The index is unusually complete, which greatly aids the use of the volume.

The work contains but little that will interest the farmer, nor can it be expected that any person could prepare such a work, on account of the necessary technicalities of the subject, but it is just the thing to fall into the hands of the botanist, the professor of agriculture and students pursuing an agricultural course.

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Elementary Course of Practical Zoology. By the late T. Jeffrey Parker and W. N. Parker. London, Macmillan & Co. 1900. Pp. 608; 156 illustrations.

Although this book was published abroad about eighteen months ago, it is practically recent in this country, having been introduced by the New York publishers during the present academic year. It is not yet widely known and has not received from American teachers and students of zoology the attention which it deserves.

Almost twenty-five years ago Huxley wrote in the preface to his now classical 'The Crayfish as an Introduction to the Study of Zoology' these words: 'I have desired to show how the careful study of one of the commonest and most insignificant of animals leads us, step by step, from everyday knowledge to the widest generalizations and the most difficult problems of zoology; and, indeed, of biological science in general.' Every zoologist knows how well Huxley succeeded in introducing the readers of 'The Crayfish' to the great principles and methods of the science. Unfortunately, the work was better adapted for reading than for the modern laboratory method of teaching, and hence this masterpiece among introductory books on zoology has become a reference work. But its central idea has made a deep impression on the teaching of zoology, and it is therefore with pleasure that we welcome a book in which the pupils of the master of zoological teaching have given his suggestion a new and more complete development in adaptation to the laboratory method. In the 'Practical Zoology' by the Parker brothers we now have in the form of a handbook for students an introduction to zoology based upon Huxley's idea of a careful study of a common animal considered from the standpoint of the several phases of zoology. But the frog and not the crayfish is the chosen type.

One might infer from the title that the book is exclusively a laboratory manual; but, on the contrary, there are extensive descriptions of the types to be studied in the laboratory and good presentation of zoological principles, so that the book is really a text-book and laboratory manual combined.

In Part I., consisting of 228 pages, the frog is thoroughly treated with regard to anatomy, histology, physiology, embryology, classification and ecology—the whole forming a splendid introduction to fundamental zoological principles and methods of study.

Following the study of the frog as an introduction to the study of zoology, Part II. deals with *Amœba, Hœmatococcus, Euglena, Paramœcium* and its allies, *Hydra* and hydroids earthworm, crayfish, mussel, *Amphioxus,* dogfish and rabbit. The book closes with some general points in cytology and embryology which have been incidentally referred to in earlier parts of the work.

Most of the descriptive chapters in Part II. are essentially reprints from T. J. Parker's well-known 'Elementary Biology,' even the illustrations of the book being reproduced with additional ones from Parker and Haswell's 'Zoology.' But, although the material is familiar, the setting is decidedly new; and these latter chapters supplement the introductory study of the frog so as to form a well-rounded course in general zoology.

Excellent practical directions for obtaining, preparing and studying zoological materials form appendices to all the chapters, and these are so arranged that the laboratory study proceeds hand in hand with the reading of the descriptions. Those teachers of the American school who have been influenced by the laboratory methods of both Agassiz and Huxley will criticise these directions for practical study, in that the work of the student is practically limited to mere verification. However, the laboratory teacher who wishes to stimulate the spirit of investigation will find no difficulty in

suggesting modifications and substitutions which will give the students some work for investigation in place of continuous verification.

The greater part of the descriptive sections of the 'Practical Zoology' is from the pen of the late T. Jeffrey Parker, and we note all the characteristics which made his 'Elementary Biology' so popular. It is an interesting and excellent book; and, in the reviewer's opinion, a better single volume offering a year's course in general zoology has not yet appeared.

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SOCIETIES AND ACADEMIES.

NEW YORK ACADEMY OF SCIENCES.

SECTION OF ASTRONOMY, PHYSICS AND CHEMISTRY.

AT the May meeting of the Section, Professor R. W. Wood, of the Johns Hopkins University, read a very interesting paper on 'Anomalous Dispersion and its Bearing on Astrophysical Problems,' making special reference to the explanation of the flash spectrum in this way.

Dr. William S. Day, Columbia University, read a paper on 'An Experiment Relating to the Application of Lagrange's Equations of Motion to Electric Currents.'

The experiment described was analogous to one mentioned by Maxwell in his 'Treatise on Electricity and Magnetism,' Section 574, Volume II. Maxwell's experiment was made for the purpose of discovering whether or not in the expression for the kinetic energy of an electric current there was a term depending on the product of the current and the velocity of the conductor. In a single linear circuit having only one degree of mechanical freedom, the expression for the kinetic energy of the system in the most general case would be of the form

$$T = \tfrac{1}{2} I\dot{x}^2 + K\dot{x}\dot{y} + \tfrac{1}{2} L\dot{y}^2$$

in which $\dot{x}$ is the velocity of the mechanical coordinate, $\dot{y}$ is the current, I is a quantity of the nature of mass, L is the self-induction of the circuit, and K is the coefficient of the term consisting of products. Just what mechanical coordinate is to be represented by x is partly a matter of choice. Maxwell chose one whose velocity means a motion of the wire in the direction of its length. There is one other coordinate which seems to be geometrically possible, although it is not one that is naturally suggested by the most satisfactory hypotheses now in vogue as to the nature of an electric current. This other coordinate is one such that its velocity means a rotation of the wire carrying the current around its axis of figure. If x has this meaning, then if the coefficient K is not zero, Lagrange's equations of motion show that if a current is suddenly started or stopped in a wire there would be an impulsive torque acting on the wire. The experiment was performed to look for such an effect if it existed. A straight piece of aluminium wire 30 cm. long and 0.25 cm. in diameter was suspended by a quartz fiber in such a way that it was free to rotate, and by means of mercury cups a current could be passed through it at pleasure. No effect of the kind considered was detected. If the value of K expressed in C.G.S. electromagnetic units, and referred to a centimeter length of the wire, had been as great as 0.00002, it could have been detected.

S. A. MITCHELL.

SCIENTIFIC JOURNALS AND ARTICLES.

THE May number (Vol. VIII., No. 8) of the *Bulletin of the American Mathematical Society* contains the following articles: 'The March Meeting of the Chicago Section,' by T. F. Holgate; 'Concerning Angles and the Angular Determination of Planes in 4-Space,' by C. J. Keyser; 'Note on the Sufficient Conditions for an Analytic Function,' by D. R. Curtiss; review of Scheffers's 'Theory of Surfaces,' by J. M. Page; review of 'Recent Books on Mechanics,' by E. B. Wilson; 'The Galois Theory in Burnside and Panton's Theory of Equations,' by B. S. Easton; 'Shorter Notices'; 'Notes'; 'New Publications.' The June number (Vol. VIII., No. 9) contains: 'The April Meeting of the American Mathematical Society,' by F. N. Cole; 'The Infinitesimal Generators of Parameter Groups,' by T. J. I'a. Bromwich; 'On the Parabolas (or Paraboloids) through the Points Common to two Conics (or Quadrics),' by T. J. I'a. Bromwich; 'A Second Definition of a Group,' by E. V. Hun-