

# Solar Upheavals Heard on Earth

**R**ADIO ASTRONOMERS have concluded that the whole solar system including the earth was heavily bombarded by electrical particles when the sun spewed out unusually large flames on three occasions last year.

The events took place on Feb. 10, May 17 and Aug. 31. High-pitched radio signals from Venus and the moon received on the earth shortly after the outbursts are also believed to have been caused by electrical clouds from the solar upheavals.

These views have been recorded by the Royal Astronomical Society of Britain and also, independently, by Dr. John D. Kraus, of the Radio Observatory at Ohio State University, Columbus, Ohio, in a report to the British science journal *Nature*.

**M**R. KRAUS SAID it looked as if the stream of particles ejected by the sun and traveling earthward first encountered the planet Venus, resulting directly or indirectly in the production of strong eleven-meter radio signals from the planet that were "heard" in Ohio and elsewhere.

The particles, he added, eventually reached the earth and formed a large ionized (electrified) cloud around the moon. Dr. Kraus is not prepared to say whether the moon-signals originated on the moon or were merely a reflection of sun signals that bounced earthward from big particle clouds near the moon that acted as a mirror. But he considered the disturbances the most important of the year.

British observers have expressed surprise that cosmic rays from the sun detected on earth on the day of the biggest outburst (Feb. 10) seemed to be delayed in transit.

Cosmic rays normally travel with a velocity only slightly less than that of light: 186,000 miles a second. On this reckoning the journey from sun to earth should have taken only about eight minutes. It took eleven minutes.

The suggestion that the rays received on earth were reflections of those that first hit Mars has not been generally accepted. The view is that most cosmic ray activity after a solar outburst occurs after the flare or flames have sunk back to the surface of the sun.