ASTRONOMY

Radio Impulse Found Coming From Heart of Milky Way

Year's Study of Strange Cosmic "Hiss" Indicates That Its Apparent Source Follows Rotation of Stars

TO THE COSMIC rays, the light of the stars and other detected radiations from outer space, there has now been added a mysterious Milky Way static or radio impulse that seems to come from the vicinity of the very heart of the Milky Way.

Karl G. Jansky, of Bell Telephone Laboratories, discovered this cosmic "hiss" while working with an extremely sensitive receiving set at Holmdel, N. J. Disentangling this particular kind of static from other sorts that are heard in radio sets, Mr. Jansky noted that the hiss was always a little stronger coming from one direction than from all other directions and that this direction of maximum static hiss was continually rotating around the horizon, approximately once a day.

Mr. Jansky made many observations, attempting to check the idea that the hiss had something to do with the sun's position and the earth's daily motion. He discovered that the direction of the hiss progressed slightly in position in the sky with each day. For a year he gathered observations daily, without making any scientific announcement. Apparently the hiss was not following the sun, but something that gained on the sun four minutes a day or a whole rotation of the heavens in a year. This is exactly what the stars do, as every amateur astronomer or star-gazer knows.

Received on Short-Wave

The cosmic static was therefore seemingly hitched to a given place in the heavens or the Milky Way. It is a stream of radio impulses coming from some fixed point outside the solar system in the great aggregation of stars, known as the Milky Way, in which our sun is a mere minor star.

Mr. Jansky's radio was short-wave, tuned to 14.6 meters or 20,600 kilocycles, but he feels sure that these interstellar static impulses will be found all up and down the radio spectrum, probably increasing with frequency in the high-frequency or short wave portions.

The point from which the Milky Way static comes is very near the location of the center of our Milky Way galaxy as determined by Dr. Harlow Shapley, director of Harvard College Observatory. The point is where the plane in which the earth revolves around the sun crosses the center of the Milky Way. It is also the position toward which the solar system is moving with respect to the stars. The astronomical coordinates of the newly discovered radio waves are right ascension 18 hours and a declination of about minus or south 20 degrees. If you want to see where this is in the heavens, look at the Milky Way between the constellations of Sagittarius and Ophiuchus.

What generates the cosmic hiss is as yet unknown, just as the origin of the cosmic rays is unknown after many years of research. The center of the Milky Way is computed to be some 40,000 light years from the solar system and the power of a generating station, measured in earthly terms, would be prodigious, perhaps millions upon millions of times as powerful as any broadcasting station on earth.

Perhaps the cosmic hiss is the by-product of some wide-spread galactic happening, such as transmutation of mass into light, a mighty murmur of atoms disturbed. Mystics may see in the Milky Way static messages from intelligent beings on unseen planets of remote stars, but scientists will not support this view. There has been presented another problem for the future of science to solve.

Science News Letter, June 3, 1933

BOTANY

New Giant Clover Species Found in Northwest

WITH SEVEN leaflets to each leaf instead of the usual three, and big in all its parts, a new giant clover species has been discovered in the state of Washington by J. W. Thompson of Seattle. It was growing on dry sagebrush slopes near the mouth of Swakane Creek, Chelan County, Wash.

Mr. Thompson sent a specimen to the U. S. National Herbarium, Washington, D. C., where it was examined by C. V. Morton. Mr. Morton found it to be a plant hitherto entirely unknown, and therefore gave it a technical description in the *Journal of the Washington Academy of Sciences*. He named it *Trifolium thompsoni,* in honor of its discoverer.

Science News Letter, June 3, 1933

PSYCHOLOGY

Apes Work for "Money" and Spend It in Slot Machines

APES CAN be taught how to use "money" to buy the food delicacies they enjoy, to choose a small white token rather than a larger one with less purchasing power, and even to "hoard" more of the tokens than they can spend at one time and to discard worthless brass checks. They will work just about as hard to earn the "money" as they will for a direct reward of food.

This ability of animals lower in the scale than man to realize the significance of symbols was revealed in Washington when Dr. John B. Wolfe, National Research Council Fellow, reported to the Division of Anthropology and Psychology of the Council experiments he had been making, under the direction of Dr. Robert M. Yerkes, with chimpanzees in the Laboratories of Comparative Psychobiology at Yale.

Poker chips of various sizes and colors were used by Dr. Wolfe as money and he taught the apes to spend these by placing them in a slot machine aptly called the "chimpomat."

This was a difficult task at first. The chimpanzees readily learned to reach for the food at the opening even before the token was placed in the slot. But it was harder to teach them to put the tokens in the slots themselves.

When two animals had learned the

trick, however, Dr. Wolfe allowed the other two to learn from the experienced apes, and they picked it up much more easily.

