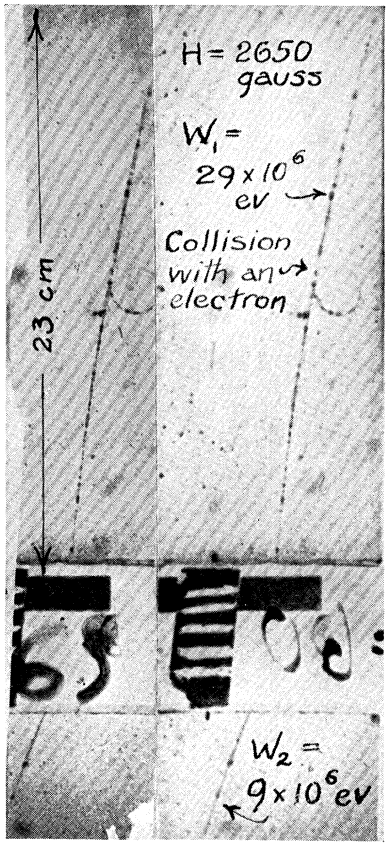

FIG. 2. Stereoscopic cloud-chamber photograph of a cosmic-ray mesotron of mass $M_0=(240\pm20)\ m_0$. The measurement of the mass was obtained from the elastic collisions with an electron of the gas in the chamber.

good accord with the value 20×10^6 ev obtained directly from our picture.

Finally, after the traversal of the box of counters, the track shows a heavier ionization; it appears more like a continuous line instead of the discrete droplets which one sees above the absorber.

[1] J. G. Wilson, Proc. Roy. Soc. London **A166**, 482 (1938); P. M. S. Blackett, *La Radiation Cosmique* (Hermann, 1935), plate X; L. Leprince-Ringuet and J. Crussard, J. de phys. et rad. **8**, 207 (1937).
[2] L. Leprince-Ringuet, S. Gorodetsky, E. Nageotte and R. Richard-Foy, Comptes rendus (Oct. 14, 1940).
[3] S. H. Neddermeyer and C. D. Anderson, Phys. Rev. **54**, 88 (1938).
[4] R. Brode, Rev. Mod. Phys. **11**, 223 (1939).

Pair Production in the Field of an Electron

KENICHI SHINOHARA AND MITIO HATOYAMA
Institute of Physical and Chemical Research, Hongo, Tokyo
January 17, 1941

F. PERRIN[1] predicted and studied from a theoretical point of view the possibility of pair production by a photon in the field of an electron. M. da Silva[2] found a triplet of two negative and one positive electrons starting from a point in a thin lead foil in a cloud chamber placed near an active deposit from Th, which he attributed to pair production by the gamma-rays from ThC″ in the field of an electron.

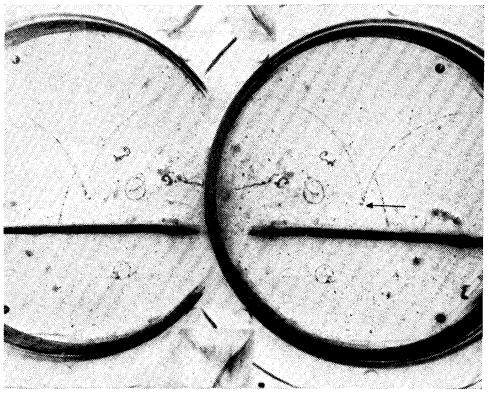

FIG. 1. A photograph of pair production in the field of an electron. Three tracks, two negative and one positive, start from a point (indicated by an arrow) in the gas filling the chamber. Another small black point is seen which resembles a track of a heavy particle, but stereoscopic examination reveals this to be a dust at the bottom of the chamber.

We obtained during the study of gamma-rays from fluorine bombarded with protons a photograph shown in Fig. 1.

Three electron tracks, two negative and one positive, start from a point in the gas filling the cloud chamber. The energies of these three electrons are: positron 2.38 Mev; electron 2.38 Mev; electron 0.17 Mev. These values give 4.93 Mev as the total kinetic energy of the three electrons, which in turn gives the value 5.95 Mev for the energy of the incoming photon, assuming that this is really another case of pair production by a photon in the field of an electron. To this value must be added a probable error of ±2 percent this value agrees within the limits of experimental error with our[3] value of 6.1 ± 0.1 Mev for the energy of gamma-rays from $F+p$ and also with the values given by Lauritsen and others.[4]

Further search for photographs of such triplets is in progress, the result of which will soon be published in a Japanese journal.

[1] F. Perrin, Comptes rendus **197**, 1100 (1933).
[2] A. Marques da Silva, Ann. de physique **11**, 504 (1939).
[3] K. Shinohara and M. Hatoyama, to be published soon.
[4] L. A. Delsasso, W. A. Fowler and C. C. Lauritsen, Phys. Rev. **51**, 527 (1937); C. C. Lauritsen, W. A. Fowler and T. Lauritsen, Phys. Rev. **56**, 858 (1939).

Soft Component and Decay of Mesotrons at 3000 Meters

NIKITIN FEDORENKO
Physico Technical Institute, Leningrad, U.S.S.R.
February 10, 1941 (By cable)

WE found the ratio of soft and hard component independent of zenith angle. We thus conclude both components to be in mutual equilibrium. This ratio increases from sea level to 3000 meters 1.33 times. Our results lead to the conclusion that electrons take only one-half of the decay energy of mesotrons. The remainder is probably given to neutrinos. Mean lifetime of mesotrons follows 2.5 microseconds.

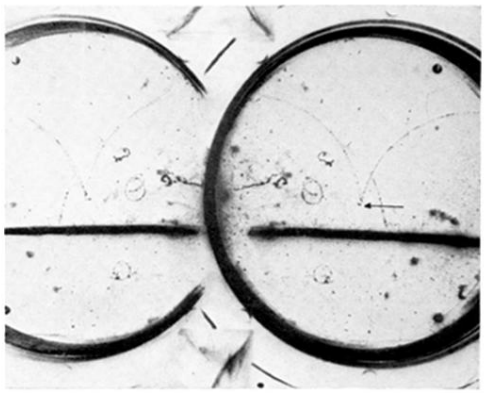

FIG. 1. A photograph of pair production in the field of an electron. Three tracks, two negative and one positive, start from a point (indicated by an arrow) in the gas filling the chamber. Another small black point is seen which resembles a track of a heavy particle, but stereoscopic examination reveals this to be a dust at the bottom of the chamber.