

attitudes of rest in British moths, predaceous insects and their prey. A subject like the last, for instance, worked out by the cooperation of many naturalists, commends itself as zoological work of the soundest sort; it brings together a mass of trustworthy information in regard to insect natural history, it has an obvious bearing on the theory of selection, and it makes towards supplying a trustworthy basis for practical measures. Three of these interesting bionomical memoirs are contributed by Dr. F. A. Dixey, two by the Hope professor, and one each by Messrs. T. R. Bell, A. H. Hamm, S. L. Hinde, W. J. Kaye, and S. A. Neave. Three papers by Dr. Longstaff contain records of observations—chiefly bionomic—on insects met with in various parts of the world. Then follow papers, chiefly of a systematic nature, on Blattidæ by Mr. R. Shelford, on "grasshoppers" by Dr. J. L. Hancock, on beetles by Commander J. J. Walker. After these the volume ends, as it began, with bionomical inquiry, from which modern entomologists are seldom far away. We cannot look over a volume like this (reviving our recollections, in some cases, of papers we had read before) without feeling afresh that the entomologist, more, perhaps, than most naturalists, has his finger on the pulse of evolution. The Hope Reports show that he is not unaware of his great opportunities.

Calcul graphique et nomographie. By M. d'Ocagne. Pp. xxvi+392+xii. (Paris: Octave Dion, 1908.) Price 5 francs.

THE "Encyclopédie scientifique" of which this book forms one volume is intended ultimately to consist of 1000 volumes divided into 40 sections, written by specialists in different sciences, and edited by Dr. Toulouse. While aiming at the completeness of an encyclopædia, it differs from most publications bearing that name in that it consists of small volumes, each treating of one subject, instead of bulky volumes, each containing a number of widely diverse articles.

In this volume M. d'Ocagne deals with graphical methods of computation, a subject in the development of which he has himself played an important part. It is pointed out that such methods are sufficiently accurate for the solution of most problems, financial calculations and certain geodetic operations constituting an exception, though even in these graphic methods may play an important part. The first part of the book deals with graphical algebra and graphic methods of integration, the second with nomography. The latter subject is treated from two points of view, between which a kind of principle of duality exists—the method of concurrent lines, and the method of collinear points. In the former the relation between three variables is determined by the intersection of the lines corresponding to constant values of the respective variables; in the latter three straight or curved lines are scaled, and the simultaneous values of the variables are represented by collinear points on the scales which can be read off by laying a ruler across them. In Prof. d'Ocagne's hands this method has effected quite a revolution in simplifying numerical approximations, and it has the merit of being easily extended to more than three variables.

Mythenbildung und Erkenntnis. By G. F. Lipps. Pp. viii+312. (Leipzig: B. G. Teubner, 1907.) Price 5 marks.

THIS is an interesting contribution to the literature which in recent times has been filling up the gap between mathematics and philosophy. In it the author traces the origin of mythical superstitions in primitive races and their subsequent replacement by the critical methods of exact analysis. He further discusses the

application of symbolic methods to the representation of phenomena connected with the universe, with existence, and with thought. The book forms a suitable sequel to Poincaré's "Science and Hypothesis," and is published in the form of the third of a series of books bearing the title of Poincaré's volume. While covering a somewhat different field, Dr. Lipps's method of treatment is more constructive in character. He has attempted to build up a connected theory rather than to ask the invariable question, Why?

The Old Yellow Book. By Charles W. Hadell. Pp. viii+cclxii+345. (Washington: Carnegie Institution, 1908.)

THE first part of this large volume consists of a complete photographic reproduction of the "Yellow Book," now in the library of Balliol College, which formed the theme of Browning's poem, "The Ring and the Book." This is followed by an English translation, as well as translations of two other sources of information relating to the Franceschini murder case, and an essay by the author on "The Making of a Great Poem." The photographic reproductions, as the author points out, are of first importance to secure the scholarly world against the possible destruction of the unique copy in Balliol College. At the same time, seeing that a few blemishes, due to creases in the original book, have been removed, and that the pages have been re-numbered, it seems a pity that the present book was not properly guillotined before being issued to the public.

LETTERS TO THE EDITOR.

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On the Magnetic Action of Sun-spots.

It was perhaps to be expected that the recent discovery of the Zeeman effect in the spectra of sun-spots should revive the idea of a direct magnetic action originating in the sun and observable at the surface of the earth. A numerical estimate is therefore called for as to the magnitude of the disturbance which might be produced by such a direct action.

A solar vortex involving electric circulation, and consequently magnetic fields, will be most favourably placed to produce magnetic action if its apparent position is at the centre of the solar disc. If we consider the disturbed area, which for convenience I shall call the spot, as a magnetic pole, the first question that arises refers to the whereabouts of the opposite pole. We may place it at the further end of the solar diameter passing through the spot, and thus again assume the most favourable conditions. If, now, the vertical forces on the solar surface are treated as made up of a series of spherical harmonics, we need only consider the first term from which forces varying inversely as the cube of the distance are derived, because the numerical values of the forces derived from the higher terms are, at the distance of the earth, at least a hundred times weaker. Write, therefore, for the vertical force F

$$F = B\mu + \text{higher terms,}$$

where μ is the cosine of the solar co-latitude measured from the spot.

The coefficient B is determined in the usual way by

$$\int_{-1}^{+1} F\mu d\mu = \frac{2}{3}B.$$

As the spot is confined to a small region, for which $\mu = 1$, and F has only finite values over this region and at the opposite pole, we may for the left-hand side of the