The chimpanzees will also use the chips and slot machines for other purposes than to secure food, it was found. A yellow chip placed in the proper machine buys the opportunity to play with the experimenter, and a blue chip properly spent entitles the ape to leave the experimental room and go back to its living quarters. The use of the blue chip was learned with greater ease than any of the others, Dr. Wolfe said, and it was selected in preference to all the others by one animal who was anxious to get away from a disliked camera man.

The apes will not play the machines just for the entertainment of seeing them work, however. A brass check which can be inserted in the machines but buys no reward is discarded by the animals as soon as they learn that it is a "plug nickel."

Science News Letter, June 3, 1933

GEOLOGY

New Mineral Shines Like Raven's Wing

CORVUSITE, or ravenstone, is the name which has been given to a newly-discovered mineral from Utah, which has the iridescent luster of a raven's wing. Its scientific name is in reference to the Latin word for a raven or crow, *corvus*. The mineral was investigated by Edward P. Henderson and Frank L. Hess of the Smithsonian staff.

The new mineral contains a high percentage of the rare metal vanadium. It was found in close proximity to the carnotite deposits which constitute the chief source of radium in the United States. Intimately associated with the corvusite deposits are the petrified remains of ancient trees, but what connection these may have had with its formation is not known as yet.

A second newly discovered mineral reported by the Smithsonian Institution scientists is a black, pitchy substance which, however, has a true crystalline structure. It is rich in the now widely used metallic element chromium, and is found on the bark of petrified trees.

The first specimens were called to the attention of geologists by J. L. Riland, a veteran newspaperman of Meeker, Colo., and the mineral has been named rilandite in his honor.

Science News Letter, June 3, 1933

MEDICINE

Medical Research Conquering Diseases of Past Middle Life

Advances in Physiology Are Overcoming Chronic Ills Made Ravaging by Life-Extending Success of Bacteriology

A BRIGHT hope has awakened in the hearts of informed physicians and laboratory investigators that the next years will witness a great acceleration in the control of the chronic diseases of past middle life, those ills which now take increasing tolls due to the life-extending success of bacteriology in controlling the infectious diseases of early life and the dangers of surgery.

That eminent leader in medical research, Dr. Simon Flexner, Director of the Rockefeller Institute for Medical Research, analyzes the present status of the triumphs of experimental medicine in a communication to the current *Scientific Monthly*.

Pasteur, Lister and Koch provided the scientific foundation for present day bacteriologly and operative surgery. They ushered in the era of experimental study of such diseases as tuberculosis, typhoid fever, diphtheria and epidemic meningitis.

Bacteriology and aseptic surgery have written their triumphs into the tables of mortality among infants, children, and adolescents, Dr. Flexner observes, and "in a period of time not too long deferred have led to an increase in the individual expectation of life in the culturally advanced countries of at least twelve years."

Now the science of physiology has had its foundations laid, precisely as the science of bacteriology had to be developed in the earlier years. Dr. Flexner tells us that marked progress in the control of disease has been resumed along this new line. Physiologists have disclosed the functions of the ductless glands of the body. These glands are essential to the maintenance of health and their derangement is responsible for serious and fatal diseases as age advances. It is because of the discoveries regarding the nature of the thyroid, adrenal and pituitary glands and of certain secondary but similar essential activities of other organs such as the pancreas and liver, Dr. Flexner tells us, that increased control is being achieved of certain diseases of past middle life, among which diabetes and pernicious anemia may be singled out for mention. Considerable progress has been made but Dr. Flexner predicts still greater achievements will be made if the growth of science continues unimpeded.

While there is just cause for rejoicing at the achievements, Dr. Flexner warns that there are hard problems immediately ahead to which answers, at least sufficient answers, have not yet been obtained. Cancer, Bright's disease, and diseases of the heart and blood vessels are seriously prevalent and destructive. There is no lack of effort being made to reach a fuller understanding of their nature, origin and control. Dr. Flexner believes that progress is being made.

"The ultimate goal seems, however, still distant," he writes. "There is but one way, I submit, to bring that goal within reasonable hope of being reached finally and that is by continued, unremitting, unobstructed study by the experimental method."

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PHYSICS—PSYCHOLOGY

Telephone Message Between Crickets

A TELEPHONE message from a male cricket to a responsive female was described by Dr. R. T. Beatty of the Admiralty Research Laboratory in a recent lecture on the sense of hearing in animals.

In nature, the male cricket rubs his wing casings together for his song, and the female hops toward him in answer to the call. Although it was known that a cricket possesses hearing apparatus in its forelegs, this experiment was devised to prove that other factors of smell, vision or vibration are not involved in the response to sounds. Accordingly the male was invited to chirp into the 'phone. When the call was made, the female cricket rose into the air and settled down beside the receiver.

Science News Letter, June 3, 1933