

are disposed of and some errors criticised, it does not incorporate that earlier work.

In the descriptive part of the memoir thirty-nine species are enumerated, of which thirty are regarded as new, and are exhaustively described. The general remarks refer to eighty-eight species—the thirty-nine species treated by the author, and forty-nine species dealt with in the earlier reports—and furnish the evidence of the author's main conclusions. These conclusions are that the deep-sea starfish of the Bay of Bengal and Arabian Sea are much more Phanerozonia than Cryptozonia, and that their geographical affinities, so far as they can be discerned at all, are exclusively Indo-Pacific, with a slight Hawaiian touch.

Of the new species described by Prof. Koehler, five are separated as types of new genera. These are Johannaster, which is placed with very justifiable hesitation among the Plutonasteridæ, for some of its characters suggest a pentagonasterid connection; Phidaster, which seems scarcely distinct from Psilaster; Sidonaster, which agrees in all points with Porcellanaster, except that, as in other porcellanasterid genera, the elements of the cribriform organs are papillar instead of lamellar; and Circeaster and Lydiaster, both of which are Antheneids having the abactinal plates of the disk much smaller than those of the rays.

It may be thought that the limits of some at least of these genera are cut too fine to last; and of the descriptions of species it may almost be said that they are accurate expositions of specimens rather than impressive definitions of nature's products; but such is the way of systematic zoology nowadays.

The memoir is most bountifully and most beautifully illustrated by the author's own hand; the plates, which are thirteen in number, are quite above criticism.

*Antimony: its History, Chemistry, Mineralogy, Geology, Metallurgy, Uses, Preparations, Analysis, Production, and Valuation; with complete Bibliographies for Students, Manufacturers, and Users of Antimony.* By Chung Yu Wang. Pp. x+217; illustrated. (London: C. Griffin and Co., Ltd., 1909.) Price 12s. 6d. net.

MR. WANG observes in his preface that a metallurgical work in English by a Chinese author is unusual. After reading the book, the conclusion is irresistible that English metallurgists would gain if Chinese authors were more numerous. Mr. Wang has treated his subject with the greatest respect, and has drawn up with methodical care a complete treatise which will be very useful to all students of the subject. The long and apparently exhaustive bibliography at the end of each chapter would alone give the book a right to a place on metallurgists' shelves, but in many cases the facts are sufficiently set forth in the present work.

The author carried out some practical tests of the latest volatilisation process of extracting antimony from its ores, which was patented last year by M. Herrenschildt, and seems to have been much impressed by its merits. The account of these tests is, however, almost the only original matter in the book, which is mainly a compilation of previously published material, printed without comment. Its merits lie chiefly in the logical sequence and the accuracy of the extracts.

*Étirage, Tréfilage, Dressage des Produits métallurgiques.* By M. Georges Soliman. Pp. 164. (Paris: Gauthier-Villars and Masson et Cie., n.d.) Price 3 francs.

THIS interesting little work, one of the well-known "Aide-Mémoire" series, deals with its subject from a practical point of view. It is divided into five chapters, the first considering shortly the general mechanical properties of metals and alloys such as

tensile, shock, bending, hardness, and torsion tests. Chapter ii. shows the influence of annealing and of cold work. Chapter iii. is devoted to "étrage," or drawing, defined as "an operation which has for its object the completing of work done by rolling and giving to the metal a cross-section which cannot be obtained by rolling;" after the manner of wire-drawing ("tréfilage," chapter iv.), which is a special case of drawing where the cross-section is circular. Chapter v. gives a short account of methods of straightening ("dressage"). A. McW.

*Nutrition and Evolution.* By Hermann Reinheimer. Pp. xii+284. (London: John M. Watkins, 1909.) Price 6s. net.

THIS is an essay on the importance of nutrition as a factor in evolution, and the author is in good company. For was it not Claude Bernard who said, "l'évolution, c'est l'ensemble constant de ces alternatives de la nutrition; c'est la nutrition considérée dans sa réalité, embrassée d'un coup d'œil à travers le temps"? To have had this thesis worked out in a methodical manner would have been great gain, but the author is not strong in scientific method. He has gleaned far and wide to illustrate "the evolutionary aspects of nutrition," and while he has a crow to pick with most of his authorities, who have not the "central key of a uniform analysis," he uses them when they suit him to back up his conclusion "that in its silent effects nutrition is one of the most formidable factors in the shaping of individual and racial destinies." The conclusion is sound, but we cannot say this of many of the arguments.

#### LETTERS TO THE EDITOR.

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#### Bessel's Functions.

I ONCE stated that a good style of writing English is not a strong point amongst British mathematicians, and the justice of this remark is exemplified by Prof. Hill's letter on this subject (NATURE, July 8), since it contains the phrases Meissel's tables, Smith's tables, Aldis' tables, Isherwood's tables, which are correct; and Bessel functions, British Association tables, which are wrong. It is not in general permissible in English to employ a proper noun as an adjective, for the rules of grammar require either the use of the genitive case, or the conversion of the noun into an adjective, as in the words Newtonian, Lagrangean.

The British Association is one of the most important societies in the British Empire; it long ago discarded the insularity of our ancestors, and has become cosmopolitan in its operations. It is therefore not too much to expect that it will conform to the rules of grammar in its publications, and employ its influence in encouraging a good literary style.

I do not understand what Prof. Hill means by Neumann's functions. I believe that Neumann was the first mathematician who studied the properties of zonal harmonics and allied functions of degree  $n+\frac{1}{2}$ , where  $n$  is zero or a positive integer; but the subject was afterwards taken up and greatly extended by Prof. W. M. Hicks in connection with circular vortex motion. Hicks calls these harmonics *toroidal functions*, which is a much better phrase, since it puts in evidence the fact that these functions are connected with the potentials of *anchor rings* or *tores*.

There is also another class of functions which are zonal harmonics of complex degree  $m-\frac{1}{2}$ . These have been studied by Hobson (*Trans. Camb. Phil. Soc.*, vol. xiv., p. 211), who calls them *conal harmonics*.

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Fledborough Hall, Holyport, Berks, July 9.