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Radio Beams From Milky Way May Prove Aid to Navigation

By Thomas R. Henry
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Approximately a dozen hot spots in the Milky Way, which constantly are sending radio broadcasts in the direction of the earth, and the nature of which is completely unknown, were reported to the American Physical Society meeting here yesterday.

They are vast regions of space where temperatures of at least 1 million degrees centigrade must exist.

Their locations are so precise that they may constitute daytime stars for the guidance of mariners.

All found to date are in the northern heavens. Doubtless there are as many in the southern skies, which have been little explored.

Investigations to date have been centered in England, Australia, and at the Bureau of Standards station at Sterling, Va., Dr. Grote Reber of the Bureau of Standards staff told the physicists.

Located in Crab Nebula.

Most precisely located of these hot spots is in the so-called Crab nebula in the constellation of Taurus the Bull. There in 1054 A.D. took place one of the major events in the history of the billion-star system of which the earth and sun are infinitesimal parts.

It was a super-novae, presumably an exploding star which in a few days increased in radiance thousands of times. The event fortunately was recorded by Chinese astronomers and is one of the two or three such events observed during the time of mankind, so far as the Milky Way galaxy is concerned. Within the past few years, however, it has been possible to observe many each year in other galaxies of comparable size, separated from this great conglomeration of stars by voids of emptiness across which light, moving at about 183,000 miles a second, moves in about a million years.

The Crab nebula is believed to be the remains of this great stellar explosion. In this part of the heavens, however, there is no observable object to which the radio waves can be traced, Dr. Reber said.

The location of this rather precise point in the constellation of Taurus is due to the recent work of two Australian physicists, who used the sea as a mirror of the incoming radiation and observed the rising and setting of the constellation.

The center of the Milky Way system is in the general direction of the constellation of Sagittarius, the Archer, in the Northern skies. In this direction from the earth—itself located on a spiral arm of the whirling galaxy, stars grow thicker and thicker. But the center is hidden from observation by a thick black curtain of cosmic dust.

Around this center British physicists, working with one band of radio wavelengths, located three of the hot spots, and Dr. Reber and his associates, using quite a different band, located another. There are still others, reported by various workers in recent months, in the constellations of Cygnus the Swan, Casseopia, Aquillus and Perseus. Work with other wavelengths is expected to reveal many more which, as apparatus is improved, can be located with more and more precision.

New Science Develops.

The observations are giving birth to a new field of science, radio astronomy. From this may be developed radio navigation, the possibility of locating a spot anywhere on earth by these hot spots which shine with invisible radiation night and day and through fog and mist. This will be of importance especially in polar navigation, where the megnetic compass is nearly useless and artificial radio aides are non-existent.

If radio waves were visible light waves, Dr. Reber explained, these spots would be glaring points of light in the heavens at all hours.

Of much greater significance to science, however, is the light the studies eventually may shed on the structure of the universe. It already is clear that the hot spots cannot be stars or aggregations of stars, Dr. Reber explained. The heat necessary to generate the type of radio waves received is far greater than that of any star.

Exceeds Space Temperature.

It is a thousand-fold higher than the postulated temperature of the heat of the space between the stars, which is approximately 10,000 degrees centigrade. This is a concept difficult to grasp since it has generally been assumed in the past that the temperature of space was close to absolute zero. Actually that is what it would feel like to a human being turned loose there. The 10,000-degree estimate is based on the probable speed of moving molecules under the radiation to which they are subjected.

The present program in the three countries concerned is to perfect apparatus so that the hot spots can be located more precisely and more of them discovered.