

PHYSICS

Cosmic Rays May Be Emitted When Magnetic Poles Combine

In New Explanation Dr. Langer Reasons How Proton, Neutron, Photon and Radioactive Phenomena Can Arise

A NEW explanation of the origin of the cosmic rays is given by Dr. R. M. Langer of the California Institute of Technology at Pasadena in a short report in the current issue of *Science*.

Dr. Langer enunciates a new theory of the fundamental particles of nature, building on the observations of Dr. Carl D. Anderson that indicate the probable existence of a positive electron (*SNL*, Sept. 24, 1932, p. 197) and using the theory of Dr. P. A. M. Dirac, British physicist, who postulates positive and negative magnetic poles as fundamental entities.

Starting with the electron and the Dirac magnetic pole as the fundamental particles, Dr. Langer reasons how the proton, neutron, photon and radioactive phenomena can arise.

Thousand-Million-Volt Energy

He pictures the neutron, the particle discovered earlier this year, as built of a positive and negative magnetic pole. Using the equations of Dr. Dirac, he finds that the two poles combined have an energy corresponding to a mass approximately that of the proton, which is also believed to be that of the neutron. In the transformation there is an energy difference of a thousand million volts and since this is of the order of the cosmic rays, Dr. Langer suggests that it is the "simplest system so far considered which could explain the emission of cosmic radiation."

To obtain a proton, Dr. Langer combines the neutron with the positive electron, of mass equal to the familiar negative electron, which was suggested by Dr. Anderson. The negative electron of the neutron is cancelled out by the positive electron, which leaves the proton.

Vanishing Mass

Dr. Langer further suggests that the photon or the sub-atomic unit of light may be formed through the combination of the two kinds of electrons, with a vanishing of mass and a velocity of light. Another possibility suggested is

that the photon may be constructed of a positive and negative electron very close together.

Dr. Langer is on the staff of the Norman Bridge Laboratory of Physics of which Dr. R. A. Millikan is director. Dr. Anderson is in the same laboratory. Dr. Langer was one of those who suggested the existence of the neutron which was experimentally discovered this year in Europe.

Science News Letter, October 8, 1932

BACTERIOLOGY

Milk Pasteurized by Conducting Electricity

YOU MAY BE drinking milk these days which has been pasteurized, not by heat from fire, but by an electric current passing through it. For apparatus which guarantees the safety of milk in this electrical manner has been installed in seventeen plants in six states and two foreign countries, and has a daily output of approximately 30,000 gallons, Prof. C. G. King of the University of Pittsburgh reported to the Electrochemical Society.

Because of its mineral salts, milk readily conducts electricity. At the same time the liquid offers enough resistance

ARCHAEOLOGY

Hippodrome Big As Football Stadium Found in Antioch

THE PEOPLE of ancient Antioch had a hippodrome big enough to take rank with famous football stadiums of today, it appears from a report on the latest discoveries by archaeologists excavating the ruins of Antioch. Prof. George A. Elderkin of Princeton, leader of the joint expedition to Antioch, has prepared the report.

Antioch's hippodrome had a capacity

of 80,000 persons, it is announced. From this, it would compare in size with the Rose Bowl at Pasadena and the Yale University Bowl.

The expedition, which is spending five years excavating Antioch, is a joint project of the Baltimore Museum of Art, the Musée Nationaux of Paris, the Worcester Art Museum, and Princeton University.

to the passage of current to cause the electricity to give up heat to the milk. "The possibility of an electrical or electrochemical effect upon bacteria in addition to the heat effect has been considered," Dr. King said, "but at present there is no clear evidence from which the question can be answered. Uniform heating accounts for the major effect, however, and it therefore seems preferable to consider tentatively the entire bacterial effect due to heating."

Tests by state health officials for organisms responsible for disease were said to have proved the efficiency of the process.

Science News Letter, October 8, 1932

PHOTOGRAPHY

Plates For Star Pictures Should Be Kept on Ice

LIKE EGGS and sausage, photographic plates should be kept in the refrigerator if their quality is to be preserved at its best. This recommendation is made by Dr. C. E. K. Mees, director of the Eastman Kodak Company's research laboratory at Rochester, in regard to plates intended for astronomical purposes.

Several large observatories, he says, have already adopted the practice of keeping their unexposed plates on ice. The lower the temperature, the more slowly do changes in the emulsion take place. The result is that those placed in the refrigerator as soon as possible, and kept there until used, are more uniform in their performance than those that have been subjected to a variety of temperatures. For ordinary photography, the lack of uniformity would hardly be noticeable.

Science News Letter, October 8, 1932