botany for the rapid determination of plants by using one character after another." In carrying out the scheme six tables are given, of which the first is synoptic, while the second deals with the methods of determination of minerals by the aid of polarized light; in the third the morphological character of the minerals is made the distinguishing characteristic, and in the fourth the determination of the crystalline system. In table five the minerals are classified upon crystallographic grounds, and in table six the positive or negative character furnishes the desired clue to identification. To the original work (published in Russian) the translators have added a brief chapter describing a petrographical microscope and its accessories. The work is not intended to be exhaustive, but rather as introductory to the larger works of Rosenbusch and others. To students beginning the study, and particularly to those working without instruction, the book cannot fail to be of great service.

The Mummy; Chapters on Egyptian Funereal Archæology. By E. A. WALLIS BUDGE, L.D., F. S. A. Cambridge, University Press. 404p., with 88 illustrations, 1893, $3.25.

IN his preface the author justly observes: "The preservation of the embalmed body or mummy was the chief end and aim of every Egyptian who wished for everlasting life." Hence, a large proportion of the monuments and remains of ancient Egypt are of a sepulchral character, and an intimate acquaintance with what relates to their mortuary beliefs and ceremonies well nigh exhausts Egyptian archæology.

Impressed with this fact. Dr. Budge has chosen "the mummy" as the one object of study, but this in the widest relations. He begins his volume with a brief sketch of the history of the lower Nile valley, furnishes a list of the dynasties, the cartouches of the principal kings, and a list of the nomes or provinces. Next, beginning with the Rosetta stone as a text, he describes succinctly the discovery of the methods of reading the hieroglyphic writing. This brings him to his immediate subject, the mummy, its preparation and surroundings. Short but satisfactory descriptions are given of such appurtenances as mummy cloth, Canopic jars, the Book of the Dead, *ushabti* figures, sepulchral boxes, vases, toilet articles, scarabs, amulets, figures of the gods and sacred animals, sarcophagi and tombs. Mummies of animals, reptiles, birds and fishes receive some attention, and there are instructive paragraphs on Egyptian writing and writing materials, and the Egyptian numbers and months. The book closes with lists of the more common hieroglyphic characters and determinatives. The whole is presented with great clearness, and with a full, accurate and scientific knowledge of the subject. As a practical handbook to Egyptian archæology, it has no superior, within the lines the author has laid down for himself.

The Outdoor World. By W. FURNEAUX, F. R. G. S. New York, Longmans, Green & Co. 411 p.

Our Household Insects. By EDWARD A. BUTLER, B. A., B.Sc. New York, Longmans, Green & Co. 342 p.

The Industries of Animals. By FREDERIC HOUSSAY. Imported by Charles Scribner's Sons. 258 p., $1.25.

A History of Crustacea. By REV. THOMAS R. R. STEBBING, M. A. New York, D. Appleton & Co. (International Scientific Series, Volume 71). 466 p., $2.00.

DURING the last few years the laboratory naturalist has very largely taken the place of the old student in natural history, and work on biological subjects in general is to-day quite largely carried on in the laboratory by means of the microscope and the dissecting knife. The reason for this can be largely traced to our modern education, which, in trying to introduce biological subjects into educational curricula, must do it in such a way that the student can carry on his work in different branches at the same time. This is hardly compatible with a very widely extended field work. As the result of this laboratory method, laboratory text books and laboratory technic have become well developed and well known, and readily meet the student's requirements. The general public, however, will always be more interested in the side of natural history that treats with animals and plants in a general way, and books to be widely instructive must contain facts never to be learned in the laboratory. Even the laboratory naturalist himself finds relief and pleasure in leaving his scalpel and microscope and turning through the pages of some well written book upon the study of nature on a broader scale. The four zoölogical books above listed represent a better class of the popular scientific books which attempt to deal with phases of nature in a wider way and in a more popular style.

The first of the four is a book designed for boys and young people in general, and has for its purpose the attracting young students to the study of nature. This book attempts to give descriptions and figures of such common animals and plants as a wide awake boy might be able to obtain by ordinary collecting methods. Methods of collection are given, simple and readily obtained forms of apparatus for collection are described, and directions are given the reader as to where and how he may most likely find certain animals and plants. In the different chapters of the book different groups of animals and plants are taken up for discussion and description. The book abounds in figures describing the organisms mentioned, as well as the apparatus used and methods of preservation. The scope of the book covers all types of animals which the boy may be supposed to find, from the smallest (not including microscopic animals) to the largest, and from coelenterates to man. It comprises the study of fresh water, land and marine animals, and is arranged in such a way as to give the boy an interest and a zest in his study of nature in whatsoever line he chooses, and withal a deal of scientific information is given. The book is, in short, just the sort of text book that a boy wants to interest him in natural history, and the figures, many of which are colored, are such as both to attract and instruct.

