

written for students having an elementary knowledge of the subject.

The plan of the book includes a statement of the problem, its financial aspect, its mechanics, the scientific side and the practical side as well. The scope of the problem, choice of site, character of installation, type of engine and boiler, and their design, construction, erection and operation, are excellently stated, including the finance of the case. Finance is taken as the controlling factor, and the costs of steam-power are indicated and illustrated. Rankine's method of apportioning the engine to its work, as a financial proposition, is described, its fatal defect shown, and the later and corrected system of use of true 'curves of efficiency' is described. In designing, the method of Professor Barr of ascertaining the results of general experience in determining the factor of 'safety' is described and its results given.

A brief and well-arranged statement of the fundamental principles of thermodynamics is presented and an excellent outline of the scientific side of the problem is laid down. The great defect of the real engine, its internal waste of heat and steam, is well described, as are the results of later investigations to determine its amount and its laws of variation.

R. H. THURSTON.

*Catalogue of the Fossil Bryozoa in the Department of Geology*, British Museum (Natural History). By J. W. GREGORY. The Cretaceous Bryozoa, Volume I. London, Longmans & Co. 8vo. Pp. 457. 17 pl.

The long list of British Museum (Natural History) catalogues has received another welcome addition in the *Catalogue of the Cretaceous Bryozoa*, Volume I., by Dr. J. W. Gregory.

This catalogue is devoted entirely to descriptions and figures of the Cretaceous bryozoa, the groundwork, terminology, classification, etc., having been laid by the author in an earlier work of the same series: *The Catalogue of the Jurassic Bryozoa in the British Museum (Natural History)*, published in 1896. In a second volume, to appear later, the author hopes to give a general introduction to the Cretaceous bryozoa, a list of localities with their horizons, and a bibliography. The catalogue is intended

to be complete, to include every recorded species, though the large number of inadequate descriptions by early writers and their unrecognizable figures will leave much in doubt. It is a question whether science would not be a gainer if much of this early work could be authoritatively set aside. The desire to conform too strictly to the law of priority or to do justice to early workers sometimes results in even greater injustice to later workers.

The present volume treats only of the Cyclostomata. This division Dr. Gregory raises to ordinal value and divides into the suborders: Tubulata, with the families Diastoporidæ, Idmoniidæ, Entalophoridæ, Eleidæ; Cancellata, with families Horneridæ, Petaloporidæ; Dactylethrata, with families Clausidæ, Terebellariidæ, Reticuliporidæ.

The large size of the present volume is itself evidence of the fine collection which the British Museum has accumulated. The author notes the large additions recently made to the collection and laments that an American collection was received too late to be included in this volume. Doubtless the second volume will supply the deficiency. No work of importance has been done on bryozoa from secondary and tertiary formations of America since the work of Gabb and Horn in 1860-62. The interesting bryozoan fauna of the Cretaceous marls of New Jersey has begun, however, to attract the attention of workers in this country as well as abroad.

The greatest of the many merits of the volume under consideration is the great care taken in collecting full synonymy and in giving careful, accurate descriptions with measurements. The rather complicated mode of relative measurements which the author employed in the volume on the Jurassic bryozoa he has abandoned for the simpler and more easily comprehended plan of absolute measurements. We believe the author adopts the correct position when he says that dimensions, while important, seem to him of far less value than is attached to them by some continental writers, who make them the chief specific distinctions. It is no doubt true that, in some groups, each species is very constant in its dimensions, while in other groups species are very variable in this respect. But the same is true of other charac-

ters; a character which is constant and therefore reliable for purposes of differentiation and classification in one suborder or family, in another may be highly variable. This fact must be recognized in framing classifications.

The author retains with a few minor changes the classification proposed in the catalogue of the Jurassic bryozoa. In the present state of knowledge some scheme of classification is a necessity and yet but a temporary expedient. Our knowledge of the derivation, purpose, function and relative importance of the various structures found in fossil bryozoa is still too imperfect to enable an abiding classification to be framed. After all, the main purpose of a classification is to provide a scheme for maintaining an easy grasp upon relationships.

At the present time the best work that can be done is just the kind which our author does in this work, the giving of careful, close, accurate description with some account of the variations exhibited by a 'species,' with figures from which the form can be certainly recognized, and the careful, accurate, critical examination of the literature to weed out the synonyms. The author describes a considerable number of new species, showing that even in this direction there remains a great deal to be done. To the student of the bryozoa in general and the Cretaceous bryozoa in particular, the present volume must prove an indispensable working requisite.

J. M. N.

*The Human Nature Club; An Introduction to the Study of Mental Life.* By EDWARD THORNDIKE, Ph.D. Longmans, Green & Co. 1901. 8vo. Pp. 235.

This is an attempt to present the main facts of psychology in the form of a story, or at least of dialogue. Of this aspect of the essay the author says: 'Dramatically it is an atrocity.' Such frank disclaimer makes any further comment ungracious. And yet it would certainly have added much to the success of the undertaking not to have so entirely ignored the artistic factor in the presentation. It must, however, be viewed merely as a pedagogic aid to the popularization of the study of psychology, and particularly as a means of arousing interest

in the significance of the every-day mental life among every day people. As such it is an eminently sound and helpful presentation. It is also more than this, as it presents a perspective of the importance of some of the factors of mental assimilation, which bear the mark of close and original thinking. This is particularly true of the discussion of the formation of habits, with reference to the effect of special upon general training. In the main it is an appropriately eclectic treatment of the primary elements of our mental nature. The Human Nature Club is a very artificial assemblage of persons, who discuss, with rare singleness of purpose, 'what the brain does,' and the 'things we do without learning' and 'the different ways of learning'; consider the senses and memory and attention and trains of thought and mental imagery and suggestion and imitation and our emotions and our actions and character, and some other yet more complex and deeper questions. Socrates would certainly be shocked at the modern speed with which conclusions are drawn from a few sporadic, and yet significant, illustrations, with but little allowance for analysis or dialectic. But this is inevitable, if the book is to cover its ground; and after all, the characters of the dialogue do not really draw these conclusions, but only restate them from such worthy authorities as James and others. The psychological matter is well grounded, suggestive, discriminatingly used and clearly set forth. The query will arise with reference to the proof of the pudding, which according to modern notions is not in the eating, but in the digestion thereof. That the book may prove palatable to certain palates, it is easy to believe; but whether persons with sufficient maturity of mind to consider psychological questions at all should not be at once placed on more strenuous diet, is a question upon which teachers of psychology are likely to hold diverse opinions. Yet with whatever training they may desire their pupils to approach the study of mental phenomena, it would be mere perversity to fail to recognize that there is in this country a large class of persons who do 'study' psychology, are genuinely interested, and are likely to be approachable only by ap-