

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 palaeontologist 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

SOFTLY STEALS THE LIGHT OF DAY
when filtered through windows covered with
CRYSTOGRAPHS,
a substitute for Stained Glass that is inexpensive,
beautiful, and easily applied.

20c. per square foot. Samples and catalogue, 10c.
CRYSTOGRAPH CO.,
316 North Broad St., Philadelphia.

BRENTANO'S,

Publishers, Importers, Booksellers.

We make a specialty of technical works in all branches of science, and in all languages. Subscriptions taken for all American and foreign scientific periodicals.

Our Paris and London branches enable us to import at shortest notice and lowest prices. REPORTS OF SCIENTIFIC SOCIETIES, MONOGRAPHS, GOVERNMENT REPORTS, etc. Correspondence solicited.

All books reviewed in SCIENCE can be ordered from us.

SEND FOR A SAMPLE COPY OF BOOK CHAT. A Monthly Index of the Periodical Literature of the World \$1.00 per year.

BRENTANO'S, Union Square, New York
Chicago Washington. London. Paris.

SCIENCE CLUBBING RATES.

10% DISCOUNT.

We will allow the above discount to any subscriber to *Science* who will send us an order for periodicals exceeding \$10, counting each at its full price.

N. D. C. HODGES, 874 Broadway, N. Y.

PISO'S CURE FOR
CURES WHERE ALL ELSE FAILS.
Best Cough Syrup. Tastes Good. Use
in time. Sold by druggists.
CONSUMPTION

ABOUT
MAGIC LANTERNS
ASK US
— WE MAKE THEM.
J. B. COLT & CO.
16 BEEKMAN ST. 189 LA SALLE ST.
NEW YORK CHICAGO, ILL.

BUILDING BOOKS.

DRAWING INSTRUMENTS.

1893 Catalogue

of Books on Building,
Painting, and Decorating,
also Catalogue of Drawing
Instruments and Materials,
sent free on application to

Wm. T. Comstock,
23 Warren St., New York.

TEN BOOKS FOR PRICE OF ONE SEND FOR A CATALOGUE OF THE HUMBOLDT LIBRARY OF SCIENCE.

Containing the works of the foremost scientific writers of the age.—The Great Classics of Modern Thought.—Strong meat for them that are of full age. Single numbers 15 cents. Double numbers 30 cents. Address:—THE HUMBOLDT PUBLISHING CO., 19 Astor Place, New York.

Every reader of "Science" should subscribe for the

AMERICAN ARCHITECT, THE OLDEST AND BEST

Architectural publication in the country. Interesting articles on architecture, Sanitation, Archaeology, Decoration, etc., by the ablest writers. Richly illustrated. Issued weekly. Send stamp for specimen copy to the publishers,

Ticknor & Co., 211 Tremont St., Boston.

1869. THE 1893. Manufacturer and Builder.

Published Monthly. A handsomely illustrated mechanical journal, edited by DR. WILLIAM H. WAHL. Every number consists of 48 large quarto pages and cover, filled with useful information on all subjects of a practical nature. Specimen copy free. For sale by all newsmen. Agents wanted everywhere. Address

HENRI GERARD,
P. O. Box 1001. 83 Nassau St., N. Y.

Pennsylvania Bedford Springs Mineral Water

For Liver, Kidney and Badder Troubles.
For Gravel, Gall Stones, Jaundice.
For Dyspepsia, Rheumatism and Gout.
For Dropsy, Bright's Disease, Diabetes.
For Hemorrhoids, Etc.

It has been used medicinally and prescribed by physicians for nearly one hundred years.

DIRECTIONS:—Take one or two glasses about a half-hour before each meal.

Case One Dozen Half-Gallon Bottles, \$4.50.

Case Fifty Quarts (Aerated), \$7.50.

Bedford Mineral Springs Co., Bedford, Pa.
Philadelphia Office, 1004 Walnut St.

two parts—Part I. is descriptive and deals in full with the life-history of ferns; Part II. deals with methods of study. The descriptive portion of the work is arranged in seven chapters, six chapters being devoted to the Leptosporangiate homosporous Filicineae, and one chapter to the Ophioglossae. The chapters on the ferns trace in detail the development, morphology and anatomy of the gametophytic and sporophytic phases. The text is in no sense a compilation, but is written after a thoroughgoing and serious investigation by the author, using the Collodion Method as a means of bringing the material under contribution, so that in a very large measure it is written from nature revealed by original preparations. One unique feature of the work is the result of a critical examination by the author of the structure of the sporangium in the different orders of ferns and the dispersion of the spores. In the light of this study it is clearly shown that the customary statements regarding the extent of the annulus must be modified. The 163 illustrations are all original from camera lucida sketches, accompanied by a magnified micrometer scale, so that the reader can at once compute the magnification. All of the illustrations of sections are from objects prepared by the Collodion Method, and several of them from preparations made by students of the author during their ordinary laboratory work. The old method of free-hand sectioning rendered it an extremely difficult task even for an expert to make satisfactory sections of the delicate prothalline tissue. The profuse illustrations in this book, representing, as they do, the entire range of development, the chief features of anatomy and a comprehensive treatment of the structure of the sporangia of the different orders, are evidence of the comparative ease with which students may now, by this method, overcome obstacles which heretofore have stood in the way. From the intermediate position which ferns occupy in

