

entomologists, but their autoptic acquaintance with our fauna is relatively poor; and while there are ample materials here, there appears a remarkable paucity of students inclined to serious work in this direction. Lists we have in number, but in them almost invariably figure *Acridium*, *Caloptenus*, *Oedipoda*, *Stenobothrus*, *Mantis*, etc., genera which in their now restricted application do not or hardly exist in North America.

There has been some excuse for this, since the broad scope of Stål's work, embracing the Orthoptera of the globe, rendered work upon exclusively American material difficult to one without means of reference to extra-American insects, collections of which are uncommon in this country, though easily obtainable by any one with means. Still, it is strange that no one having access to the museums in our larger cities or universities has undertaken to apply the modern system of classification to one or another of the families or subfamilies of American Orthoptera. He would have earned merited applause from all students in this field.

One attempt, indeed, was made to collate what could be known of the *Acrididæ*, but it was before Stål began his work, and it may almost be classed as a hindrance. Now, however, the field is open, for Brunner von Wattenwyl, whose collection of Orthoptera is the richest in the world, published a year ago a *Révision du Système des Orthoptères*, through which, by means of the tables given by him of an exceedingly simple character (sometimes in practice one finds them too limited), one may quickly group his collection in a natural order, and by means of the literature to which reference is briefly made, determine the generic position or affinities of whatever he has before him. The way for a revision of any group is therefore clearer than ever before, and our entomologists will have none but

themselves to blame if they do not hereafter better coördinate their work with that of the European writers.

SAMUEL H. SCUDDER.

CAMBRIDGE.

SCIENTIFIC LITERATURE.

An Elementary Treatise on Theoretical Mechanics.—Part I., *Kinematics*; Part II., *Introduction to Dynamics*; Part III., *Kinetics*.—By ALEXANDER ZIWET, Assistant Professor of Mathematics in the University of Michigan.—8vo.—Macmillan & Co., London and New York, 1893-94. Pp. viii+181, viii+183, viii+236.

Since Lagrange set the model for analytical mechanics in his *Mécanique Analytique*, a little more than a century ago, there has been no serious lack of good elementary works devoted to that science. Most conspicuous of the latter is Poisson's *Mécanique* (1811, 2d ed., 1833), which was undoubtedly more widely read and followed than any other work during the first half of this century. It is only recently, however, that the great advantage of the analytical over the geometrical method in mechanics has come to be generally recognized by authors and educators. The influence of Newton has long held English writers to the geometrical form of the *Principia*. To this, nevertheless, there are a few noteworthy exceptions, the most important of which in the present half century is probably Price, whose volumes on analytical mechanics (*Infinitesimal Calculus*, Vols. III. and IV., 1862) have done excellent service.

Along with the remarkable growth of science in general during the past thirty years a great impetus has been given to mechanics. This is traceable chiefly to two sources, namely: first, the development of the Faraday-Maxwell view of electricity and magnetism; and, second, the thought-inspiring qualities of the great work of Thomson and Tait on *Natural Philosophy*.

The latter treatise and the *Electricity and Magnetism* of Maxwell have stimulated a wonderful activity in the study of mechanical ideas; and, as a result, a number of high-class elementary books on pure mechanics have appeared during the past decade. The work of Professor Ziwet is one of the best of this class. It is up to date and distinctively in touch with the progressive spirit of the age. In accordance with the modern order of presentation, Part I. is devoted to kinematics, Part II. to statics as a special case of dynamics, and Part III. to kinetics. No one acquainted with the magnitude of theoretical mechanics would expect to find a complete treatise even in the space of 600 octavo pages. It goes without saying, in fact, that he who would now do battle in the fields of mechanics should be armed with a battery of treatises. But it must be admitted that the work of Professor Ziwet covers the ground exceedingly well, giving a fairly good idea of nearly every important principle and process from the composition of vectors to the kinetics of variable systems. The mode of treatment, though distinctly analytical, is tempered by the introduction of geometrical illustrations and analogues where they serve to give clearness and fixity of ideas. A noteworthy feature of the work is the large number of references to the literature of the science. These references alone make the work one of the best that can fall into the hands of the enterprising student. The typography and press work are worthy of the distinguished publishers under whose auspices the volumes appear. A few misprints and a few inaccuracies of expression are visible in the work; but these are inevitable in a first edition of such a treatise. A speedy demand for a second edition will, we hope, enable the author not only to remove these trifling defects, but also to add an index, which will much enhance the value of the work for purposes of reference.

R. S. W.

From the Greeks to Darwin.—An outline of the development of the evolution idea.—By HENRY FAIRFIELD OSBORN.—Columbia University Biological Series 1.—New York and London, Macmillan & Co., 1894. Pp. 259. \$2.00.

This is a timely book. For it is time that both the special student and the general public should know that the doctrine of evolution has cropped out on the surface of human thought from the period of the Greek philosophers, and that it did not originate with Darwin, and that natural selection is not a synonym of evolution.

The author divides his work into six sections, entitled respectively: The anticipation and interpretation of nature; Among the Greeks; The theologians and natural philosophers; The evolutionists of the eighteenth century; From Lamarck to St. Hilaire; Darwin.

It is clearly shown that evolution has reached its present completeness as a result of a slow growth during the past twenty-four centuries, and that Darwin owes more to the Greeks than has been hitherto recognized by any of us. The Greek philosophers in biology, as in geology, anticipated, at least in some slight degree, modern scientific philosophy. The doctrine of continuity in the organic and inorganic world, anticipations of the monistic philosophy, and of the evolution of life, were taught by Thales and Anaximander, while Aristotle spoke of some of the factors of transformation, and even clearly stated the principle of the survival of the fittest, though he afterwards rejected it.

The father of evolution was Empedocles, who believed in spontaneous generation, that plants came first, that animal life long after budded forth from the plants, and in his poetry Osborn finds the germ of the theory of the survival of the fittest or of natural selection. Democritus perceived the principle of adaptation of single organs