

reach, some two billion light years into space, the universe appears to be flying apart at a rate that increases directly with distance. This apparent expansion is detected and measured by the reddening of light from far-distant galaxies, the so-called red shift.

As in the case of sound and light waves, radio waves have a higher frequency when the source is approaching and a lower frequency when it is receding. By measuring the amount of this shift, the velocity of the radio source can be found.

Research Planned

Two distinct studies of the hydrogen line have confirmed the apparent expansion of the universe at distances of 75,000,000 and 100,000,000 light years. A light year is the distance light travels in one year at 186,000 miles per second.

Since the 200-inch can see some two billion light years, scientists would be more confident they are dealing with true expansion effects and not some change in fundamental laws with distance if the correspondence of both light and radio effects could be confirmed by radio waves from sources considerably beyond those now measured.

The structure of the Milky Way, the search for unseen elements between the stars and the apparent expansion of the universe are only a few of the many problems scientists hope to resolve using the Green Bank instrument. Although smaller than its 250-foot counterpart being constructed by the British at Jodrell Bank in England, it will have an exceptionally high precision.

Congress has appropriated approximately \$4,000,000 for purchasing the land, constructing the telescope and building other necessary facilities. Associated Universities, Inc., New York, will manage activities at the installation since the National Science Foundation is forbidden by law from engaging directly in research.

Facilities for Teaching

Facilities of the national radio astronomy observatory at Green Bank will be available for research to radio astronomers from the entire country. The site was selected over 29 other locations because radio noise there is at a minimum, the high mountains acting as a shield against much of the undesirable radio noise.

The equipment at Green Bank will also be available for training graduate students in radio astronomy, the science in which astronomy and electronics are merged. Although this new science is 25 years old, its real significance as a tool for exploring the universe was not fully realized until after World War II.

The radio sky was first glimpsed in 1932 by Karl Jansky, an engineer at Bell Telephone Laboratories. In the last ten years, one discovery has followed another with bewildering speed. Larger and more sensi-

tive receivers are being constructed in many countries, including the Soviet Union, to pick up the very faint radio signals from space.

The sun, a powerful emitter of radio waves, is being extensively studied, as are the three planets so far detected by radio, Jupiter, Venus and Mars.

The second brightest radio source in the sky was found, after close cooperation between optical and radio astronomers, to be a most unusual event — two very distant galaxies in collision. The stars in each galaxy are much too far apart to smash into each other but the gas between the stars is set into violent motion by the collision. Highly turbulent gas radiates radio waves.

If the colliding galaxies were ten times more distant, they could not presently be observed even with the 200-inch Palomar telescope. As a radio object, they could, however still be detected by sensitive radio telescopes.

With the new instruments now coming into operation, scientists may thus be able to "see" far beyond the limits of visible space as they probe ever outward in their search for knowledge and understanding of the universe.

Science News Letter, May 4, 1957

BIOCHEMISTRY

Antibiotic to Protect Plant Crops Is Isolated

➤ FARMERS MAY soon have a new antibiotic to fight a variety of crop diseases. Called Duramycin, it has been found effective against several diseases afflicting beans, wheat and bluegrass.

Duramycin, named because of its ability to withstand heat, was isolated by U. S. Department of Agriculture researchers, Dr. Odette L. Shotwell of the USDA Northern Utilization Research Branch, Peoria, Ill., reported to the American Chemical Society meeting in Miami.

The antibiotic is extracted from a culture of antibiotic materials produced by a variant form of the organism *Streptomyces cinnamomeus*, the source of another antibiotic, Cinnamycin.

Co-researchers with Dr. Shotwell were Dr. Frank H. Stodola and Robert G. Dworschack, chemists, and Lloyd A. Lindenfesler and Dr. Thomas G. Pridham, bacteriologists, all of the Northern Utilization Research Branch, and William R. Michael of St. Louis University, St. Louis, Mo.

Science News Letter, May 4, 1957

RADIO

Saturday, May 11, 1957, 1:45-2:00 p.m., EDT.

"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio Network. Check your local CBS station.

Dr. F. W. King, director of service, Medical and Scientific Department, American Cancer Society, New York City, will discuss "The Fight Against Cancer."

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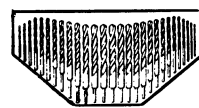
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