principally in South America, Asia and Africa.

Although the parasite has been known for more than half a century, very little importance was attached to it until within the last decade. As knowledge of these forms has recently advanced, so have they become very important, not only to the physician on account of their rôle in the etiology of disease, but also to the zoologist who is desirous of knowing their finer structure, their life history and their genetic affinities.

One of the important phases of the article is a discussion of the method of transmission of the parasite. Doffein points out that there are three probable modes of transmission.

The first mode is by means of cysts or spores. In such cases it would be necessary for the parasites to wander through the walls of the blood-vessels out upon the skin or mucous membrane and there form cysts. They must then be taken up with dust, water or food by an intermediate host and be carried to the vertebrate host. At present no facts are known to support this theory, except that certain authors have described stages in the blood and internal organs, which they interpreted as cysts. But these are probably nothing more than degeneration stages.

The second method is through coitus, as is the case with Spirochæta and the trypanosome causing dourine. Doflein is of the opinion that this mode of transmission may be possible in all trypanosomes, and hence regards it as an important point to be investigated.

The third method is the passive transmission through the agency of blood-sucking invertebrates. Experiments show that insects are capable of passively carrying the trypanosomes from an infected to a sound patient. Since the work of Schaudinn (1904) on the transformations of the owl trypanosome in the stomach of the mosquito, investigators have thought that the trypanosome must pass through a complicated life-cycle in an invertebrate host. Setting out with Schaudinn's work before them, they have tried to fit their discoveries to his interpretations. They have searched for male and female forms, believing that there must be a life-cycle similar to malarial forms in the mosquito. But no one has ever yet seen male and female, if they exist, in process of conjugation, and so the insect is known only to be a passive carrier of the infection.

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The Study of Nature. By Samuel Christian Schmucker. Pp. 315, illustrated. Philadelphia, J. B. Lippincott and Co. 1908. $1.25.

This latest addition to the long list of books designed to guide teachers of nature study will, like many of its rivals, give much help; but still leaves the most pressing problems of elementary school nature study just where they were before its publication. This fact is mentioned not in criticism, but simply to forewarn those who eagerly expect each new book on nature study to make some decided advance towards complete establishment and successful teaching of the subject in all our elementary schools. For such a golden age of nature study we have as yet at most only a prophetic vision.

In the first chapters dealing with the principles of nature study the author follows the most advanced stage of the nature study movement when he urges as essential the observational study of natural things, as far as possible, in their natural relations and chosen for their commonness and abundance rather than for their rarity.

In the chapter on The Real Purpose of Nature Study the author agrees with many other writers in urging nature study as for many individuals a valuable addition to the general culture which is valuable for avocation rather than for the main business of life. Also be believes in practise in accurate observing and stating results as decidedly effective in establishing firm character, and in nature study as a guide to a religious attitude towards nature. All this agrees with the experience of many naturalists, but the doubting educators who have had no experience in scientific study will continue to regard these purposes as vague and not convincing. The

present uncertainties as to the place of nature study in our educational system are to no small extent due to the emphasis on such vague purposes which appeal to few who have not the naturalist's outlook to nature.

Most of the book is devoted to the practical problems of class-room management, materials and arrangement of the course of study. All these chapters are good introductions for the beginner, and especially for students in normal schools. Nine of the ten chapters on materials are devoted to animals and plants, and the tenth deals with popular astronomy. Just why the author has chosen the heavens as the only representative of the physical side of nature is not apparent to the reviewer. The signs of the times indicate that here is a weakness, and that the nature study which may win a permanent place in our elementary education of the future must have a well-balanced mixture of the biological and the physical. The physical is extremely important for interpreting the biological aspects of nature, and to most people it makes a more convincing appeal from the standpoint of every-day life.

The outline of a course in nature study is based on no apparent underlying principles, but like most other outlines published is simply a list of topics taken at random. All principles of continuity, correlation and logical development seem to be neglected. Of course there are those naturalists who urge that nature study should be free from everything resembling the formal work common to the school room; but that kind of nature study has decided limitations and has made little permanent progress in American schools.

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Experimental Elasticity, a Manual for the Laboratory. By G. F. C. SEARLE. 8vo, pp. 187. Cambridge University Press. 1908.

The character of this book can be best seen from its origin. The author has been since 1890 director of the classes in practical physics of the Cavendish Laboratory, and has prepared for his students manuscript notes giving the theory and description of the experiments. He is now collecting these notes, and after rewriting and amplifying them when needed, they are to be published in a series of volumes which will cover the usual field of practical physics. It is appropriate that the first volume should be on experimental elasticity, a subject in which Mr. Searle's contributions are well known.

The volume is divided into three chapters, the first two chapters being theoretical and the third chapter giving detailed descriptions of the methods and apparatus of fourteen experiments in elasticity. The theoretical parts are generally elementary, but the use of calculus methods is not avoided. The theorems and methods of thermodynamics are also used. The sections using these more advanced methods could, however, be easily omitted without interfering with the use of the greater part of the book. The "notes" forming an appendix to the above three chapters give discussions of some of the elementary theorems of mechanics and mensuration. From this we can infer that the more advanced sections may have been added later to make the book more complete. The longest of these "notes" is entitled Hints on Practical Work in Physics, and gives brief, pointed directions on keeping note-books, making diagrams, methods of calculations, adding also an occasional moral hint. Thus the following might well be copied and framed for use in many laboratories:

> A steady hand, a keen eye and a good command of the body are essential in accurate physical determinations; mere intellectual power avails nothing by itself. Any rule of life which deviates from temperance in all things (including work) may be expected to render the hand less steady and the eye less keen and so lead to inferior work. University students whose fingers are deeply stained with tobacco do not, as a rule, become skilful observers, though they may show considerable ability in other ways.

Laboratory courses can not in general be transplanted as a whole, since each laboratory has its own selections of apparatus and experiments—that is, if it is a live laboratory. In the case of elasticity, the variations in forms of apparatus are not great and not funda-