

centration camps. Recently a number of Warsaw professors perished as victims of undeserved persecution. "To this black record of German persecutions a new page has been added—the persecutions of Lwow. Executions and concentration camps for Polish men of science—that is what the German

'crusade in the defence of civilization' has brought with it." In view of these new German crimes which bear full witness to a total degeneration of Hitlerite Germany, we feel sure that men of science in all free countries will wish to join in this solemn protest by Polish savants in Great Britain.—*Nature*.

SCIENTIFIC BOOKS

THE ELECTRIC SPARK

The Mechanism of the Electric Spark. By LEONARD B. LOEB and JOHN M. MEEK. xiii+188 pp. 43 figures. Stanford University Press. \$3.50.

THE book is divided into three chapters, dealing respectively with the Townsend theory of the spark discharge, the streamer theory and the calculation of breakdowns in air. The first chapter develops the background necessary to a complete understanding of the problem, the second describes the point of view which the authors have been especially instrumental in developing, and the final section may be regarded as a discussion of certain practical applications.

The authors begin with a critique of the Townsend theory of the progress of an electrical discharge between two surfaces, and examine the regions of validity of this theory. They review the pertinent considerations and show at what points the observed facts depart from simple theory. They conclude that the mechanism envisioned by Townsend, which is known to be quite successful in explaining phenomena at low pressures and small distances, as for example in certain particular cases in Geiger counter action, do not apply in air at high pressures and big gap-lengths. Time-lags are discussed. The amount and nature of the departures of observation from theory suggests criteria to which a more comprehensive picture of the mechanism must conform.

In the next section, the authors develop the picture of the formation of streamers in a discharge. They point out the sources of error in past experiments, such as lack of stability control of potential sources, inaccuracies in voltage-measurement and of gas-purities. The properties of streamers are explored, as are the corollary effects due to overvoltage, branching and time-lags. The ion densities necessary for streamer propagation are computed and photo-effects are discussed. Finally the full development of a lightning stroke is described, and it is shown how the various considerations developed will explain the observed phenomena.

The final chapter deals with the applications of the theory to the actual calculation of breakdowns in gaps. Many examples are given, and the comparison of theory and observation is presented. The effect of pertinent factors such as air-density is discussed. The

case of the breakdown in coaxial cylinders is considered at some length, this case being of practical importance in electrical power transmission problems; and finally, corona discharge is briefly considered.

On the whole the book contains a useful summary and digest of discharge theory, and should be of especial value to those working with the various aspects of spark discharges. Possibly owing to the incidence of the present emergency on all scientific work, the book shows some signs of haste in preparation, as a number of amusing statements have appeared which the authors would undoubtedly have altered had time been available. For example, the high speed ions are cited on page 39 as traveling at the incredible speed of 1.3×10^{-8} cms/sec; a sentence on page 56 ends with a reference to "... positive ions of a questionable sort," and the name of the firm by which the junior author was employed was spelled in the title page as the "Metropolitan Vicars Company." On the other hand, there is no doubt that the authors have done a good piece of work, and give a useful presentation of a subject on which they may be considered authorities.

SERGE A. KORFF

BARTOL RESEARCH FOUNDATION,
SWARTHMORE, PA.

METEOROLOGY

Dynamic Meteorology. By BERNHARD HAURWITZ. 365 pp. New York: McGraw-Hill. 1941. \$4.00.

THIS book appears at an opportune moment. In recent years the science of meteorology has suddenly moved into the limelight from a state of comparative obscurity. The demands of civilian and military aviation and of a vastly expanded maritime activity have led ever increasing public circles to a realization of the significance of accurate weather forecasts and of the influence of the atmosphere upon innumerable activities of man.

The book gives an account of the analytical tools used by the meteorologist. Apart from offering to the professional a number of methods and formulae presented for the first time in a text-book, it should be of value to anybody who in the course of his work comes in contact with phenomena in the atmosphere. Although the presentation is essentially mathematical,