tions for the chick, teleosts, amphibia and mammalia, and directions for the artificial fecundation and study of the early cleavage of forms permitting it. Chapter XVII. gives the two most generally used methods for the reconstruction of specimens from sections, namely, reconstruction with wax plates and geometrical reconstruction.

Memoranda are given at the end of each chapter and these are often more interesting to one familiar with the general working of the methods than the procedure for the methods to which the chapter is devoted, for it is in these memoranda that various adaptive modifications of the methods are given, valuable suggestions as to technique in dissection, the choice of tissues for the purpose in mind, the construction and manipulation of the necessary apparatus, the selection and making up of the reagents required, and, equally important, suggestions as to the most probable causes of failure and the steps in procedure at which special care should be exercised. The substance of the memoranda might, less wisely, have been included in the body of the chapters, but, as the author states, they are, instead, appended to each chapter in order to supply additional information more or less pertinent without obscuring the main features of the methods under consideration.

Of the appendices, the first is devoted to the construction and discussion of the microscope and the optical principles involved in its use, with directions for its manipulation and an alphabetically arranged list of the more commonly used microscopical terms and appliances. In the second appendix is given a series of formulæ well chosen as representing some of the more efficient and frequently used reagents, including fixing and hardening fluids, stains, indifferent fluids, dissociating and decalcifying fluids. After each fluid is noted its peculiar advantages and some of the tissues and purposes to which it is best adapted. The third appendix is a tabulation of a large number of tissues and organs arranged alphabetically in systems with concise directions in appropriate columns for the obtaining, fixing and after-treatment of each; while the fourth appendix is especially devoted to directions for the collection and preparation of the various materials necessary for a general course in zoology. The last appendix consists merely of four conveniently constructed reference tables of equivalent weights and measures.

The book is amply illustrated as to the different apparatus required and, while one might criticize the prominence with which the names of firms making the apparatus frequently stand out in the cuts, a little advertising is allowable in exchange for the excellence of the cuts used.

On the whole, the extended scope of the book, together with its conciseness of construction and reasonable price, renders it highly commendable, and, in my opinion, it will be found useful to a larger number of people than any other book of its kind at present in existence in English. Since each experienced worker in microscopical technique has his own devices of manipulation which work best for him, there are, of course, some instances in which the author's 'steps' and 'tricks' may be disputed as being the most efficient. Professor Guyer modestly recognizes this. However, with such workers, the book will be found full of helpful suggestions, new to many. The general student will find that all the methods recommended will yield good results when the directions are intelligently followed, and the fact that the author has striven to make the book thoroughly practical: 'to omit everything that is not essential, and, above all, to give definite statements about things,' has resulted in a much-desired brevity of treatment and obviation of bulk.

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Recent Progress in the Study of Variation, Heredity and Evolution. By Robert Heath Lock. Pp. 299. London, John Murray. 1906.

At this time when the systematic botanists and zoologists differ greatly in regard to their large number of tissues and organs arranged reader will find the book under review a most useful help in arriving at sensible conclusions. Mr. Lock is well fitted to discuss the subjects

announced in the lengthy title of his book. He is intimately acquainted with the recent work in breeding, and has, himself, made some valuable contributions to knowledge. As a student at the Royal Botanical Gardens in Peradeniya, Ceylon, and later in Cambridge he has worked with Indian corn and with peas.

The book begins with an introduction in which are briefly discussed: Linnæan species, Jordan's species, variation, mutation, discontinuity of species, the work of Mendel and evolution theories. Later chapters are largely given to a fuller discussion of the topics here introduced. The first half of the book is rather elementary, intended presumably for the general reader. Natural selection, evidences of evolution and 'biometry' are treated in detail. It must not be supposed that the treatment of these topics is purely perfunctory. Even in the driest parts of the work there are sharp and valuable criticisms of the theories of the day. The author pays his respects to the theories of 'protective resemblances,' 'mimicry' and 'inheritance of acquired characters.' He shows the inadequacy of natural selection for the origin of species and prepares the reader for the subject evidently most dear to his own heart—'Mendelism.'

In describing the operation of Mendel's Law our author is at his best. He makes clear some things not generally understood in regard to the position of the 'Mendelians.' Thus (p. 180) he says: "dominance is by no means an universal phenomenon. * * * In a considerable number of instances the heterozygote is found to exhibit an appearance which is more or less intermediate between the types of character shown by the parents."

On page 205 it is shown that new forms arising in the midst of an old-established species need not be 'swamped' by intercrossing. A chapter on 'Recent Cytology' is chiefly an elementary account of the cell, but some discussion is given of the probable relation between chromosomes and Mendelian characters. Weismann's views and those of the 'Mendelians' are contrasted (pp. 261–262). The discussion of the alternating generations of plants as the 'x-generation' and '$2x$-generation' (p. 270 et seq.) will interest some readers, while his remarks on the improvement of the breed in the human race will not be taken more seriously than intended by the author.

The book has few glaring faults. There is no bibliography. This is most unfortunate, since the work is so well calculated to introduce college students to the problems of heredity and evolution. Certainly a few of the more useful works might have been named. On page 92 Davenport's 'Statistical Methods' is referred to as 'Structural Methods.' Dr. MacDougal is called Macdougal (p. 139). Perhaps 'nitch' (p. 286) is not a misprint for 'niche' but an example of reformed spelling. A lack of subheadings makes the book less easily used for reference than it should be.

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SCIENTIFIC JOURNALS AND ARTICLES

The opening (January) number of volume 8 of the *Transactions of the American Mathematical Society* contains the following papers:

G. A. MILLER: 'Generalization of the groups of genus zero.'

F. MORLEY: 'On reflexive geometry.'

G. A. MILLER: 'The groups in which every subgroup is either abelian or hamiltonian.'

H. F. BLICHFELDT: 'On modular groups isomorphic with a given linear group.'

W. E. STORY: 'Denumerants of double differentiants.'

A. RANUM: 'The groups of classes of congruent matrices, with application to the group of isomorphisms of any abelian group.'

CLARA E. SMITH: 'A theorem of Abel and its application to the development of a function in terms of Bessel's functions.'

W. B. FITE: 'Irreducible linear homogeneous groups whose orders are powers of a prime.'

L. P. EISENHART: 'Applicable surfaces with asymptotic lines of one surface corresponding to a conjugate system of another.'

THE December number (volume 13, number 3) of the *Bulletin of the American Mathematical Society* contains: Report of the September Meeting of the San Francisco Section, by W. A. Manning; 'Projective Differential