CLASSIFICATION [redacted]

CENTRAL INTELLIGENCE AGENCY

INFORMATION REPORT [redacted]

FOR OFFICIAL USE ONLY

REPORT [redacted] STAT

COUNTRY

SUBJECT Nuclear Physics

ACQUIRED USSR

DATE OF [redacted]

DATE DISTR. 30 Sept 1948

NO. OF PAGES 3

NO. OF ENCLS. (LISTED BELOW)

SUPPLEMENT TO REPORT NO.

[redacted] STAT

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SOURCE Russian book, Meson, edited by I. Ye. Tamm, State Publishing House for Technical and Theoretical Literature, Moscow and Leningrad, 1947. (Information specifically requested.)

THE MESON

This book is designed for physicists and students working in the field of the physics of cosmic rays. The following is an extract translation of portions of the preface and the table of contents.

The authors of this collection are scientists working in the Theoretical Section of the Physics Institute imeni P.N. Lebedev of the Academy of Sciences of the USSR. The articles were written in 1945 and 1946.

The first article, by I. Ye. Tamm, concerns the general characteristics of the problem of the meson, the present state of knowledge about cosmic rays, and an account of the motives behind our plan for the study of this problem and behind this collection of articles.

The article by M.A. Markov introduces basic data on the relation of the intensity of cosmic rays to the place of observation (elevation above sea level, geomagnetic latitude, etc.), and discusses the problem of the sign of the charge and of the nature of the cosmic rays first penetrating the earth's atmosphere.

The following group of articles is devoted to the general properties of the meson. The article of D.I. Blokhintsev and F.E. Nemirovskiy is a review of the information available on the mass of the meson. The article of V.L. Ginsburg is a review of experimental data on the dispersion of mesons caused by the nonelectromagnetic interrelation of mesons with atomic nuclei. The article of Ye. L. Feynberg deals with the spontaneous disintegration of mesons.

Since the present-day cascade theory of electrono-photon showers of cosmic rays is already adequately represented in the literature, it was not been included in this collection of articles. See S.Z. Belen'kiy,

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Shower Processes in Cosmic Rays (to be published soon), and Rossi and Greisen, Cosmic Rays (a Russian translation of this monograph is available)/. Still, these theories and their applications are well represented in this collection. The same holds true with respect to the problem of the losses of energy by charged particles upon the ionization of the medium through which they pass. Here, although the basic theories of these effects are well known, the work of E. Fermi in 1940 on the relation of loss during ionization to the density of the medium is not yet adequately covered in Russian-language literature, and since the Wick monogram for the computation of this effect is not readily available, this collection contains a review by P. Ye. Kunin, the greater part of which is devoted to the Fermi effect.

Following the article of P. Ye. Kunin, there are two articles by S.Z. Belen'kiy on the electron showers formed by mesons. The first of these two articles concerns itself with showers of a small number of particles (up to 40). The second deals with larger showers, or the Hoffmann Impact, the study of which makes possible a series of conclusions on the spin of the meson.

Our information on the problems which are presented in the last three articles is by no means as detailed and reliable as that on the problems presented in the first part of this collection, but the problems themselves are of great importance.

The article by S.Z. Belen'kiy and L. Ye. Lazareva deals with comparatively recent discoveries, as yet insufficiently investigated, which are of great importance in the formation of a general theory of cosmic rays, and in the problem of the meson in penetrating rays, a significant part of which consist of mesons.

The article of V. L. Ginsburg on "stars" in cosmic rays devotes itself to the fission of atomic nuclei by cosmic rays, especially by mesons, and also to the general problem of neutrons and protons in cosmic radiation.

The final article by V.L. Ginsburg deals with the present status of the theory of the meson and, in particular, with the various hypotheses now being advanced on the nature of mesons.

All the authors whose works are contained in this collection are either first- or second-generation students of Leonid Isaakovich Mandel'shtam, to whose memory this collection is dedicated.

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