PHYSICS

New Trap For Cosmic Rays Catches Historic Picture

Entering With 10,000,000 Electron-Volt Energy, Ray Strikes Glass Plate and Emerges Only to Die

USING a new and novel trap for catching piercing cosmic rays, Nobel Prize winner Dr. Carl D. Anderson and his colleague, Dr. Seth Neddermeyer, have obtained a photograph which will some day be historic. It shows a powerful cosmic ray particle with 10,000,000 electron-volt energy entering the apparatus and emerging with an energy of only 210,000 electron-volts. But, most unusual, the particle actually came to rest within the range of the camera and its stopping is recorded.

Measurements indicate the particle is the so-called heavy electron with a mass some 240 times as great as that of the ordinary electron, basic unit of electricity.

Although the photograph does not actually show it, Drs. Anderson and Neddermeyer suggest (*Physical Review*, July 1) that the heavy electron came to rest and then disintegrated into a positive electron with ordinary mass.

The new cosmic ray trap, developed at the California Institute of Technology, consists of a special form of a device known as a Wilson cloud chamber in which the tracks produced by the speeding cosmic rays are made visible as they serve a nuclei of condensation of water vapor in the chamber. Through a window a photograph of these tracks can be taken.

In the usual plan electrical counters near this chamber detect the presence of a cosmic ray and set off the camera mechanism. In the new apparatus, however, these detectors, called Geiger counters, are supplemented further by still another counter inside the cloud chamber itself. This arrangement favors the probability of observing cosmic ray particles near the ends of their ranges when their energies are weak. That the device actually photographed a cosmic ray particle as it stopped and came to rest was a fortuitous happening.

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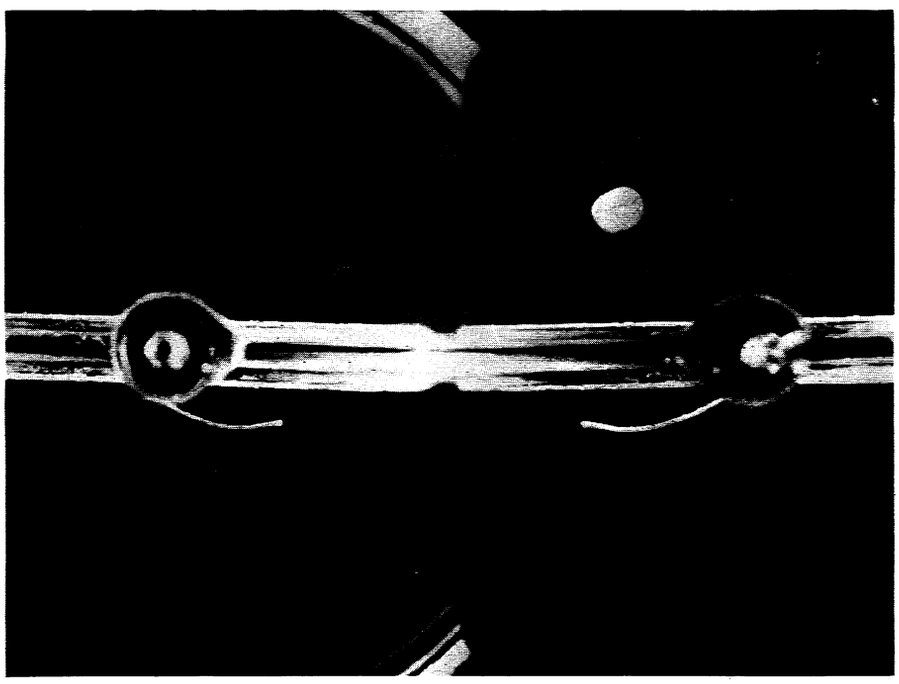

DYING COSMIC RAY

Here is the unretouched photograph of the cosmic ray particle which pierced the special Wilson Cloud Chamber apparatus of Drs. Carl D. Anderson and Seth H. Neddermeyer and then came to a full stop. The photograph is stereoscopic and, if viewed with a modern variation of Grandma's old stereoscope, shows the cosmic ray tracks standing out in three dimensions. The dotted-line track coming from the top is the track of the incoming particle carrying 10,000,000 electron-volts. After passing through the glass plate at the center of the picture, the track is much wider and curved, for the particle is nearly "dead"; its energy has dropped to only 210,000 electron-volts.

PUBLIC HEALTH

Death Rate Increases During Heat Waves

DURING a heat wave a four-fold increase in the death rate over the expected death rate may occur, although not all the excess deaths are due to sunstroke or heat prostration, Mary Gover, associate statistician of the U. S. Public Health Service, points out in *Public Health Reports*, (July 15) issued by the Service.

The heat may be certified as responsible for about one-quarter of the excess deaths, as in Kansas during July of 1934, but during a heat wave there are also more than the expected number of deaths from heart diseases, cerebral hemorrhage, kidney disease and pneumonia.

First Most Fatal

If two heat waves strike a community during one summer, there will not be nearly so many excess deaths during the second one, Miss Gover found. This may be partly due to the fact that most of the deaths among persons with chronic disease of heart and circulation were hastened during the first hot spell. It may also be due to acclimatization.

Sharp increases in mortality related to heat waves occur most frequently in July and in the states of Ohio, Indiana, Illinois, Missouri, Iowa and Nebraska. North Atlantic cities are also frequently affected. Least affected are the Pacific Coast and the far South. Miss Gover attributes the few excess deaths in the South to acclimatization.

A number of consecutive days of extreme heat have more effect on the death rate than variable temperatures.

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