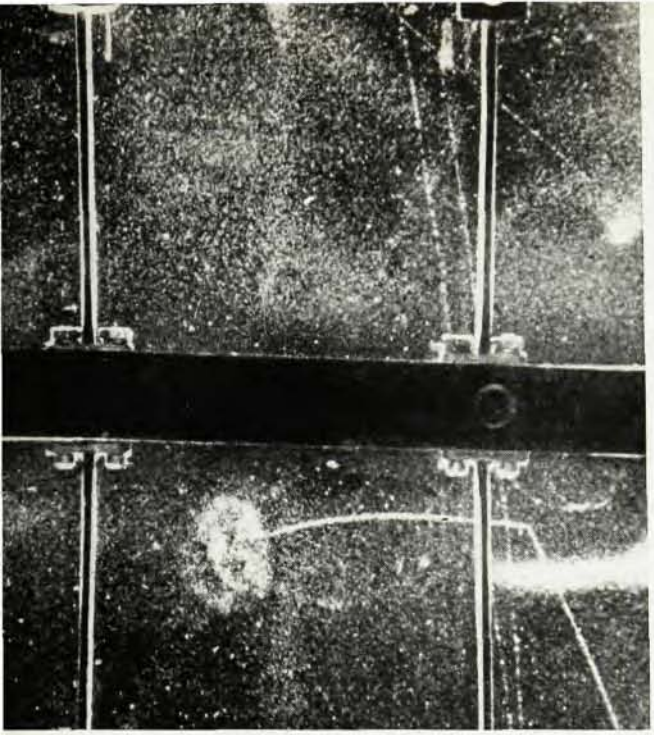
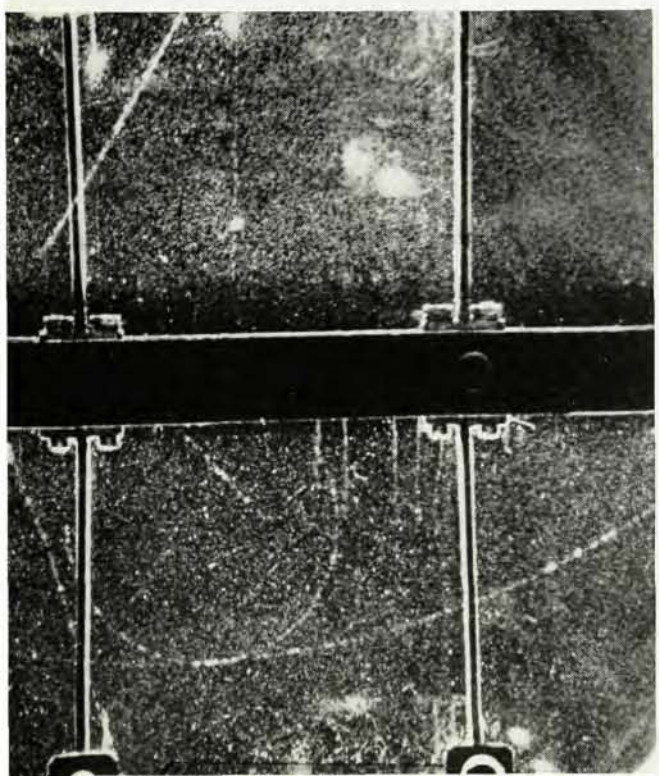


New uncharged particle, which leaves no visible track, penetrates lead plate (dark band at center of cloud chamber) and disintegrates into two charged secondary particles and possibly into neutral particles as well. Measurements of curvature and ionization of the secondary particles from track photographs such as this indicate the probable characteristics of the original particle, even though its track cannot be seen.

TWO NEW PARTICLES

New charged particle appears below lead plate at left. The track suddenly changes direction (by about 6 degrees in this case) at point of disintegration. Lower portion of track is that of a secondary charged particle. The other secondary particle or particles, being neutral, cannot leave a track to be photographed.



at an angle is that of a secondary charged particle, while another product of the disintegration must be at least one secondary neutral particle leaving no track to be seen.

Lifetime of both new particles is about three ten-billionths of a second.

THE DINEUTRON

LOS ALAMOS MAY HAVE FOUND IT

Although continuing efforts have been made, both in this country and abroad, to find convincing experimental evidence that two neutrons occasionally behave as a single particle, the search for the dineutron has been almost uniformly unrewarding. Preliminary results of a set of experiments being conducted at the Los Alamos Scientific Laboratory, however, give hope that the dineutron has in fact been observed.

In another paper given at the Washington meeting of the American Physical Society, Harold Agnew, representing a Los Alamos research group headed by Richard Taschek, described a study of the triton-triton reaction in which the Los Alamos two and one-half million volt electrostatic generator was used to accelerate tritons. The emission of alpha particles in the reaction provides the clue for detecting dineutrons, the maximum energy for the alpha particles for any given angle being obtained whenever two neutrons come off in the same direction, either as separate particles or as a dineutron. In the latter case, according to the Los Alamos workers, a group of alpha particles may be expected which should vary with angle in a predictable manner. The experiments provided some evidence for such a group.

In Great Britain, scientists at Harwell were reported late last year to have unsuccessfully attempted to find evidence for the dineutron in an experiment in which an isotope of bismuth was exposed to the neutron flux of the Harwell pile. The characteristic disintegration products that might have been expected if dineutrons were present were not observed.

