



**SOUNDS IN SPACE** — Rev. Francis Glover, S.J., radio physicist of the Manila Observatory examines the readings on the riometer, an instrument that records the characteristics of radio waves emitted by other stars in our galaxy. This galactic sounds reveal the presence and the density of electrical currents in the ionosphere.

# Sun conditions affect radio communications

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For a long time scientists have known that weather conditions on the earth are affected by weather conditions of the sun. So that with the use of special instruments, solar physicists keep the sun under constant watch and note down all the activity on its surface.

This is one of the objects of the Manila Observatory. The Observatory is a member of a chain of world-wide research centers accumulating data that would re-

file of the electron density over the observation stations could be determined.

The Manila Observatory is one of some 150 observation points scattered around

times brilliant flares explode on the sun and radio signals fade out abruptly. How is it possible for an event 93 million miles away to make itself felt instantly in the terrestrial atmosphere? The source of the disturbance must propagate with the speed of light and be capable of ionizing the oxygen and nitrogen molecules of the atmosphere."

Most of our knowledge about the ionosphere were acquired during the intensive researches conducted during the IGY. Now we know that it is a region in the atmosphere where there are many free electrons and ions. These electrons and ions act as a radio mirror and reflects radio waves making possible long range radio communications.

And since this portion of the atmosphere is affected by activity in the sun, it is also being studied in conjunction with the surface of the sun itself.

One of the instruments used in this research is the ionosonde. The instrument is a modification of radar. It sends out weak radio waves to the ionosphere which are totally reflected or bounced back to earth by the electrons of the ionosphere.

By sending out radio waves at different frequencies and measuring the waves reflected back to the instrument, a pro-

In the process some of the light is absorbed. And this is one of the reasons why we do not burn to death because much of the energy of sunlight is dissipated in our atmosphere, particularly in its section called the ionosphere, before it reaches the earth.

Shapley has summarized some of the problems of the ionosphere that are of interest to scientists. According Shapley among the more important questions bothering them are:

"Which atoms are ionized to form each of the layers (of the ionosphere)?"

"What wavelengths of solar radiation are responsible for the ionization?"

"What are the details of the recombination of ions and electrons?"

"What is the role of the dynamic forces of the ionosphere?"

"Is there an ionospheric meteorology with large clouds of electrons circulating slowly in the ionosphere?"

"How do ionospheric storms arise and why is their development different at different times and places?"

"What is the role of cosmic ray particles in forming ionization?"

These are some of the questions that the Manila Observatory is helping to answer. And they do these by helping in the observation of the ionosphere.