9-9-46

Interest & Experience via Radio.

Discovery by Jansky in 1931 20mc

Special equipment (1st slide of machine) 160mc

Describe recorder & traces like micrographic traces

assemble data (2nd slide of celestial hemispheres)

Plot along galactic equator (3rd slide of plane of galaxy)

Discuss origin not in stars but space material

Possible interstellar relation by Keenan & Heyey (5th slide)

Point out latest point in Sag. at 480mc.

No "Hockus pocus" (6th slide of Hey data)

Solar data 160mc & Southworth at 3000, 10000 & 25000mc. (8th slide)

Black body at 480mc (7th slide of Solar traces)

Mention auto noise & true solar width.

Bursts of Pawsey to be investigated.

(9th slide)

Madison Speech 9-9-46

Chicago Tribune
9-10-46

NeedBumper? Well, So Does a Space Ship

BY ROY GIBBONS
[Chicago Tribune Press Service]

Madison, Wis., Sept. 9—Bumpers to save space ships from destruction in case of collision with meteorites during trips to the moon and other planets were advocated here today at the 75th meeting of the American Astronomical society in the Memorial Union building of the University of Wisconsin.

In a paper read before approximately 100 of the nation's leading astro-physicists, Dr. Fred L. Whipple of Harvard college observatory, Cambridge, Mass., suggested two envelopes of ¼ inch steel to cushion blows passenger carrying rockets might have to take from such cosmic projectiles.

A meteorite weighing 1 milligram [about the size of a speck of dust], he reported, could be expected to penetrate a spherical space ship measuring 12 feet in diameter if the vessel were protected by only one coat of steel.

Theres' Not Much Danger

The probability is that such collisions with average sized meteorites would occur only once in 50 years, based on mathematical computations, Dr. Whipple said reassuringly. But no space ship should go aloft, he advised, unless it has at least the minimum ¼ inch protection of steel or its equivalent in a lighter metal.

Large meteorites, the size of a walnut or a man's fist that sometimes produce craters when they strike the earth, would annihilate any space ship with which they came in contact, Dr. Whipple said.

Commenting on his views, Dr. Harlow Shapley, president of the society and director of the Harvard college observatory, said the chance that human beings might be involved in such interplanetary smashups could be expected not more than once in a billion years.

Corn Fired in Rocket

In connection with the army and navy experiments with V-2 rockets and other high altitude projectiles, Dr. J. Allen Hynek, consultant on upper atmosphere research to Johns Hopkins university, Baltimore, Md., disclosed that one such projectile recently fired at White Sands, N. M., was sent aloft with a quantity of corn in its war head.

The corn, it was revealed, has been planted at Harvard university where scientists will attempt to observe any changes that may have taken place in the seed following its exposure to the sun's fierce X-radiation almost 100 miles above the earth.

In addition to work being carried out at Johns Hopkins, it was learned that other details of the high altitude rocket research program in this country are being investigated by groups of specialists in applied physics and by astronomers at Princeton university, the University of Michigan, and the naval research laboratory in Washington, D. C.

11 V-2 Flights Made

The next series of rocket flights, Dr. Hynek disclosed, are scheduled at White Sands, N. M., for the period of Oct. 10 thru Nov. 11. There have been 11 V-2 flights to date, he revealed.

In the forthcoming launchings, he explained, the scientists will specialize on cosmic rays in an attempt to arrive at the nature of those primary particles which scientists say are the source of electrical energies surpassing human comprehension.

Also to be investigated with the aid of the rockets, Dr. Hynek said, is the composition, pressure, and temperature of the upper atmos-

[Continued on page 8, column 4]

Chicago Tribune Tues 9-10-46
Pages 1 and 8

WANTS BUMPER ON SPACE SHIPS FLYING TO MOON

Harvard Expert Fears Meteorites

[Continued from first page]

phere at heights 100 and more miles above the earth.

A Record on Steel

In a flight to be directed by Johns Hopkins scientists on Oct. 24, a rocket primed to travel 100 or more miles above the earth, he said, will be equipped with a 10 sided rotating steel rod. Eight of the rod's surfaces will be coated with a sensitized film and will serve as an indestructible camera to make the first recording ever taken at that height of the sun's ultra violet spectrum.

On still another flight planned by his university for Dec. 17, the Johns Hopkins scientist said, a space missile will be fired at night to produce an artificial meteor shower. This effect will be achieved, he explained, by fitting the rocket with grenades timed to explode at specified heights. These first man-made meteor showers, he said, will be observed by a special ground camera and should lead to further information concerning the upper atmosphere.

Scientists working with the V-2 missles Dr. Hynek said, have come to the conclusion that hereafter it may be better to place their instruments in the body of the projectile rather than in the war head.

