

and demonstrated the determination of pleochroism and index of refraction, using the projecting apparatus and a Leitz model petrographic microscope.

At the conclusion of his address a vote of thanks was tendered to Dr. Larsen for his highly valuable address. The meeting adjourned at 10 P. M.

HERBERT P. WHITLOCK, *Recording Secretary.*

## BOOK REVIEW

A MANUAL OF DETERMINATIVE MINERALOGY, WITH TABLES FOR THE DETERMINATION OF MINERALS BY MEANS OF: I. THEIR PHYSICAL CHARACTERS; II. BLOWPIPE AND CHEMICAL PROPERTIES. J. VOLNEY LEWIS. 298 pages. John Wiley & Sons, Inc., New York, 1921.

While this is the third edition of a book by the same leading title, it is essentially a new work, for the former blowpipe tables have been, as stated in the preface, thoroly revised and recast, and new tables for identification by physical properties alone have been added. By way of introduction a list of the physical properties of minerals is given; it covers, however, only eleven pages, and could have been considerably enlarged to advantage. The data are up to date except that the imperfections which we now know to exist in the Mohs hardness scale (in which the numbers 4 and 5 are identical in hardness, and 8 not far different from 7), are not warned against.

The physical tables, which fill more pages than the blowpipe ones, and cover nearly 300 minerals, are unusually skilfully worked out. Luster, which is well known to be a stumbling block to students in many tables, is eliminated as the basis for the first subdivision, and streak which is decidedly easier for a beginner to ascertain definitely, is substituted. No use appears to be made, however, of the "rubbed streak"—i. e., the result of rubbing the ordinary streak with a bit of clean streak plate—altho it is very helpful in distinguishing such closely similar minerals as stibnite and bismuthinite, manganite and pyrolusite, etc. The second subdivision is based on color, and the third, where necessary, on cleavage. In the smallest divisions the minerals are arranged in the order of increasing hardness. Under each mineral, synonyms, composition, properties and occurrences are listed. No attempt is made to feature special properties as especially characteristic, altho this might be helpful in confirming certain minerals. For example, when the table brings together chondrodite and cassiterite, the mere lifting of the specimen would be enough to tell which was which; when fluorite and chabazite, gentle heating in a dark corner would distinguish them; vivianite and gypsum, the rubbing for a short time in a mortar would lead the former to turn blue. The least that might be done would be to in some way emphasize a few of the most characteristic of the properties listed, so as to make wading thru the whole list unnecessary. On the whole, however, the physical tables are well arranged, and should prove very useful in practical identification.

The part of the book devoted to the blowpipe methods is an improvement over the previous editions, excellent tho these were. The introductory descriptions of methods and tests are elaborate; and their completeness is evidenced by the fact that not only is the flame color of manganese chloride—omitted from most min-

eralogies—included, but even its modifications as seen thru the different strips of the Merwin screen. The actual tables, including some 350 minerals, are arranged in tabular fashion after the plan made familiar in this country by Brush and Penfield. It seems a little inconsistent to use luster for the first subdivision here when it was definitely excluded in the other set of tables, altho of course the need of avoiding the heating of metallic minerals in contact with platinum makes this here less easy to change. Perhaps the freer use of modern alloys like nichrome for blowpipe apparatus—which by the way does not appear to be mentioned—will ultimately make even this time honored basis of subdivision disappear from blowpipe tables. Abbreviations are rather freely used, but many of them seem rather awkward, as Cp. for compare (which is too much like a chemist's abbreviation for comparatively poor; cols. for colorless; gryh. for grayish and other colors corresponding; per. for perfect; somet, for sometimes; st. for streak (str. would be better); and us. for usually. Judging from the rather large amount of blank space in the various columns, the writing out of many of the abbreviated words would not increase the volume materially. After all, however, the purpose of an identification table is to identify, and it would be difficult to improve upon these tables for that end. Some useful lists of minerals arranged according to crystallization and hardness are also given; it seems a pity that all known minerals could not have been included.

Lewis' Determinative Mineralogy is well printed, with extraordinarily few compositor's errors, and no obvious scientific ones. It should be valuable alike as a college text-book and for use by anyone desiring to become familiar with or to identify the more important minerals.

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