

Cosmic Rays May Be Like Tiny Bullets

Physics

Experiments Verifying Concept Reported To Physicists

COSMIC rays, the invisible visitors from outer space that have been interpreted by Dr. R. A. Millikan as heralds of the creation of matter out of errant energy, do not come as steady, undulating streams after the manner of the older concept of light rays, but as separate, high-velocity particles, like tiny bullets.

This concept of the nature of cosmic rays has received support from the work of Dr. L. F. Curtis of the U. S. Bureau of Standards, reported before the recent meeting of the American Physical Society.

Dr. Curtis placed two electron counters, instruments adapted for the detection of the swift passage of these almost infinitely small, electric particles, one above the other. Between the two he inserted the poles of a powerful electro-magnet. It has long been known that electrons and other electrically charged particles can be pulled from their course by a magnetic field, and Dr. Curtis reasoned that if the cosmic rays were corpuscular in their nature he should be able to deflect them after they had struck and registered in the first electron counter, and before they had made contact with the second.

This occurred. When the electro-magnet was not in operation, the two electron counters would frequently register at practically the same instant. This was taken to indicate the impact of the same particle, as it passed through the two instruments successively. This interpretation was first applied by two German workers, Walther Bothe and Werner Kolhörster, the latter one of the pioneers of cosmic ray research.

But when Dr. Curtis turned on the current in his electro-magnet, the number of simultaneous registrations by his two electron counters was materially reduced, thus constituting a demonstration of the existence of a corpuscular radiation of very high energy.

Material Affects Tone

THE greatest care of master organ builders in selecting material is not in vain. One of two pipes, exactly alike in every dimension and differing only in the kind of material of which they are made, may give a beautiful tone and the other a very harsh sound, Dr. Dayton C. Miller and John R. Martin, two physicists of the Case School of Applied Science, Cleveland, Ohio, have found.

They made three organ pipes—one of wood, another of single-walled zinc and a third of double-walled zinc. The tones of each were unlike, and further differences were caused by touching the single-shell zinc pipe and by filling the double-shell pipe with water.

Water Stops Rays

PURE water, containing no mineral salts in solution, transmits ultraviolet light fairly well. But a little dissolved mineral makes a thin layer of water much less transparent to these invisible radiations. How little, Dr. Charles D. Hodgman of the Case School of Applied Science,

Cleveland, Ohio, told the meeting. He found that a layer less than an inch thick of common lake water, taken from Lake Erie, and containing no more mineral than most city water, stops about a quarter of the longer-wave ultraviolet rays and nearly nine-tenths of the short-wave rays.

Radio and Weather

IF you get stronger radio reception from a station northwest of you it is likely to rain next day. If the reception is weaker than average, it is a sign of fair weather.

This new brand of weather wisdom was explained by Prof. R. C. Colwell of the University of West Virginia. Listening to station KDKA, Pittsburgh, night after night at his set at Morgantown, W. Va., Prof. Colwell discovered that whenever there was an area of low atmospheric pressure, presaging a storm, between the two cities, the strength of the signals was increased. When a high pressure area moved in, bringing fair weather in its train, the signal strength decreased.

Earth's Core Not Iron

PARTLY broken up and compressed molecules 2000 miles and deeper in the earth may account for this world's great weight, Dr. A. A. Bless, physicist at the University of Florida, reported.

The earth is much heavier than it would be if it were composed throughout of the materials found on its surface, and it is generally thought that this extra weight is supplied by an iron core. But Dr. Bless believes the dense material within the earth, whatever it is, would be lighter on the surface. Its molecules are ionized by the high temperatures, electrons being torn away from them, and thus the atoms are decreased in size, causing a sufficient increase in density to account for the observed mass of the earth, he explained.

Science News-Letter, May 3, 1930

The Answer Is

In This Issue

What causes *water* to stop *ultraviolet* rays? p. 274—What proportion of our *population* are in *insane* hospitals? p. 275—what *instrument* will divide *cells* without harm? p. 276—What range of *sounds* can a *fish* hear? p. 276—How does a *fever* help the *patient*? p. 280—Was *alimony* known in the Middle Ages? p. 280—Where was the *second* planet beyond *Neptune* discovered? p. 281—Where can *stars* be viewed in the *daytime*? p. 282—Where can one obtain the *advice* of Dr. Adler on *child* guidance? p. 288.

all communications to Washington, D. C. Cable address: Scienserve, Washington.

Entered as second class matter October 1, 1926, at the postoffice at Baltimore, Md., under the act of March 3, 1879. Established in mimeographed form March 13, 1922. Title registered as trade-mark, U. S. Patent Office.

Subscription rate—\$5.00 a year postpaid. 15 cents a copy. Ten or more copies to same address, 5 cents a copy. Special reduced subscription rates are available to members of the American Association for the Advancement of Science.

In requesting change of address, please give old as well as new address.

Advertising rates furnished on application.

Copyright, 1930, by Science Service, Inc. Reproduction of any portion of the SCIENCE NEWS-LETTER is strictly prohibited since it is distributed for personal, school, club or library use only. Newspapers, magazines and other publications are invited to avail themselves of the numerous syndicate services issued by Science Service, details and samples of which will gladly be sent on request.



SCIENCE NEWS-LETTER, The Weekly Summary of Current Science. Published by Science Service, Inc., the Institution for the Popularization of Science organized under the auspices of the National Academy of Sciences, the National Research Council and the American Association for the Advancement of Science.

Edited by Watson Davis.

Publication Office, 1918 Harford Ave., Baltimore, Md. Editorial and Executive Office, 21st and B Sts., N. W., Washington, D. C. Address