City observatory equipment geared to earth-sun studies

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Geophysical observations in the Manila Observatory are geared to the study of the relationship of the earth with the sun.

THIRD OF A SERIES

Although the sun was first studied as early as 1611 when Galileo invented the telescope, its study received its biggest boost only about 60 years ago when George Ellery Hale of the Mount Wilson Observatory invented different instruments which are now standard equipment of modern observatories.

One of these is the spectroheliograph. One of the newest and most advanced models of this instrument is the heart of the solar physics laboratory of the Manila Observatory.

Leo Goldberg, an astronomer of the Harvard College Observatory, in one of the Voice of American forum lectures on science, sums up the progress of solar physics as follows:

"Before 1940, observation of the sun was a major activity at only a handful of observatories throughout the world. Solar physics has since been expanding at an almost explosive rate. Although exact figures are hard to come by, it is probably no exaggeration to say that about 100 new optical instruments, initiated what was then a new era in solar physics, and laid the groundwork for modern investigations into the physical nature of the Sun.

The investigation of the sun was no less important in 1904 than it is today, and indeed the reasons given by Hale for the establishment of the Mount Wilson Observatory are the same ones that would be considered important by astronomers in 1961. As Hale put it in his first report as director, the purpose of a solar observatory is "the investigation of the sun as a typical star, in connection with the study of stellar evolution; and as the central body of the solar system, with special reference to possible changes in the intensity of its heat radiation, such as might influence the conditions of life upon the earth."

GALAXIES

We know that the sun is just one of the stars in a grouping of heavenly bodies called a galaxy. On a bright night, one could see across the sky a luminous band which we now call the Milky Way. According to the ancient astronomers, this luminous band looked like a stream of milk coming from a heavenly cow and that is where the name galaxy was derived. Our galaxy, the Milky Way, is one of about a billion to 10 billion galaxies in the universe.

But for the present, we are just concerned with what happens in our galaxy in so far as it affects our sun and consequently the earth.

It is now known that stars, including our sun, are huge balls of very hot hydrogen gases. It is so hot the hydrogen atoms get excited and bump into each other. This happens at a temperature of about a million degrees (water boils at 100 degrees centigrade) that the hydrogen atoms

study of the magnetism of the earth (magnetometers).

In addition, the Observatory also collects information on galactic sound. Some stars in our galaxy continuously emit radio signals. As these signals pass through the radiation belt in the earth's ionosphere, some of it is absorbed.

An instrument called a Riometer picks up these radio signals from other stars and any changes in the level of these signals or galactic sound indicates the presence of high-altitude electricity around the earth.

The Observatory has also two sets of seismic instruments — one in Baguio City at the old Observatory site at Mt. Mirador and on the present Observatory site at Loyola Heights.

SOLAR COVERAGE

The Observatory is a volunteer member of the Seismic Sea Wave Warning System of the Pacific. It promptly reports the existence of any strong tremor in the Pacific recorded in its instruments to the warning center at the Honolulu Observatory.

But by far the biggest contribution to international science of the Observatory is the filling of a gap in the data of world solar coverage.

Most of the solar observatories are in the western hemisphere and, until the establishment of the Manila Observatory, data about the sun were unfilled when it is night in the observatories of the United States in Europe.

Now, the Manila Observatory supplies AGIWARN with vital information about the sun gathered during the long hours of Manila sunlight when darkness covers the US and Europe.

And what is this data that the Observatory gathers?

Well the heliograph focuses sets th. sun all day. A millimeter is 1/100 of a meter.

In other words, the light gathered by the heligraph is diffracted into 120,000 beams and a certain beam is selected to record the image of the sun.

This is done by letting the image of the sun pass o[illegible] the selected aperture.

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