SCIENTIFIC BOOKS

A Key for the Determination of Rock-forming Minerals in Thin Sections. By Albert Johannsen. New York, John Wiley & Sons. 1908.

This key has been prepared, as the author states, for the reason that tables for the optical determination of minerals in thin sections have heretofore been made of secondary importance in text-books. Most of the books on this subject, while admirable in their way, are of more use to trained mineralogists than to beginners, this being due principally to the absence of "classification."

The book is divided into four parts: Part I. treats of introductory optics, measurements to be made with the microscope and the methods of recognizing the common optical characters of minerals. Part II. takes up the general discussion of the relations between the different members of the common groups of minerals. Diagrams are here given to assist in the determination of the species in the pyroxene, amphibole and feldspar groups. The part treating of the feldspars is particularly elaborate, giving fourteen methods of investigation. Part III. (415 pages) gives an explanation of the tables and contains a very elaborate scheme for determination, based on a systematic identification of the fundamental optical characters of the minerals in question, the minerals with similar optical characters being grouped in the same part of the scheme. Following the description of each mineral are given the distinctions between it and other similar minerals. Part IV. contains tables of mean indices of refraction, maximum birefringences, specific gravities, and also lists of minerals by crystalline system and "habit." A summary is appended of the optical characters of the minerals in alphabetical arrangement, which is very convenient, as it does away with the necessity of remembering the author's special arrangement, a universal fault to be found with other tables.

This book represents a very elaborate and painstaking collation of the important optical and crystalline characters of some one hundred and sixty-four rock-forming minerals, and, for the first time in the literature of the subject, the minerals have been arranged in a way for systematic optical determination. A further advantage lies in the fact that these optical and crystalline characters are always recorded in the same order and that paragraphing is freely used. The author has made the introductory discussions on optics and determination of optical characters as simple as possible, but has given detailed footnotes referring to more complete theoretical discussions of the underlying principles. Standard authorities have been consulted in the preparation of the general data, but the tables might have proved more useful had authorities been cited.

The scope of the work along optical lines is similar to that covered by Penfield and Brush in their "Tables for Blowpipe Determination of Minerals."

The scheme is sufficiently elastic to provide for mistakes likely to be made in the determination of some of the optical characters, as for example, extinction angles. Minerals with small extinction angles (under 5°) are found in two places of the scheme, both with minerals with inclined extinction and with those with parallel extinction. The micro-photographic cuts of interference figures are very good and many of the tests are explained with the aid of detailed diagrams, so that they may be easily and quickly made. A good color chart of the interference colors (after Lévy and Lacroix) is appended.

The value of the book might have been increased by a more detailed description of the types of petrographical microscopes and their common adjustments. Also the suggested indenting of the pages of the text is a matter of much trouble and an arrangement providing for this being done by the printer would certainly prove of great advantage in subsequent editions.

L. McI. L.

Southern Agriculture. By F. S. Earle. Pp. vi + 297. Containing 9 half-tone plates, many text cuts, and full index. New York, The Macmillan Co. 1908.

This work has many points of merit to commend it to the schools of the south and will no doubt be widely used as a text-book. It is divided into two parts, the first dealing with general considerations, such as climate, soil, soil management, soil improvement, the growth of plants, insects and diseases, and closes with a chapter on farm policy and management. The second part treats of the chief southern agricultural crops, including grasses and forage crops, fiber crops, tobacco, coffee, fruits, nut crops and forestry, and closes with a short chapter on domestic animals.

In the chapter on management of the soil, valuable suggestions are given on the use of farm implements, a part of agriculture so often neglected by writers. A little farther on, soil improvement is well treated and the relation of leguminous crops to same, with recommendations of certain leguminous crops for certain kinds of soil. The student is shown the relation of the plant to the soil, and the functions of the different parts of plants. The chapter on spraying and sprays, containing formulæ for different sprays, is well arranged and almost indispensable, inasmuch as crop enemies such as insects and fungi are so rapidly increasing in the south where heat and moisture are so conducive to their welfare.

In treating of individual crops in the second part of the book, the method is to be commended. First the author deals with the crop itself, and then as far as consistent with the nature of the plant, takes up a detailed study in each individual crop, of soil and climate, manuring, methods of planting and cultivating, and harvesting. This uniformity of method gives the pupil the benefit of comparing one crop with another on any of these points suggested.

Just what is meant by southern agriculture is not suggested by the author, but from the numerous references to the tropics and to tropical agriculture, it would seem that they are included in the title of the book. Possibly it would have been better to have gone a little further into the general and specific methods of tropical agriculture, and have given the book the title "Southern and Tropical Agriculture."

