

ASTROPHYSICS

Sun's Ultraviolet Light Flares Cause Magnetic Storms

Dr. Hulburt Gives Latest Views on Magnetism of Earth And How it is Influenced by Radiation From Sun

A FLARE of ultraviolet light from the sun is the cause of magnetic storms which sometimes disrupt radio communication, according to Dr. Edward O. Hulburt, physicist of the U. S. Naval Research Laboratory in Washington. Dr. Hulburt described the mechanism of this effect when speaking in a radio talk given by Science Service over a nation-wide network of the Columbia Broadcasting System.

The entire earth constitutes a huge dynamo, according to this theory. The drifting of charged atoms, or ions, around the earth in the atmosphere some hundred miles above the earth's surface produces an electric current flowing in an eastward direction. This current, it is calculated, amounts to about three million amperes, and, like any flowing electric current, produces a magnetic field. Most of the earth's magnetism, about 98 per cent., comes from inside the earth, but the remaining two per cent. is the result of this current in the high atmosphere, Dr. Hulburt stated.

"A Small Affair"

"A magnetic storm," he continued, "is a small affair from some standpoints, for example, it is too small to trouble appreciably a mariner's compass. It causes, however, a tremendous wiggle in the curve which is traced continuously by the sensitive instruments of the magnetic observatory. And what perhaps is of more practical interest, the short wave wireless signals are often found to be wiped out and the short wave communication channels rendered inoperative during a magnetic storm. Magnetic storms differ from ordinary storms in that they occur at the same instant over the entire earth. They may last a few hours or several days; there may be only 10 or 20 storms during some years and as many as 50 or 100 during other years.

"It has long been known that most magnetic storms are due to an outburst of some sort from the sun, but just what the eruption is like or where it is

on the solar surface has not yet been discovered. The surface of the sun is like a burning prairie and is covered with countless flickering, blazing flames. Outbursts and upheavals of flaming gases occur continually, but no particular type of eruption has yet been identified with certainty as the cause of terrestrial storms. Again it has been the behavior of the short radio waves which has given a clue to what happens on the earth during a magnetic storm, and what happens in a storm in the high atmosphere. To make a long story short the general idea of what takes place is as follows:

"The solar outburst is a flare of ultraviolet light which usually blazes up to full intensity in a few minutes, or an hour, and dies away more or less

irregularly in a day or so. The flare is probably difficult to see because most of its light, being in the far ultraviolet part of the spectrum, is absorbed in the high atmosphere and does not penetrate through to us. The effects of the absorbed radiation are interesting. The ionization in the upper atmosphere is increased and a million amperes or so are suddenly added to the three million amperes encircling the earth. The magnetic effects of the additional current are simultaneous over the earth and constitute the magnetic storm. The solar flare heats the high atmosphere in the daytime, causing it to expand outward. Calculation showed that the ionized layer should be lifted up about 50 miles during an average storm and measurements with radio signals showed that this was so, increases in height of 30 to 70 miles being observed during magnetic storms."

Science News Letter, October 18, 1930

Of the 26,000 oil wells dug last year, 8,000 returned no oil.

Buttermilk has about the same food value as skimmed milk, nutritionists find.

MEDICINE

U. S. Oldest Medical School Celebrates Anniversary

A MERICA has been producing her own doctors for 165 years. Ten years before the Revolution, two young doctors of this city, who had had to go to Scotland for their own medical training, founded the first medical school in our country. The young doctors were John Morgan and William Shippen, Jr. Each later served for a period as Medical Director-General of the American Army. The school they founded is the University of Pennsylvania Medical School.

Last week eminent physicians from this country and abroad came to Philadelphia to celebrate the school's 165 years of progress and to confer with her directors on plans for the future.

Besides Morgan and Shippen, the first faculty included Adam Kuhn of Germantown and Benjamin Rush, one of the signers of the Declaration of In-

dependence. These men and those who followed them helped to make medical history in the United States.

The school started in a wooden building known as Surgeon's Hall. It progressed from there to some rooms in the mansion built by the State of Pennsylvania for George Washington. Now it occupies its own modern buildings where every kind of equipment for teaching and practicing medicine is at hand.

The development of the medical clinic of today was discussed at the celebration by Prof. William H. Welch, "dean of American medicine." Prof. A. V. Hill, distinguished English biophysicist, and Sir Walter M. Fletcher, who has played an important role in the organization and development of medical research in Great Britain, also spoke.

Science News Letter, October 18, 1930