

calories according as we use buffer salts or proteins for the neutralisation. Thus the combined heat of the two reactions may be anything from 200 to 375 calories—anything from one-half to the entire heat actually observed to accompany the process in muscle. For reasons which he gives in the text, Prof. Meyerhof takes the value 290 calories, but we feel that no amount of logic will compensate for uncertainty in the primary measurements.

The text includes 26 tables and 66 diagrams. The printing is well done, on good paper, but the binding is bad. There are two bibliographies; one contains 125 references to work performed in the author's laboratory, and the second contains 296 references to other work. There exists at the moment no treatise on muscle chemistry, in any language, so complete and up-to-date as this book.

PHILIP EGGLETON.

### Our Bookshelf.

*Annales de l'Institut Henri Poincaré: recueil de conférences et mémoires de calcul des probabilités et physique théorique.* Vol. 1, Fasc. 1. Pp. 74. (Paris: Les Presses Universitaires de France, 1930.) 35 francs.

THE Henri Poincaré Institute invites leading scientific workers to lecture on recent progress in mathematical physics. The "Annales", of which the first number has just appeared, will contain a French translation of these lectures. In the present number we have Einstein on the unitary field theory, C. G. Darwin on the wave theory of matter, and Fermi on the theory of radiation.

Einstein's lecture is addressed to mathematicians, in the hope of interesting them in a theory as yet very incomplete, but offering magnificent possibilities of development. He cannot account for certain identities that he has discovered, and he appeals to geometers to come to his aid. There is no possibility of verifying the theory by experiment until a certain mathematical problem has been solved.

Problems in quantum theory can be treated by the wave mechanics of de Broglie and Schrödinger, or by more abstract methods based upon the general theorems of analytical dynamics. Darwin considers that wave methods have the advantage of enabling one to deal intuitively with phenomena too complicated for mathematical treatment. The object of his lecture is the development of this intuitive power.

In the third lecture, Fermi shows how a uniform method can be applied to problems of interference and of the Compton effect, of which the first set are usually treated by classical methods and the second by quantum mechanics. The starting-point is Dirac's concept of the atom and radiation as forming a single system, the energy of which is the sum

of three terms, due respectively to the atom alone, to the electromagnetic field, and to the interaction of the two.

Future issues will contain lectures by Born, Debye, de Donder, Kostitzin, Lévy, Pólya, and Volterra.  
H. T. H. P.

*The Magneto Manual: a Practical and General Reference Work for Automobile Engineers, Aeronautical Engineers, Mechanics, Apprentices, Chauffeurs, Car-Owners, etc.* By H. R. Langman. (Lockwood's Manuals.) Second edition enlarged. Pp. xii + 246. (London: Crosby Lockwood and Son, 1930.) 7s. 6d. net.

IN many internal combustion engines the ignition of the explosive mixture is effected by means of an electric spark which is produced by a small machine called a magneto. The great demand for these machines for motor and aero engines has led to a very close study of the principles on which they work, and this has resulted in great improvements in their design. This book will prove useful to all engaged in motor engineering. The author wisely does not describe the functioning of any particular type of magneto, but confines himself to general remarks and a description of the outstanding features of the best types in everyday use. The trend of invention and industrial activity is in the direction of perfecting old types rather than the introduction of new types. In this edition a useful chapter has been added which gives a simple description of the theory of the high tension magneto. Many sketches are given depicting common faults. These should prove a help to driver owners of cars in maintaining their magnetos in good working order. The neon gas spark tester, the working of which depends on the low electric strength of neon, is described.

*Metalliferous Mine Surveying.* By Thomas G. Hanton. Pp. xii + 224. (London: Crosby Lockwood and Son, 1930.) 15s. net.

THE fundamental problem in mine surveying is the connexion between the surface and underground surveys and their relations to the boundaries of the property. In this book, which, unfortunately, the author did not live to see published, a successful effort has been made to present clearly and accurately modern methods of mine surveying with special reference to the correlation of the various parts of the work involved. Careful and practical descriptions of the instruments used are given, followed by details of survey practice and methods of preparing plans and sections and written records. Later chapters deal with stope surveys, estimation of ore reserves, and borehole surveying. The whole treatment is well proportioned, clearly written, effectively illustrated, and copiously provided with examples and calculations. Colliery surveying is not specifically dealt with, but the metalliferous mine surveyor has here a thoroughly up-to-date guide to all the leading features of his varied profession. The work was written by an Australian surveyor who had a wide experience, and his book represents the successful accomplishment of a difficult task.