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BOOKS

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CAMPS

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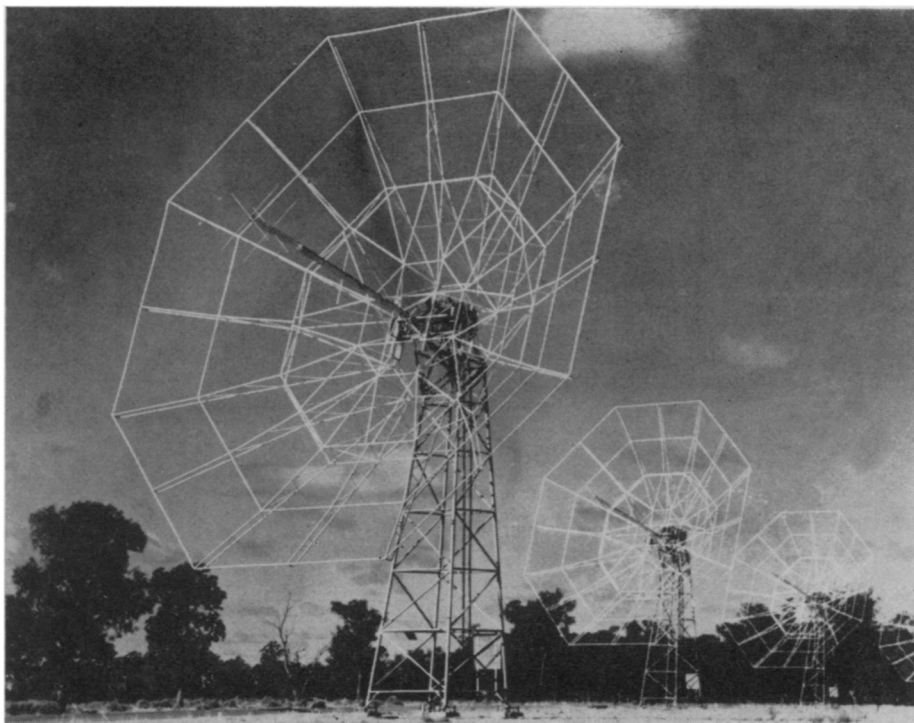
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SOLAR ASTRONOMY



Part of the two-mile-across ring of aerials in Australian radio heliograph.

Scopes for Solar Study

At Culgoora in the hot Australian inland 350 miles from Sydney, scientists have been working on a project that involves taking the first radio moving pictures of the sun.

Two new instruments designed and built in Australia, a radio heliograph and a cinemagnetograph, will produce these pictures and allow solar astronomers to watch the weather on the sun from minute to minute.

The instruments have been designed solely for this purpose and may help to unravel one of the most important unsolved solar problems—the mystery of the gigantic explosions sporadically occurring in the sun's atmosphere.

The radio heliograph, a huge ring of aerials two miles in diameter, will allow scientists to make detailed observations of the radio noise emitted in the sun's atmosphere during a storm.

The cinemagnetograph, a 12-inch telescope mounted 50 feet above the ground and subject to full thermal control, will observe the changing magnetic fields on the sun's surface.

Scientists are interested in the sun for many reasons, one being the dominating influence which the sun has on earth and the space surrounding it. It is also the most available star.

The outstanding example of a solar disturbance showing notable effects on earth is a flare. Optically, a flare is seen in monochromatic light as a transient brightening of a restricted area on the

solar disk, but the associated effects are much more dramatic.

The energy released in a large flare is millions of times greater than the highest from hydrogen bombs. The nature of the explosion is unknown, but most scientists believe there is a sudden breakdown of magnetic fields above sunspots that allows the flare's intense energy to break into space.

The radio heliograph is a huge ring of aerials nearly two miles in diameter. There are 96 parabolic or dish-type aerials, each 45 feet across, and equally spaced on a circle six miles in circumference. The aerials will operate at a frequency of 80 megacycles, automatically following the sun for four hours each day.

The instrument's inventor is Dr. Paul Wild, leader of the group studying the sun in Australia's Commonwealth Scientific and Industrial Research Organization's division of radiophysics.

Near the center of the radio heliograph CSIRO's division of physics has set up a 12-inch optical telescope that can produce a television-type picture of the sun's surface every 15 seconds.

In photographing the fine structure of flares, the new solar telescope is expected to distinguish details as small as 250 miles in diameter on the surface of the sun, which is 93 million miles from the earth. Its development was supported by the U.S. National Aeronautics and Space Administration.