METAMORPHOSIS

RADIOACTIVE DECAY OF THE NEUTRON

Letters to the Editor from Oak Ridge and Chalk River appearing in the May 1 issue of the *Physical Review* give results of recent experimental work on the instability of the neutron. A. H. Snell, F. Pleasanton, and R. V. McCord of the Oak Ridge National Laboratory reported an experiment in which neutrons from the uranium-graphite reactor at Oak Ridge were beamed through an evacuated tank and coincidence events observed with an appropriate counting arrangement. Evidence was obtained for the existence of events involving the appearance of low energy positive particles of roughly protonic mass and of others that might have been beta particles. "The observations would be explained completely and without internal contradiction," said the authors, "if neutrons in free flight transform spontaneously into protons with the emission of beta particles having a maximum energy of less than about 0.9 Mev."

The Ontario report, submitted by J. M. Robson of the Canadian Atomic Energy Project, described an arrange-

ment using neutrons from the Chalk River pile in which low energy positive particles were observed by means of a thin magnetic lens spectrometer in conjunction with an electrostatic field. The positive particles were identified by Robson as definitely being protons resulting from the radioactive decay of the neutron.

An estimate given by Robson for the half-life of the neutron placed this within limits of 9 and 25 minutes. The Oak Ridge communication stated that a half-life between 10 and 30 minutes would be consistent with the observations reported.

INTERNATIONAL CONFERENCES

HEAT TRANSMISSION

Postwar developments in heat transfer will be discussed in London next year from September 11th to 13th at an international conference to be held as a cooperative effort of professional societies from Australia, Belgium, Canada, Denmark, France, Great Britain, Holland, India, New Zealand, Norway, South Africa, Sweden, Switzerland, and the United States. Preliminary plans indicate that subjects to be discussed will include recent information on physical properties of gases and gas mixtures pertinent to their heat transfer characteristics, measurement problems related to heat transfer, mass transfer, heat transfer by sweat and film cooling, condensation at high speed flow, heat transfer to liquid metals, and the analogy method for the solution of conduction problems.

Plans for Western Hemisphere participation are being arranged by the Joint Committee on North American Participation, which consists of representatives from a number of organizations, including the American Institute of Physics, the American Physical Society, and the Engineering Institute of Canada. Administrative details are being coordinated by the American Society of Mechanical Engineers.

SPECTROSCOPY

Amsterdam will be the scene of an international conference on spectroscopy at radiofrequencies next September from the 18th through the 23rd, according to an announcement from Holland. Organized by the Netherlands Physical Society and supported by the International Union of Pure and Applied Physics, the conference program will be built around a number of introductory lectures on nuclear, paramagnetic, and ferromagnetic resonance and on precision determination of atomic and molecular constants with radiofrequency methods. Sectional meetings have been scheduled for discussions of these lectures and related matters. Further information may be obtained from the secretary of the organizing committee, Professor Dr. J. de Boer, Bunsenstraat 98, Amsterdam-O.

NEW BRITISH JOURNAL

OPERATIONAL RESEARCH QUARTERLY

During the war, both in this country and in England, scientists representing a wide variety of fields were engaged in the outstandingly successful program known as "operational research". Scientific methods and techniques of analysis were applied to a broad category of problems involving the relative behavior of men, machines, and environment. The object was to arrive at a reliable qualitative understanding of situations in order to remove as much of the guesswork in military planning as possible. Examples of the results obtained by these means may be found in the history of mass bombing raids and of the convoy system of protection against submarine wolf-packs.

It has been widely suggested that similar analytic methods might profitably be applied to the peacetime problems of government and industry, and to some extent, at least in Great Britain, operational research has been a continuing project. In an effort to bring together in a single place as much as possible of the information relating to operational research that is now spread thinly throughout the scientific and technical literature, the Operational Research Club of London issued in March Vol. I No. 1 of a new journal of abstracts of published material bearing on the subject. It will appear four times a year.

The *Operational Research Quarterly* is planned as a small, concentrated journal, but each issue is to contain an original review article relating to one branch or another of the field. The first of these, contributed by P. M. S. Blackett, reviews generally the methodology and organization of operational research.

The *Quarterly* is produced under the joint editorship of Max Davies and R. T. Eddison and lists as editorial advisors a number of experts in many fields of operational research. Those interested in obtaining further information should address inquiries to the editors at 25 Buckingham Gate, London, S. W. 1, England.

GRANTS AND AWARDS

RESEARCH CORPORATION

Of the 35 Research Corporation grants in aid of research to colleges, universities, and scientific institutions in the United States announced on May 1, roughly one-third have been given in support of physics or closely related fields. These include projects to be carried out variously at the University of California, Barat and Lake Forest Colleges in Illinois, Yerkes Observatory of the University of Chicago, Kalamazoo College, Mississippi State College, the University of Missouri, the University of North Dakota, Linfield College in Oregon, the Pennsylvania State College, and Texas Western College.

These awards, which include both Research Corporation General Grants and Frederick Gardner Cottrell Grants to smaller institutions, bring to a total of about $350,000 the funds distributed since last November when the last announcement of grants was made. During the 38 years since the non-profit organization was founded, Research Corporation has distributed more than $5,000,000, including grants of the Corporation-administered Williams-Waterman Fund for research aid, generally in the fields of chemistry, physics, mathematics, and engineering. Those interested in further information should address inquiries to C. H. Schauer, Assistant Director of Grants, Research Corporation, 405 Lexington Avenue, New York 17, N. Y.