8. In conclusion I should like to direct attention to the final statement of Mr. Sclater. Having made the (incorrect) supposition that the late-Tertiary group of the eared seals has been checked in its northward advance in the Atlantic by a connection of South America and Africa, he says that "all these facts, *with the one exception* of the supposed Atlantic barrier, would tend in favor of the *now generally accepted* doctrine that the principal masses of land and water are not of modern origin, but have existed mainly in their present shapes *throughout all ages.*" No less than three errors are contained in this single sentence, namely: 1. It is impossible to derive from the distribution of a group of Tertiary animals any conclusions as to the shapes of the principal continental masses *throughout all ages.* 2. This statement would hold for the Tertiary time only if we consider that the connection of South America and Africa, which is supposed by Mr. Sclater, is no important feature. Mr. Sclater admits that this Atlantic barrier forms an exception to the rule; but, I should say, such an exception throws the whole rule aside. 3. It may be that Mr. Sclater himself has accepted the 'doctrine' of the persistency of the continents, but I protest most vigorously against calling such a 'doctrine' *generally accepted.* A dogma (and this would be the proper name for it) that has been contradicted by students in zoogeography, such as Baur, Beddard, Neumayr, v. Ihering and others (and I should add, which is rejected by almost *all* geologists) cannot be regarded as 'generally accepted.'

The distribution of the Seals and Sirenians, it is true, has never been investigated from a scientific standpoint, but there are only a few distributional features which seem to be anomalous at first sight (Sirenia, Otariidæ), and even these may be explained readily. The Sirenia point to conditions existing in the beginning of the Tertiary period, and it is well known that this group existed in the Eocene epoch. The distribution of the Otariidæ is analogous to what has been called (improperly) 'bipolar' distribution. They represent the somewhat rare case of an Antarctic group of littoral animals which has crossed the tropics along the western coast of America and reached the northern Pacific. As to the latter fact I refer to a special paper published by me recently, which is especially devoted to this peculiarity of distribution.*

Arnold E. Ortmann.
Princeton University, June, 1897.

THE POTTER'S WHEEL IN AMERICA.

My neglect to mention the *Kabal*, pointed out in Mr. Mercer's letter (Science, p. 919), was not an oversight, but for two reasons: First, as he mentions, because the word with that meaning does not occur in the Maya dictionaries of the sixteenth century; and secondly, because the *Kabal* is not a potter's wheel in its results or in a technical sense.

This is shown in Mr. Mercer's own work, 'Hill Caves of Yucatan,' p. 77, where he quotes Captain Maler as saying that he 'had found no trace of the potter's wheel in the old specimens of pottery,' anywhere in Yucatan. Mr. Mercer brought no potsherds from ancient deposits to contradict this; and according to his own words the *Kabal*, as used to-day, does not give 'the regularity of outline' which is the artistic aim of the potter's wheel. (P. 164, note.)

D. G. Brinton.

SCIENTIFIC LITERATURE.

The Cambridge Natural History. Edited by S. F. Harmer, M.A., and A. E. Shipley, M.A. Vol. II., Flatworms, etc. Macmillan & Co. 1896. 8vo. Pp. xii+560, 257 figs.

Volume II. of the Cambridge Natural History, the third of the series to make its appearance, deals with those classes which are usually grouped together as Worms or Vermes, and Polyzoa. The different classes are treated by specialists whose names are familiar in connection with the subjects assigned to them. The work is shared by seven authors, as follows: Platyhelminthes and Mesozoa, by F.W. Gamble, pp. 1–96, Figs. 1–47; Nemertinea, by Lilian Sheldon, pp. 97–120, Figs. 48–61; Nemathelminthes and Chætognatha, by Arthur E. Shipley, pp. 121–194, Figs. 62–105; Rotifera, Gastrotricha and Kinorhyncha, by Marcus Hartog, pp. 195–238, Figs. 106–120; Archiannelida, Polychæta and Myzostomaria, by W. Blaxland Benham, pp. 239–344, Figs. 121–186; Oligo-

* Zool. Jahrb. Syst., Vol. 9, 1896, pp. 571–595.

chæta and Hirudinea, by F. E. Beddard, pp. 345–408, Figs. 187–210; Gephyrea and Phoronis, by Arthur E. Shipley, pp. 409–462, Figs. 211–231; Polyzoa, by Sidney F. Harmer, pp. 463–533, Figs. 232–257.

Fifty pages of Mr. Gamble's account are devoted to the Turbellaria, twenty-three pages to Trematodes, eighteen to the Cestodes and five to the Mesozoa, the major part dealing with the groups in which the author is most at home. A detailed description is given of the structure and habits of a common Polyclad (*Leptoplana tremellaris*) and a common Triclad (*Planaria lactea*), together with a general account of the different groups. It is to be regretted that the same method was not followed with the Rhabdocœles, with Mesostoma as the type, a cosmopolitan form, which has, perhaps, been the object of study more than any other Turbellarian. The account, on the whole, is the best that we have for the Turbellaria. But a few slips and inaccuracies occur, chief among them being the statement that land planarians are 'cylindrical,' and that "freshwater planarians vary from a quarter to half an inch in length," whereas it is known that among the common European species, *Dendrocœlum lacteum* (*Pl. lactea* of the author) reaches a length of 26 mm. (Iijima), *D. punctatum*, 5 cm. (Hallez), and *Pl. gonocephala*, 25 mm. Again, the 'sucker' of *Pl. lactea* is said to have been 'discovered by Leydig' instead of v. Baer or Dugés. Among the Rhadocœles no mention is made of the fact that certain members of the genus *Mesostoma* are viviparous, and of the relation between this condition and the occurrence of the thin-shelled 'summer eggs.'

