

The Jurassic fauna consists largely of species apparently peculiar to Mexico. It is characterized by numerous forms of Aucella and Perisphinctes, about half of which are described as new species. This paper, following so soon after the discoveries of Diller and Hyatt in California, is of much interest to American geologists.

The authors have been unfortunate in the hands of their lithographer. The plates are of little use; some of the figures are scarcely recognizable.

J. B. WOODWORTH.

An Introduction to General Biology. SEDGWICK and WILSON. Second Edition. 1895. New York, Henry Holt & Co.

The original Practical Biology of Huxley and Martin, written in 1875, has stimulated the production of a large growth of text-books and laboratory manuals. Huxley and Martin attempted to present the fundamental facts of biology to the student by the study of a series of typical animals and plants, beginning with the simplest and ending with the more complex. Nevertheless, this logical method proved impractical and in a later and too-much enlarged edition the authors (or rather their successors, with Huxley's approval) reversed the order of treatment of the subject. The higher forms were first studied and then the student was led down through a series of simpler forms. Huxley said, however admirable the first method followed by him had been 'it had its defects in practice.'

Sedgwick and Wilson adopted, in 1886, a third order of procedure in the first edition of their General Biology. Two common forms, the fern and the earthworm, were first thoroughly described as introductory to a later study of other animals and plants; and a second volume was promised, dealing with the other forms. This second part has never appeared and its publication has been finally abandoned.

A second edition of the General Biology of Sedgwick and Wilson has just come out and will be welcomed by all those who have learned through experience the great value of the first edition.

In the present edition the principal changes

are as follows: (1) The book has been enlarged so as to include a series of unicellular forms (Amœba, Infusoria, Protococcus, Yeasts, Bacteria). (2) The laboratory directions given in the first edition have been omitted. In their place an admirable appendix has been added. The appendix describes the best methods in preserving and preparing the forms described in the text; a large number of valuable and practical suggestions are also added. (3) The order of presentation has been reversed. The earthworm now comes first and then the fern follows.

In the first edition, and in the present edition also, the student is introduced to the subject of General Biology by a chapter dealing with the differences between living and lifeless things, 'believing that Biology should follow the example of Physics and Chemistry in discussing at the outset the fundamental properties of matter and energy.' If we consider, however, the unsettled state of mind of biologists at present on these fundamental questions and, further, the presumed ignorance of the student of all knowledge of living things we cannot but think this method of presentation open to question.

The next two chapters in the present edition, following the order of the first edition, deal with a study of a series of heterogeneous objects illustrating 'the structure of living things' and 'protoplasm and the cell.' The *pièce de résistance* is then introduced.

The reason assigned by the authors for offering first the earthworm 'lies in the greater ease with which the physiology of an animal can be approached.' However true this may be from the student's standpoint, it presents certain difficulties to the conscientious teacher, for in reality very little physiology is actually known for the earthworm, 'save by analogy with higher animals.'

For ourselves, we prefer *at present* the old sequence with the plant first and the animal later, admitting wide scope for individual taste. Practically, we have found that the new edition adapts itself to our own idiosyncrasies and works backward just as well as forward.

Most important additions and corrections have been made to the description of the structure of the earthworm. The accounts of the circulatory and nephridial systems have been

extended. The former imperfect description of the male reproductive organs has been corrected. The histology of the nervous system is more fully described and the results brought up to date according to Retzius and Lenhossék.

The description of the development of the earthworm from the egg is more fully given, and a description of the internal phenomena of cell-division is added.

The process of regeneration in the earthworm is incorrectly, or at least very imperfectly, described. "The earthworm is not known to multiply by any natural process of agamogenesis. It possesses in a high degree, however, the closely related power of regeneration; for if a worm be cut transversely into two pieces the anterior piece will usually make good or regenerate the missing portion, while the posterior piece may regenerate the anterior region" (page 73). Rarely or never will this happen in the earthworm! If the anterior piece be sufficiently long, *i. e.*, if it contains more than 24 segments it may then regenerate posteriorly. But the corresponding posterior end will not under these conditions regenerate. A shorter anterior piece will not regenerate. A posterior piece having lost less than 15 anterior segments may regenerate and replace all or part of those lost.

Few and unimportant changes seem to have been added to the description of the structure and physiology of the fern.

The brief descriptions of the unicellular forms are most admirable and a most important addition has been made to the older volume. A statement in the chapter devoted to yeast calls for correction (page 188). "It was supposed for a long time by Pasteur and others that yeast could dispense with free oxygen in its dietary. It now appears that this faculty is temporary only." * * * Pasteur himself on the contrary has given the results of a most elaborate series of experiments to demonstrate that yeast *can not permanently* dispense with free oxygen in its dietary.

Chapter XVI on bacteria and Chapter XVII on 'a hay infusion' give in few words a thoroughly good summary of the part played by bacteria in the world's economy.

The first edition of the General Biology filled

a unique place amongst our text-books and the new edition fulfills all the uses of the first edition. It brings the latter down to date and we venture to prophesy that it will meet with a hearty reception. The volume is a much-needed and most valuable addition to our best text-books. It is well printed and illustrated, and the descriptions of the authors are always clear and concise.

T. H. MORGAN.

SCIENTIFIC JOURNALS.

AMERICAN CHEMICAL JOURNAL, NOVEMBER.

JACKSON and Grindley contribute further results of their work on the action of sodic alcoholates on chloranil. They describe the methods of preparation, properties and reactions of a number of acetals derived from substituted quinones.

Orndorff and Cameron find that the substance formed by the action of sunlight on anthracene in benzene, is dianthracene and not a paranthracene. They obtained the substance in pure condition and made a thorough crystallographic study of it. Interesting points of resemblance and difference were brought out by a comparison of the measurements of the axial ratios and angles. All attempts to bring about the transformation by any other method than that made use of failed.

Hitherto all the determinations of the molecular weight of paranthracene have been made by the freezing-point method. The vapor-density method could not be used, as paranthracene is converted into anthracene at its melting point (244°). The results obtained by the freezing-point method varied greatly, and were very unsatisfactory, on account of the slight solubility of the substance in all the solvents used. The authors find that, by the use of the boiling-point method, using pyridine, anisol and phenetol as solvents, good results can be obtained.

Campbell has prepared copper oxide containing a small amount of palladium, and finds that the combustion of gases takes place at a lower temperature when he uses this mixture than when the oxygen is introduced in the form of gas.

Kastle suggests the use of the dichlor deriva-