

LIKEN SUN FLARES TO LIGHTNING HERE

By CHARLES A. FEDERER Jr. Special to THE NEW YORK TIMES.

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Michigan Astronomers Link
Solar Phenomena With Our
Radio Communication

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NEW HAVEN, Conn., Dec. 29—Solar flares, short-lived but tremendous outbursts of light on the sun that occur in the neighborhood of sunspots, may prove to be similar in nature to lightning in the earth's atmosphere. But such "solar lighting" may often have an extent of thousands of miles.

At the meeting of the American Astronomical Society today at Yale University, Dr. Helen W. Dodson of the MacMath-Hulbert Observatory of the University of Michigan, near Pontiac, described maps which she and Ruth Hedeman have compiled on solar flare phenomena which bring together more than 12,000 spectro-heliograms taken during 100 hours of observation on twenty-three days. A spectro-heliogram is a photograph of the sun taken in the one-colored light of such an element as hydrogen or calcium in the sun's atmosphere.

"During the past fifteen years or so, solar observers in all parts of the earth have assembled what might be called the first chapter in the study of solar flares," Dr. Dodson stated.

"During this period it has been shown that flares occur in the neighborhood of sunspots, usually in the bright areas surrounding them; that the flares last for minutes, not hours, and that they have a seeming correlation with certain upper atmosphere phenomena on the earth."

Effect on Short-Wave Radio

The occurrence of disturbances in the radio-reflecting layers of the upper atmosphere of the earth soon after a bright solar flare has been seen indicates that the flare releases tremendous ultraviolet radiation.

This energy, reaching the earth about 500 seconds later, disturbs the electrified layers which do

interested in the flares if their similarity to terrestrial lightning turns out to be more than superficial. It is known that lightning occurs in the electrified regions accompanying terrestrial storms, and sunspots have been described as vast storms on and in the sun's surface. They possess strong magnetic fields, indicating the presence of equally significant electrical fields.

The solar flares seem to have preferred areas for repeated occurrence, just as does lightning in any one storm. In fact, some long rope-like flares seem to follow, in part, channels already established by the dark filaments of prominences in the sun's atmosphere.

Electrified Channel Made

But a filament or a prominence of other shape can continue to exist in spite of the immediate proximity of a very bright flare, just as the discharge of lightning in a cloud does not alter appreciably the structure of the cloud itself. And the discharge produces an electrified channel through which other discharges follow in rapid succession.

Asked about the average duration of the flares, Dr. Dodson stated that it was probably five to thirty minutes. Considering the enormous scale of these solar "discharges," the analogy with the time duration of ordinary lightning does not seem far-fetched.

Dr. Dirk Brouwer, director of Yale University observatory, presented a determination of the distance of the sun from the earth based on 5,000 observations of occultations of stars by the moon. These observations were made during 1932-42 by some professional and many amateur astronomers and Dr Brouwer's result confirms the already accepted average distance to the sun as very nearly 93,000,000 miles.

The uncertainty in this accepted distance is of the order of 11,000 miles, either way. Had Dr. Brouwer available some 25,000 observations of occultations, his method would have had a similar accuracy, whereas his present uncertainty is about three times as great.

the radio reflecting and permit long-distance communication of short-wave radio. The Michigan astronomers' work is therefore of significance to radio-communications engineers.

Meteorologists also may be in-