The second of the four is of quite a different character and is designed as an introduction to entomology. It gives an anatomical and a general account of such common insects as one may find in and around his home. The anatomical description is illustrated by figures and is more or less detailed. Bits of history of different species of insects are introduced, many accounts of interesting habits are described. As the insects are taken up one after another, the author brings up for discussion just the sort of questions which the semi-scientific reader will desire to ask and have answered. He discusses such matters as the poison of mosquitoes; the origin and habits of flies; the distribution and origin of cockroaches; methods of getting rid of many of the insect pests, etc. Quite a number of excellent figures are given illustrating the anatomy, and a few excellent photographic plates of some of the smaller insects are introduced. This book, in short, gives the sort of an account of common insects as the elementary student in entomology may desire to have.

Both of these books being English books, the species described and figured are English species. They are for this reason less valuable to an American student, but at the same time the difference in species between English and American is not so great that the books are not usable here.

The third book is even more entertaining to the gen-

eral reader, treating as it does of the habits of insects and giving little or nothing in regard to the dry details of anatomy. The author attempts here particularly to describe the industrial habits of animals, more particularly those of social animals. He describes the methods of hunting and the methods of carrying of war and the general methods of defence of animals. He gives an account of the various habits possessed by animals of obtaining and storing provisions, describing the habits of gardening ants and agricultural ants, and giving an account of the slavery that exists among certain species of ants as well as their habits of "cattle keeping." He gives an account of the methods for rearing the young; of the methods of building houses and of the material and architecture of the dwellings of various animals; discusses habits of sanitation and defence against diseases. This account is extremely entertaining reading and is full of the most striking incidents. The preacher will find anecdotes for illustration; the lecturer find examples to enliven his lectures; the psychologist will find many facts to ponder over and explain, and every one will find much to interest and to wonder about, so that, on the whole, a more readable book on entomology can hardly be mentioned.

The last of the four has quite a different scope and is of a more technical scientific character. The fact that this is one of the International Scientific Series is enough to determine its high character. The author aims to give in this book a complete account of the higher crustacea (Malacostraca). He was unfortunately, however, obliged to leave out the description of the Amphipoda, since the space assigned to him would not admit of their treatment. This book begins with a careful description of the general anatomy of the crustacean groups, with an outline of their classification. This part of the book is, unfortunately, not illustrated by figures, so that it will be hardly intelligible to one not acquainted with the material beforehand. Then there follows, in separate chapters, descriptions of the various orders, tribes and families of the crustacea and a short account of all of the important genera. Numerous illustrations of more common species are given throughout the book, and the descriptions and history of the different genera will prove of especial value. This volume of the International Scientific Series is an especially valuable book for a student wanting a thorough knowledge of crustacea, for it will enable him to determine the general character and relations of any crustacea which he may find, and in many cases enable him to determine any species at hand, although it does not pretend to be a systematic account of the crustacea. Even a more valuable book will it be for a reference library book. Unlike the other three books above given, this one can hardly be regarded as a readable book, but must be looked on as a work for reference. As such a book it will find a valuable place in the libraries of all students of zoölogy.

Elementary Palaeontology for Geological Students. By HENRY WOODS, B. A., F. G. S. Cambridge, University Press. 222 p., $1.60.

THIS little book is a text-book, designed for the student to use with specimens of fossils in his hands. It gives the general characteristics of the groups of animals important to the palæontologist and a brief description of the most important genera of fossils. It gives also at the close of the discussion of each group an outline history of the group in the past. The book is of value as a guide to a student who has access to a good collection of fossils; but having almost no figures of fossils in it, it is of no use for any other purposes. It is not designed, indeed, for any other purpose, but the geological student will find it a convenient handbook to carry into a museum for reference and study.

—Messrs. Macmillan & Co., of New York, announce for January, 1894, in their "Book Reviews": "The Study of the Biology of Ferns by the Collodion Method; for Advanced and Collegiate Students." By Geo. F. Atkinson, Ph. B., Associate Professor of Cryptogamic Botany, Cornell University. Profusely illustrated. The book is designed for laboratory instruction and for reference on the development and structure of ferns. It consists of