Hold 1,600 Pounds

The war heads, he explained, have room for one ton of explosives or about 1,600 pounds of scientific equipment. All war heads launched to date have been lost and with them has been destroyed the instruments they contained, he disclosed. On one rocket which the Johns Hopkins group fired to a record height of 102.5 miles July 30, the war head was severed from the projectile's body by an explosive charge which let the after part fall to earth without even blistering the paint on the missile, he said.

This freakish performance he ascribed to a shift in gravity after the rocket had lost its nose and expended all its heavy fuel in the upper air. Parachutes, he explained, have not proved successful in bringing the noses of such projectiles safely to earth. But when the nose of a rocket is blown off while it is in flight the cavity created seemed to serve as a brake on the falling missile, Dr. Hynek said.

Static from Milky Way

Grote Weber, a radio engineer of 212 W. Seminary av., Wheaton, Ill., told the gathering that investigations during the past 10 years have convinced him that radio static originates in the milky way and not in the sun.

Sounds like the hissing of a tea kettle, he said, were picked up by an electrical scanning apparatus, 32 feet in diameter, which he built to track down and measure the cosmic static.

The emanations, "so far as is known, are not of intelligent origin," he said, and do not represent, in his opinion, any effort by the inhabitants of other planets to talk to the earth.

The static, he said, seemingly generates in the cloud and dust formations in between the millions of stars making up the milk way and might be the result of collisions between electrical particles and a thin gas thrown off into the vacuum of space.

NEW YORK WORLD-TELEGRAM, MONDAY, OCTOBER 14, 1946.

Radio Signals Reported Traced to Milky Way Clouds

Origin Found In Clouds of Dust and Gas

By Science Service.

MADISON, Wis., Oct. 14.—Radio signals which have been on their way to us for hundreds and thousands of years may have originated in the clouds of gas and dust that fill much of the spaces between the stars in the Milky Way, Grote Reber of Wheaton, Ill., told the American Astronomical Society here recently.

A sheet-metal mirror 31.4 feet in diameter and 20 feet in focal length was the chief apparatus used by Mr. Reber in his radio survey of the universe. This mirror focuses the long-wave radio radiation which it collects from a scanning of the sky.

In the radio receiver the cosmic static appears as a hissing sound similar to the boiling teakettle. At 160 megacycles the sound is strong in the direction of the Milky Way. The eccentric position of the sun in the Milky Way galaxy, near the edge in the constellation of Perseus, is confirmed by the weakness of the cosmic static in that direction as compared with its greatest strength in the direction of Sagittarius, toward the center of the Milky Way.

Static Weakens Radiation.

The sun, too, gives off radio radiation, and it is easy to predict how strong it should be at our distance away from the sun. Mr. Reber stated that the observed "static" from the sun agreed well with that theoretically predicted. The other stars in the Milky Way must give off radio radiations too, but their tremendous distances weaken it so much that it is only sufficient to account for an insignificant part of the observed "cosmic static." There must be some other origin for this strong radio energy coming from the direction of the Milky Way, and Mr. Reber proposes that it originates in the depths between the multitude of stars.

Toward the center of the Milky Way, in Sagittarius, clouds of obscuring matter are very prominent, and these same interstellar clouds cause lanes and rifts to be apparent in many other regions of the Milky Way, especially in the directions of Cygnus, Cassiopeia, Canis Major and Puppis, where secondary maxima in cosmic-static intensity have been found by the Wheaton scientist. He proposes that the mechanism for producing these radio impulses is what physicists call free-free transitions of energy.

When Electron Passes Atom.

Free-free transitions result when one particle of matter, most probably an electron which has escaped from an atom, passes another atom and loses some of its energy but is not captured. The electron may pass the nucleus of a hydrogen atom, slow it down a bit or change its direction, and the energy lost will be radiated into space as a pulse of radio energy.

C O S M I C S T A T I C

by

Grote Reber

Cosmic Static is a coined name used to designate radio waves of extraterrestrial origin which arrive from space. They were discoverd about fifteen years ago by K.G. Jansky of the Bell Telephone Laboratories. The nature and characteristics of these waves have been extensively studied by the writer for the past nine years.

Quite specialized apparatus has been constructed at Wheaton, Illinois to accurately measure the intensity and direction of arrival of cosmic static. The main piece of apparatus is a sheet metal mirror 31.4 feet indiameter and 30 feet focal length. It is on a transit-telescope type of mounting. North-south position is determined by adjusting the mounting; east-west position is determined by taking advantage of the rotation of the earth with proper timing. Thus, once each day the mirror scans around a band in the sky. The results of any cosmic static intercepted is automatically recorded on a moving chart geared to the rotation of the earth.

These cosmic static radio waves are not of intelligent origin, so far as is known. They are a phenomenon of nature and appear as a hissing sound similar to the boiling of a teakettle in the earphones of the receiver. Extensive surveys at a frequency of