The chapters dealing with the Trematodes and Cestodes are comparatively meagre, but are an excellent epitome of our knowledge of the parasitic flatworms. Structural matters are scarcely touched upon, the account consisting chiefly of life-histories, the life-history tables being novel and instructive. *Distomum magnum* is said (p. 4.) to be parasitic in sheep (!).

The Nemerteans are dismissed by Miss Sheldon in twenty pages, a small space for so important a group, particularly in the light of the extensive recent researches. The classification adopted is that of Hubrecht, although the more rational one of Bürger is printed, with the excuse that this author's work appeared too late to be adequately considered. One paragraph devoted to 'palæontology' tells us that Nemerteans 'are unknown in a fossil state.'

Mr. Shipley's chapters on the Nemathelminthes and Chætognatha are valuable compilations of the natural history of these orders, and the recent researches on the problematic Acanthocephala are here brought together for the first time. Synoptic tables are given of the species of Chætognatha, and Conant's list of American species finds a place in an appendix at the end of the volume.

In Professor Hartog's account of the Rotifera and their allies the most striking thing is the author's declaration of the relationships of the Rotifera with the lower Platyhelminths and his comparison of them with the *Pilidium* of the Nemerteans, the older idea of arthropod affinities being abandoned. A pleasing feature is a brief description of the technique for the preservation of Rotifers.

The most extensive section in the book comprises Dr. Benham's chapters on the Archiannelida, Polychæta and Myzostomaria. Under the second of these classes the general account is prefaced by a detailed description of a typical Polychæte (*Nereis pelagica*), as in Mr. Gamble's account of the Turbellaria. The classification employed is a modification of that proposed by by the author in 1894, according to which the various families are grouped under two 'branches' and seven 'sub-orders.' Following a general account of the structure and biology comes a systematic portion in which the various sub-orders are illustrated by descriptions of British species.

Mr. Beddard's account of the Oligochæta offers nothing new of importance, the chapter being an excellent summary of the general part of the author's recent monograph, and a good sketch of a group to our knowledge of which he has contributed so much.

The same author's chapter on the Hirudinea is not so carefully done as that on the earthworms, and at times is careless and almost flippant in its treatment. *Inter alia* we learn such bits of natural history as that "the former extensive use of the leech has led to the trans-

fer of its name to the doctor who employs it," and that "it has been suggested, however, that the term was applied rather by way of analogy." Again, in reading of the intelligence of the land-leeches of Ceylon we learn that "they may ascend herbs and shrubs to gain a better outlook when they are aware of an approaching footstep." The most valuable part of Mr. Beddard's account of the Hirudinea is his discussion of their relationships with the Oligochæta.

The chapters of Mr. Shipley on the Gephyrea and Phoronis are among the best in the book, and his treatment of the affinities of these troublesome forms is most full and impartial. The account also includes a table of genera and species.

The excellent final chapter by Mr. Harmer on the Polyzoa is restricted to British forms, and concludes with a detailed table for the determination of British genera.

As a whole, the work is to be most highly commended and is the best general account of 'worms' that has appeared. If the scope of the book had been somewhat more extended so as to include, in all classes, other than British forms, its value and usefulness would have been much enhanced. In criticism it can be said that the book is not altogether well balanced as to the space alloted to the different classes, and that a general introduction on affinities and classification in addition to the tables which precede the text would have been of value for the student. The illustrations, with a few exceptions, are of the highest order and include many new ones; as exceptions may be mentioned Figs. 8 and 14, which are little more than caricatures.

W. McM. Woodworth.

The Swastika. By Thomas Wilson. Washington, Government Printing Office. 1896.

This extensive monograph of about 250 pages, with 25 full plates and 374 figures in the text, is from the report of the National Museum for 1896. The author is the Curator of the Department of Prehistoric Archæology in the Museum, and well known to students in that branch. His subject is the hooked cross, that figure called in English the 'fylfot' (four footed), and in the East Indies, *swastika*. This the author, in his sub-title and throughout his volume, claims as 'the earliest known symbol,' and prepares to point out its 'migrations.'

The subject is by no means a new one, as Mr. Wilson's appended bibliography abundantly shows; but there have been so many explanations of the origin and significance of this figure, and so many claims made for it as of historic value in indicating early migrations or relations of tribes, that it was quite desirable that a calm survey and clear analysis of them should be made. Mr. Wilson, by his wide reading and acquaintance with prehistoric archæology, is eminently qualified to accomplish this task; but by reason of his general theories on the origins of culture has, it must be said, failed in his presentation.

Not that his volume lacks in thoroughness, or that it is not of very high value to anyone who would trace the prevalence of this figure in both the Old and the New World. In these respects the work is satisfying; it overflows with quotations, and is accurate and attractive in its numerous illustrations. But all this wealth of resource is, in the opinion of many close students of the topic, seriously injured by two hypotheses of the author which continually interfere with the accuracy of his perspective.

These are, first, that the *swastika* is always to be regarded as a symbol; and, secondly, that it 'migrated' from one or two centers and was in some sense a racial or ethnic figure.

Both of these hypotheses have been shown to be unquestionably erroneous by the latest researches in the decorative art of both hemispheres. The 'fylfot' in American, Polynesian and Asiatic art has been proved by Von den Steinen, Stolpe, Regnault and others to be as purely decorative as it is in modern wall paper. It has been found in Semitic and Egyptian art, whence scholars of Mr. Wilson's school have tried to exclude it. Like other simple linear figures, its origin is not single but multiple; and both as a picture and a symbol it has stood for widely diverse objects. The mysteriousness which has been thrown about it disappears on an examination of its origins and meanings in many different tribes wide apart in geographic location; and had the author of the volume before us, so excellent in many respects, sur-