There seems to be very little excuse for devoting twenty-four pages to sugar cane and only sixteen to cotton, when the author states that cotton is our "greatest commercial crop," also, only twelve to corn, "the most important crop." A little more space should have been devoted to the best methods of improving cotton and corn, if not any less to sugar cane, especially after the above statements. The space devoted to an explanation of the poor methods of cotton planting on pages 175 and 176 could have been better used by giving better methods and emphasizing the necessity for level cultivation of cotton. It is a better paying business, for instance, to lay off new rows for your cotton than to follow cotton after cotton, as suggested in the text, notwithstanding the fact that its danger is hinted at on the same page.

There is no chapter devoted to the dairy and live-stock industry, though the importance of it is suggested in three places in the book. Stock feed can be raised very cheaply in the south and the cost of keeping stock is reduced to the minimum. No costly shelters are required, and it is possible to arrange your pastures so that your stock can graze ten or eleven months in the year. Besides, at present we ship from the south millions of dollars' worth of cotton-seed meal annually, to be used for stock feed in other parts of the world, instead of using it as we should, first through live stock to increase the beef and butter production of the south, and secondly in the form of barnyard manure to fertilize the land with. It is believed that the book would have been worth more to the schools of the south, if a good, lengthy chapter on the live-stock industry had been included.

In conclusion, it seems that the author is more at home in his studies of tropical agriculture, and though he has done excellent work, many parts of the book read as if the information given were not first hand. For instance, there is a freshness and an air of confidence in those parts that treat of diseases and remedies, and the botanical features of special crops that are conspicuously lacking

in the parts devoted to manuring and cultivating.

R. J. H. DeLoach

Bermuda in Periodical Literature, with occasional References to other Works. A Bibliography by George Watson Cole. Pp. ix + 275. Printed for the Author. 1907.

This volume contains 248 pages of references and 24 pages of index; the references are arranged alphabetically by publications, the index by subject and author, thus providing easy access to the contents. Each title is followed by a brief note which gives the characteristic features of the article, and these notes constitute a feature quite as valuable as the references themselves.

On the last page is a list of references to libraries in which a copy of the work cited was found. By the choice of fonts and skillful use of insets the various items of a citation are clearly differentiated to the eye, and the page is made attractive. The range of periodicals cited is very wide, and they cover not only newspapers and magazines, but proceedings of learned societies. The range of subjects is unrestricted, and taken together, they comprise nearly all that has appeared concerning history, description and natural history for the last fifty years. The last division has been especially well done, for it became apparent to Mr. Cole, soon after beginning his compilation, that Bermuda has been a favorite field for the geologist, the botanist and the zoologist. In the preface he says:

> Bearing this in mind, a special effort has been made to render the record of their labors as complete as possible. In order to do this, references are made to some works which are not periodicals, mostly, however, by authors who have also made contributions to periodical literature concerning the flora and fauna of those islands.

The result of this special effort has been to provide in one volume a reference to nearly every addition made to the flora and fauna since (and including) the *Challenger* expedition. The value of such a gathering to the botanist and the zoologist can not be overestimated, and this compilation, moreover, has proved to be exact and accurate at every point tested by the reviewer. Some idea of the manner of treatment may be gathered from the fact that nearly fourteen pages are required for the direct excerpts from the *Challenger* report, to say nothing of the entries of articles appearing elsewhere on the *Challenger* material. The references on birds go back to 1849 and come down to 1904; those on flora extend from 1700 to 1906; those on geology from 1833 to 1906. Moreover, the index takes account of the changes in nomenclature (*e. g.,* "Leptocardians, Goode (1877), 19. *See also* Asymmetron"), so that the difficulties due to this unfortunate obstacle are minimized.

While natural history is amply represented, the other subjects are not neglected. Twenty-four pages are given to citations from the New York City daily papers and seven pages to those from the London *Times*. The total number of citations is 1,382.

Taken as a whole, the work is a masterpiece of bibliography. To take up the chronicles of a somewhat remote island and set them down in order in these days of wide-spread publication seems a task almost impossible to perform in a creditable manner, and a thankless task when done. Mr. Cole's work is excellently well done, and he will earn the hearty thanks of every botanist and zoologist who has occasion to use the volume. In view of the forthcoming tercentennial celebration to be held in Bermuda next year, the colony may well thank Mr. Cole for so handy a volume of reference.

C. L. Bristol

SCIENTIFIC JOURNALS AND ARTICLES

Terrestrial Magnetism and Electricity for December contains the following articles: "Solar Magnetism," by W. J. Humphreys; "Note on the Magnetic Effect of Winds," by W. J. Humphreys; "Solar Magnetic Fields and the Cause of Terrestrial Magnetism," by W. Sutherland; "Note on Sutherland's Article," by G. E. Hale; "On the Probable Existence of a Magnetic Field in Sun-spots," by G. E. Hale; "On the Distribution of Magnetism over the Earth's Surface, II.," by P. T. Passalskij, translated by Paul Wernicky;