which in turn has a chance of producing a pair (electron and positron). The secondary electron, if sufficiently energetic, can again emit a photon and so on. The main problem is to determine the average number of electrons leaving a layer of given thickness and the fluctuation (second moment) of this number.

The problem in its full generality is prohibitively difficult. Since 1937 when the fundamental papers of Bhalha and Heitler and of Carlson and Oppenheimer appeared there were several attempts to treat the problem by postulating simplified models. None of these proved to be too satisfactory for heavy elements at low energies and the author proposes a new model which he claims gives in some cases good agreement with experimental data. Although it is impossible to give an understandable description of the author's model without going into great detail, it must be said that the model is much simpler than the rather formidable mathematical introduction would lead one to believe. In fact, the reviewer is somewhat puzzled by the inclusion of the first three chapters (Survey of the Theory of Stochastic Processes, The General Theory of One-Dimensional Stochastic Processes, The General Theory of Multi-Dimensional Stochastic Processes). The general theory presented in these chapters (mainly a review and some extension of the work of W. Feller and O. Lundberg) is by itself of considerable mathematical interest but in no way essential to the understanding of the author's model discussed in Part II. The second part of the book also contains a discussion of the older models, a readable account of the physical theory of cosmic radiation (dealing with the elementary processes of photon emission and pair production), and a final chapter comparing theory with experiments. There are two appendices: one on exponentiable matrices and one on numerical computation of the integral from zero to x of exponential $(t^2)dt$.

The agreement with experiments, which is always the final test of every physical theory, is difficult to judge. It may, however, be of interest to report that quite recently R. R. Wilson of Cornell University attacked the problem of cosmic ray showers by a statistical method (referred to often as the "Monte Carlo" method) which consists of imitating by an artificial game of chance the stochastic process of shower formation. The results have confirmed many experimental facts but have also contradicted some of Arley's conclusions.

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Books Received

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