contact, which sometimes becomes impossible on any frequency. Such disrupted communications occur when radio waves are completely absorbed in the ionosphere, the electrically charged layer of the earth's upper atmosphere that reflects radio waves.

Drs. J. C. Seddon and J. E. Jackson of the U. S. Naval Research Laboratory report to the U. S. National Committee for the International Geophysical Year (IGY) that the first measurements of electron density during a polar radio blackout were made by two rockets launched from Fort Churchill, Canada. Information telemetered earthward from these two rockets flights, plus a third, furnish "very strong evidence that a polar blackout is due to an abnormal number of free electrons in the D-region of the ionosphere."

They also report that moving electric charges play an important role in this effect. The polar blackout seems to involve little change in the E- and F-regions of the day-time ionosphere.

Science News Letter, March 28, 1959

Questions

ASTRONOMY—What is an annular eclipse? p. 202.

BIOCHEMISTRY—Where in the body is the melanocyte stimulating hormone naturally produced? p. 197.

PUBLIC HEALTH—How long does it take normal weather processes to remove radioactive debris from the troposphere?p. 199.

Photographs: Cover, George A. Smith; p. 195, U.S. National Committee-International Geophysical Year; p. 197, California Institute of Technology; p. 199, General Electric Company; p. 208, Eastman Chemical Products, Inc

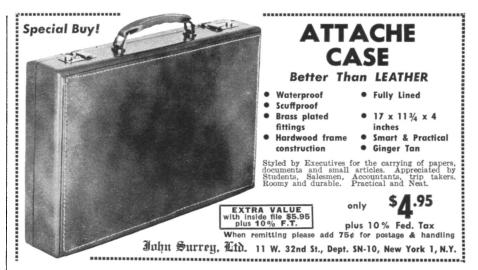
Do You Know

Four states in the U.S., Nevada, Arizona, California and Florida, are expected to have the largest *population* growth between 1955 and 1970.

A U.S. agriculturist recently estimated that the cost of *farm labor* in the U.S. has increased about 400% in the last 25 years.

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Jobs open to *physicists* outnumber available candidates about five to one in the U.S.



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What common mistakes do you make on flooded roads, on icy hills? What do you do when a car darts out at you from a side road? Do you know how to stop a car FASTER when emergency demands you stop on a dime? Do you know how to avoid a sideswipe, pass a truck crawling up a hill, even what to do in that split second you can act when a head-on collision seems inevitable? Do you KNOW what to do or will you do the first thing that comes to mind in that moment of panic?

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