RADIO-ASTRONOMY

Larger Radio Telescopes

Largest radio telescope in the world, being built in England, and other instruments to study "hissing" stars discussed at international radio meeting.

➤ THE MYSTERY of "radio stars" may be solved with the help of enormous new radio telescopes under construction or recently built.

These new telescopes were discussed at the General Assembly of the Union Radio-Scientifique Internationale meeting in Sydney, Australia. Designed especially to pick up the cosmic hisses that come to us from the sun and stars in the microwave region of radio waves, these radio telescopes are teaching us much about the universe.

The world's largest radio telescope, a basket-shaped affair 250 feet across, is being built for Manchester University, England, at Jodrell Bank, Cheshire. The platform on which the telescope will rotate will be 310 feet across. The instrument will be 185 feet high from its base to the top of the horizontal axis, and the entire telescope will weigh 1,270 tons.

A radio telescope 220 feet in diameter has been in use at Jodrell Bank for several years, but it is fixed in position and thus cannot reach all regions of the sky. The one under construction can be directed at any part of the sky or follow the course of any star.

The most versatile telescope in use today is the 50-foot instrument atop one of the Naval Research Laboratory buildings in Washington, D. C. The reflector of this instrument, which can scan the entire sky, consists of 30 pie-shaped sections, all of solid aluminum, machined to a tolerance of better than 1/32 of an inch.

It is the uniform smoothness of the aluminum surface that makes the instrument capable of pinpointing the source of stellar hisses down to a few minutes of arc, the highest accuracy obtained to date with a single beam. Radio signals from a fraction of an inch in wave length up to several feet, much shorter than those studied by most other instruments, are trapped by this telescope.

A radio telescope being built on Maui Island, T. H., was perhaps more discussed than any other by radio astronomers gathered at the Sydney meeting. A number of URSI members stopped by Hawaii on their way to Australia to get a look at the big instrument Grote Reber, formerly with the U. S. National Bureau of Standards, is installing. Because of its location near the ocean, it can be used to study interference of patterns from the combination of direct radiation and that reflected from the sea.

Dish-shaped telescopes such as these are not the only design, however, that is proving of value as a radio telescope. At Ohio State University, for instance, a collection of spirally wound antennas, which when completed will be 160 feet long and only 12 feet across, is already proving its worth.

Another type in use at Cornell University consists of a big rectangular array of a dipole antenna and parallel rods used as reflectors.

New and old, radical and conventional designs for radio telescopes were constantly being discussed at the URSI meeting. Lack of money is the chief difficulty standing in the way of putting some of these ideas into effect, for large radio telescopes cost up to a million dollars or so each.

Some radio astronomers can only dream of bigger and better telescopes while they push their simple instruments to the utmost. Yet some of the most outstanding advances in radio astronomy today are being made on small instruments.

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GEOGRAPHY

Better Land Use to Feed 4 Billion in 2000

➤ A WORLD population of four billion in the year 2000 will probably have enough to eat, but this will be mostly because of better use of lands now under cultivation.

This is the opinion of Dr. George B. Cressey of Syracuse University, N. Y., president of the International Geographical Union, given in an address before the 17th International Geographical Congress in Washington.

Dr. Cressey said that it is doubtful whether much food can soon come economically from new land. In Australia, Canada, the United States and Soviet Russia, the farming area has about reached its limits.

"If the Amazon and Congo or the arctic have crop potentials of large extent," he said, "their exploitation lies well in the future. Meanwhile erosion and soil exhaustion result in the abandonment of impressive acreages."

It is quite probable, Dr. Cressey declared, that we may already have passed the peak of total cultivated areas. This need not mean diminished food, for we may secure greater yields through more intensive development of our better land.

"The point is this:" he said, "if more food is needed, and that is obvious, geography cannot offer new land of much value. The good earth is essentially all in use, and the major map boundaries of cultivated land have become stabilized."

Dr. Cressey reported various estimates of how large a population could ultimately be supported by the earth. The largest estimate was 13.5 billion, with the United States having about 800,000,000.

He urged geographers to complete the presently inadequate inventory of land capabilities. Before anyone can predict the potential extent of arable land, or of food supply, or of world population, he pointed out, we must greatly extend our fundamental knowledge of the land itself.

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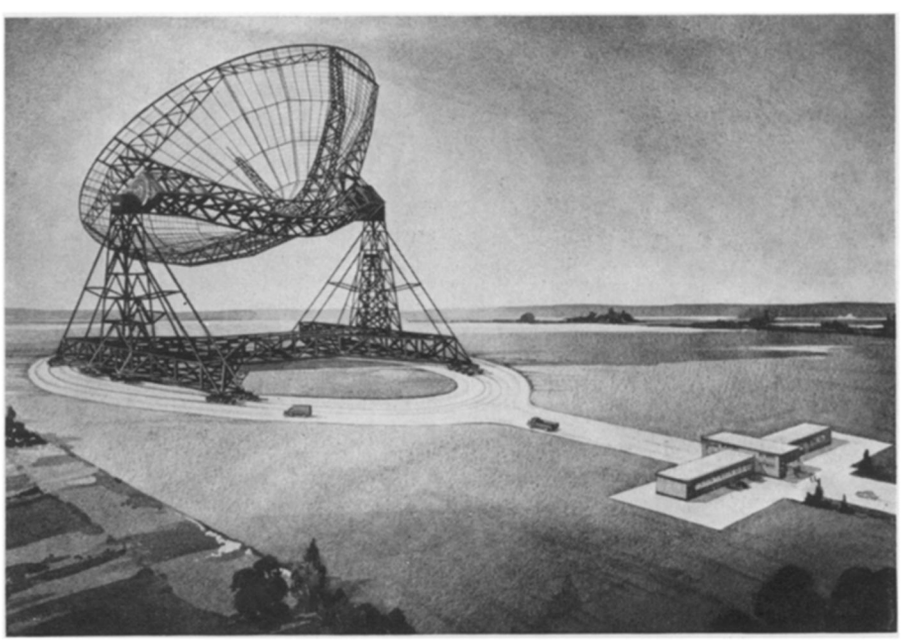

UNIVERSE EXPLORER—A steerable radio telescope, the world's largest, being built in England for Manchester University, is shown in this drawing. The rotating instrument will search out sources of cosmic "hisses" in the microwave region.