RADIO ASTRONOMY

Radio Waves From Mars

Scientists at Naval Research Laboratory pick up radio signals from Mars just after its close approach in early September. The planet is the third heard broadcasting radio waves.

➤ RADIO WAVES from the planet Mars have been detected for the first time by a team of scientists at the Naval Research Laboratory, Washington.

Based on 50 recordings of these waves made during two clear nights just after Mars had made its close approach of 35,120,000 miles in early September, they calculate the red planet's temperature as a whole averages just below the freezing point of water, which is 32 degrees Fahrenheit.

This is about the temperature expected from optical measurements.

The observations were made at a wavelength of three centimeters (about an inch and a quarter) with the 50-foot NRL saucer-shaped antenna, a giant receiver for radio waves from space. They were obtained by the same team of scientists, Cornell H. Mayer, Timothy P. McCullough and Russell M. Sloanaker, that first found radio waves from Venus in June. (See SNL, June 16, p. 374.)

The radio waves are caused by the planet's heat, as are those from Venus. Another class of radiation in the radio wavelengths, believed caused by thunderstorm-like activity in the atmosphere, has been detected from Venus, and also from Jupiter.

Mars is thus the third planet to be heard broadcasting radio waves.

Scientists expect also to hear from Mercury and Saturn.

The Martian radio signals are considerably weaker than those from Venus, and quite a bit of mathematical analysis was required to show that the noises recorded by the 50-foot antenna came from Mars.

The radiation emitted by Venus is sufficiently intense so that the signals picked up in the telescope's dish, when converted electronically to activate a pen recording on graph paper, could easily be recognized. Martian radiation was so much weaker that, only by taking a minimum of 25 readings, then averaging the results, could the planet's radio signals be detected.

This method cancels the random background noises also picked up by the antenna. Using 50 recordings increased the evidence of the Martian signals statistical methods showing the chances were 10,000 to one the effect was real.

Another team of scientists from NRL tried to pick up the radio waves at 1.86 centimeters, or a little less than half an inch. Their attempt was thwarted by clouds that absorbed any possible radiation. Good luck with two clear nights gave the second team their success.

Radio scientists at Ohio State University, Carnegie Institution's Department of Terrestrial Magnetism and Harvard College Observatory have also been training their antennas on Mars in the hope of picking up radio signals.

Science News Letter, September 29, 1956

METROLOGY

U. S. Length Standard Found Still Unchanged

➤ THE NATIONAL STANDARD of length, a meter bar of platinum-iridium alloy, has been checked in Paris against the international standard and found unchanged, Dr. Allen V. Astin, director of the National Bureau of Standards, has announced.

Because of the bar's great value to science and the difficulty of replacing it, Dr. Lewis V. Judson of the Bureau personally carried it to Paris for the accurate comparison of the two lengths. The national length standard has been checked only three times in 65 years.

The standard meter is defined as the distance between two parallel lines on the bar at the temperature of melting ice. Indirectly, it determines the length of a yard of cloth and allows assembling complex machine parts made by different contractors.

The value of the alloy contained in the meter bar is about $10,000, but the actual value of the meter bar is much greater. Because it is the national standard and practically irreplaceable, its true value can scarcely be estimated.

The standard meter bar is ordinarily kept locked in a vault at the Bureau, and is removed only at infrequent intervals for checking secondary standards.

The vault was recently equipped with a glass door so that visitors can be shown both the standard meter and kilogram without removing them. These two standards serve as the basis for all weights and measures in commerce, industry and science in the United States.

Besides the meter bar and kilogram, the National Bureau of Standards also has custody of about 700 other standards.

The standard kilogram's accuracy is basic to accurate determinations of the masses of nuclear particles, precise weighing of radioactive materials and determining the earth's mass.

Science News Letter, September 29, 1956

NATION'S STANDARD—Being removed from the special carrying case in which it was taken to Paris for comparison with the international standard is the U. S. national standard of length, a meter bar of platinum-iridium. Dr. Lewis V. Judson (left) personally carried the meter bar on its journey. Benjamin L. Page (right) is responsible for comparing the Bureau's working standards of length with the national standard. The meter bar was first placed in the cylindrical wooden container in front, this container was then placed in the black metal cylinder, which in turn was packed in the rectangular box.