the plant kingdom their life-history presents a generalized view of the chief phenomena of plant life, and they are therefore admirably suited for studies of the biological aspect of botany, and form a suitable introduction to this phase of botanical instruction. The book is suited to assist students in laboratory classes in successfully tracing out the more difficult phases in the development of fern organs. The descriptive part affords a convenient means of reference at any step of the work, while the practical part deals with methods, preparation of material and instructions for prosecuting the various phases of the investigation, and is to be used as a laboratory guide. By its use, as first tested by the author in his own classes, the students are enabled to make with precision and accuracy permanent microscopic preparations of all the stages of development. Especial success has been had in adapting the collodion method to the handling of the delicate prothalline tissue, sexual organs and embryo, it being better suited to such delicate tissue than the paraffin method, and the preparation of material can be carried through in less time and with far less trouble. Permanent microscopic sections thus made serve the purpose of study, for future reference, and, if desired, for class illustration. The descriptive part occupies such a prominent part of the book that it will commend itself also to those who do not contemplate the practical study, but desire, in compact form, a much fuller account of fern history than can be obtained in ordinary text-books.

—Charles Scribner's Sons will publish a sumptuous art-work, entitled "Rembrandt: his life, his work and his time," by Emile Michel. Among their other books, nearly ready, are a new book by Dr. Henry M. Field, entitled "The Barbary Coast," a description of a leisurely journey to many interesting points in Algiers, Tunis and Tripoli.

Indigestion

Horsford's Acid Phosphate

Is the most effective and agreeable remedy in existence for preventing indigestion, and relieving those diseases arising from a disordered stomach.

Dr. W. W. Gardner, Springfield, Mass., says, "I value it as an excellent preventative of indigestion, and a pleasant acidulated drink when properly diluted with water, and sweetened."

Descriptive pamphlet free on application to

RUMFORD CHEMICAL WORKS, PROVIDENCE, R. I.

Beware of Substitutes and Imitations.

For sale by all Druggists.

EXCHANGES.

[Free of charge to all, if of satisfactory character. Address N. D. C. Hodges, 874 Broadway, New York.]

I am desirous of obtaining the following back numbers of *The Auk*: One copy each of Oct., 1885; July, 1886; January, 1887; July, 1887; April and July, 1891; and two copies each of the following: January, 1886; Oct., 1886; Oct., 1887; July, 1888; January, 1889; January, 1890. My own contributions in them only are required; otherwise the copies need not be perfect. I have in exchange for them two vols. (zoology) Mex. Boundary Surveys (col. plates) or complete set of English reprints of "Osteology of Arctic Water-Birds, etc." (6 parts, 24 lith. plates); or other rare scientific reprints of any subject required. Address Dr. Shufeldt, Tacoma, D. C.

For Sale.—The first eleven volumes of Crooke's Quarterly Journal of Science, 7 vols. 1st series, 4 vols. 2nd series, beaut. fully bound, half morocco, as good as new, for \$30. John J. Jarney, 93 Indiana Place, Columbus, Ohio.

For Sale.—A very fine telescope, length extended, twenty-five inches, closed, seven inches. Power twenty-five times. Good as new. Cost \$25.00. Will sell for the best cash offer. B. S. Bowdish, Box 165, Phelps, N. Y.

For Sale or Exchange for last editions of Standard Works on Vegetable Anatomy or Physiology; Practical Zoology, Marshall & Hurst; Elements of Embryology, Foster & Balfour; Zoology, Macalister; Guide to the Study of Insects, Packard; Geological Studies and Shall We Teach Geology, Winchell. Also have duplicates of Experiment Station publications which would like to exchange for any not in my file. L. R. Jones, Burlington, Vt.

For exchange.—Skins of *Aegialites nivosus*, *Ereunetes occidentalis*, *Annodramus Ardingi*. *A. rostratus*, *Chamara fasciata henshawii*, etc., for native or foreign skins with full data. Send lists. A. W. Anthony, 2042 Albatross st., San Diego, California.

Wants.

WANTED.—Books or information on the microscopical determination of blood and hair. Also reports of cases where hair has played an important part in the identification of an individual. Address Maurice Reiker, 206 N. First Ave., Marshalltown, Iowa.

A GEOLOGIST thoroughly conversant with the geology of the Southern States desires an engagement. Has complete knowledge of the economic geology of Iron, Coal, Lignite, as well as Clay and Kaolin. Five years' experience with Geological Surveys. Address K., 509 West Sixth Street, Austin, Texas.

WANTED.—Tuckerman's Geneva Lichenum and Carpenter on the Microscope, Wiley's Introduction to the Study of Lichens. State price and other particulars. Richard Lees, Brampton, Ont.

WANTED.—Icones Muscorum by W. D. Sullivan, with or without Supplement, but both preferred. Address, stating price and condition of books, Dr. G. N. Best, Rosemont, N. J.

WANTED.—A copy of Mascart & Joubert's Lessons in Electricity and Magnetism, Vol. I. Address R. W. Clawson, Vanderbilt University, Nashville, Tennessee.

CHEMIST.—Graduate of a polytechnical school, and studied photographic chemistry in Germany and Austria. Situation teaching or in analytical or experimental laboratory. M. B. Punnett, Rochester, N. Y.