ASTRONOMY—RADIO

Hydrogen Eruption on Sun Disrupts Radio on Earth

Most Violent Flare-Up of Last Two Years Coincided With Paralysis of Communication on July 4 and 5

A BRILLIANT eruption of hydrogen gas from a group of spots near the center of the sun's disk was revealed for the first time on July 9 upon examination of a roll of motion picture film taken of the atmosphere of the sun at the 65-foot sun-tower telescope of the Mount Wilson Observatory. The eruption began to develop about 7:10 a.m., PST on July 3 and attained maximum brightness about 8:30 a.m., after which it slowly declined. The eruption, which was the most violent recorded during the last two years, was not found sooner owing to the fact that the motion pictures are taken automatically and the reel developed and examined after each 100 feet of film has been exposed.

It was established five years ago, when the effect first began to be intensively studied at the instigation of Dr. J. H. Dellinger, radio chief of the National Bureau of Standards, that such brilliant outbursts are the direct cause of sudden fadeouts in short wave wireless signals which have paralyzed communication over the entire daylight side of the earth. The severe disturbance in communications on July 4 and 5 are typical of effects attributed to sunspot activity.

It is believed that the visible radiation from the bright outburst, although spectacular to behold, is of no effect on radio signals. The fadeouts are caused by invisible ultraviolet radiation from the eruption which suddenly produces intense ionization in a layer of the earth's atmosphere at a height of about 60 miles. This layer now absorbs the radio waves instead of allowing them to be reflected on to the receiving station.

Owing to the approach of the minimum of the sunspot cycle expected about 1944, sunspot activity and the accompanying bright eruptions have been growing much scarcer lately.

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FOR CYCLOTRON

The steel for the giant cyclotron magnet for the University of California is now about 65 per cent in place. Progress can be seen in this photograph. The final disks for the pole face are not yet in place. The one on which the two physicists are sitting is actually two half disks, a faint line betraying the split. It would be very expensive to procure and handle whole disks of this size. Each half disk weighs about eleven tons. In the foreground, one of the supervisors is inserting thin steel shims to fill up what cracks there are between the lower construction formed of 2-inch plates and the first half disk. On the front cover is a view of the whole construction.

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Bureau of Standards Radio Records Show Effect

WITHIN five minutes of the time that a hydrogen eruption on the sun was recorded at the Mt. Wilson Observatory in California, a definite fadeout of radio signals received in Washington from Toronto was recorded at the National Bureau of Standards.

Though such records are ordinarily studied only monthly, T. R. Gilliland, of the Bureau's Radio Section examined them for July 3, date of the eruption, at the request of Science Service. He found that, within five minutes after the eruption began on the Mt. Wilson film, the intensity of the Toronto signal dropped nearly to zero for about five minutes. Then it recovered, but later in the morning it dropped again, and remained down for about two hours.

Mr. Gilliland said that storms in the ionosphere, such as caused the second fadeout, are often associated with the sudden fadeouts due to the hydrogen eruptions. There was also an effect in the measurements made every half hour of the echo of signals sent up to the ionosphere, which is the reflecting layer for radio waves. At 10:00 a.m. EST (7:00 a.m., PST) ten minutes before the beginning of the Mt. Wilson record, the echo from the ionosphere was weak, and at 10:30 it was very weak. Perhaps it had fallen off completely in the interval. By 11:30 and 12:00 it was out entirely.

He reported that on July 9, nearly a week later, there was still some disturbance in the reception of these radio signals.

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A new soft white *fluorescent lamp* has been produced for lighting restaurants and shops where standard white fluorescent lamps distort some food colors strangely.