given below, obtained by measurement of a crystal slightly more than one millimeter in diameter, shows what seems to be a new form for the species. This is represented by two fairly prominent faces, which gave, however, only fair signals on the goniometer. It is indicated by an * in the table.

TABLE 2. ANGLES OF APATITE FROM SOUTH FOSTER

Letter	SYMBOL		ANGLES			
			Measured		Calculated	
	Gdt.	Brav.	ϕ	ρ	ϕ	ρ
c	0	0011		0°00′		0°00′
a	∞ 0	$10\bar{1}0$	0° 00′	90 07	0° 00′	90 00
r	$\frac{1}{2}0$	$10\bar{1}2$	"	23 09	"	22 57
x	10	$10\bar{1}1$	"	40 39	"	40 16
y	20	$20\bar{2}1$	"	59 34	"	59 27
z	30	$30\bar{3}1$	"	67 26	"	68 31
s	1	$11\bar{2}1$	30 00	55 58	30 00	55 43
*	6	$6.6.\bar{12}.1$	"	83 49	"	83 31

BOOK REVIEWS

ELEMENTE DER PHYSIKALISCHEN UND CHEMISCHEN KRYSTALLOGRAPHIE, P. GROTH. 8-vo. x+363 pages, with 962 text figures, 4 plates, and 25 stereoscopic photographs. R. Oldenbourg, Munich, 1921.

When Professor Groth first delivered a course of lectures at the School of Mines in Berlin in 1870 in which he discussed crystallography from the standpoint of the physical relationships, he departed materially from the then conventional method of presenting the subject. These lectures were subsequently repeated at the University of Strassburg and eventually led to the publication of his "Physikalische Krystallographie" in 1872, which has since passed thru several editions; the last of them, the fourth, appeared in 1905. Also, as is well known, he has just completed his "Chemische Krystallographie," a monumental work of 5 volumes, which is a critical survey of our knowledge of crystallized substances. In fact, Professor Groth has devoted the major portion of his very active life to problems in chemical and physical crystallography and hence is exceptionally well equipped to present in a single volume the salient facts concerning the intimate relationships existing between the chemical constitution and the various physical properties of crystals. Accordingly the present text attempts to give the student of chemistry and physics a knowledge of the fundamentals of crystallography without burdening him with a mass of information about minerals, for usually crystallography is presented only in connection with mineralogy.

The book is divided into two parts: (a) Physical Crystallography, and (b) Chemical Crystallography. The first part is sub-divided into two sections designated as General and Special, respectively. There is also an Appendix which is

to serve as an introduction to the Determination of Crystals. Ninety-seven pages are devoted to the General section on Crystallography. This section includes an introduction and chapters dealing with the physical properties, structure, and geometrical relationships of crystals. The style follows very closely that of Professor Groth's Physikalische Krystallographie. The illustrations have apparently been also taken from that text. Less than four pages are devoted to the discussion of the determination of crystal structure by means of X-rays. The Special section contains 170 pages and is a systematic discussion of the 32 classes of symmetry, with numerous examples of substances belonging to the various classes. This material has been carefully selected from that given in the author's Chemische Krystallographie.

The section on Chemical Crystallography occupies 57 pages and includes the following chapters: Chemical and Crystallographic Symmetry, Crystal-chemical Relationship (Morphotropy, Isomorphism), and Polymorphism. This portion of the text should prove of the utmost interest to the student of chemistry. The appendix of 14 pages contains an introduction and short sections dealing with the microscope, refractometer, conoscope, and goniometer. The treatment of these instruments is very elementary. Unfortunately the two-circle goniometer is not discussed, due probably to the fact that practically all of our information concerning the crystallography of chemical substances is in terms of the one-circle method.

EDWARD H. KRAUS

ANLEITUNG ZUM BESTIMMEN DER MINERALIEN, FUCHS-BRAUNS. Seventh Edition, 223 pages, with 27 illustrations in the text. Alfred Toepelmann, Giessen, 1921.

This edition of these popular mineral tables follows very closely the others. Errors have been corrected, possible substitutes for platinum in blowpipe methods are discussed, and Naumann symbols are replaced by Miller indices.

The book consists of five parts. In part one, to which 23 pages are devoted, descriptions of important blowpipe reactions are given. Tables for the determination of minerals by blowpipe methods make up part two, consisting of 34 pages. Useful microchemical methods and tests are fully described in the next 41 pages, designated as part three. For the recognition of minerals by means of their physical properties, reinforced by simple blowpipe and other chemical tests, there are excellent tables in part four. These tables include 107 pages. In the 9 pages making up part 5 are found the values of the characterizing angles of some of the more common minerals.

The book is an excellent compendium of information relating to the determination of minerals by their physical and chemical properties. E. H. K.

MINERALOGISCHE TABELLEN, P. GROTH AND K. MIELEITNER. 176 pages. R. Oldenbourg, Munich, 1921.

This is essentially a revision in a somewhat condensed form of the senior author's "*Tabellarische Uebersicht der Mineralien, nach ihren kristallographisch-chemischen Beziehungen geordnet,*" the last edition of which appeared in 1898. There has, however, been added a second part containing tables for the determination of the more important minerals by means of their external physical properties.

The fundamental chemical principles which are followed in making this very logical classification of minerals are briefly discussed in an introduction of 11 pages.

Those minerals now commonly recognized as independent species are then arranged in isomorphous series, as far as possible, under the following general headings: elements (3 pages), sulphides and sulpho-salts (15 pages), oxygen compounds (6 pages), haloids (5 pages), nitrates, carbonates, and related minerals (7 pages), sulphates and related compounds (11 pages), borates, aluminates, and so forth (4 pages), phosphates and allied compounds (18 pages), silicates, titanates, and so forth (46 pages), and organic compounds (2 pages). There is also a list, extending over 5 pages, of minerals, which are now interpreted as mechanical mixtures, or which have not been sufficiently investigated to permit them to be accurately classified. Each series of minerals is accompanied by a concise, critical discussion of the relationship of the minerals in the series, and in addition to the chemical data, the elements of crystallization are given, whenever available.

This classification of minerals deserves to be more widely known in America, for it has many admirable features to commend it, among which is the passing progressively from the simplest, the elements, to the most complex minerals, the silicates and organic compounds.

In the determinative tables the more common minerals are grouped according to hardness and streak. Other properties made use of are color, luster, crystallization, cleavage, structure, occurrence, and associates.

E. H. K.

PROCEEDINGS OF SOCIETIES

NEW YORK MINERALOGICAL CLUB

November 30, 1921

The regular monthly meeting of the New York Mineralogical Club was held in the American Museum of Natural History on the evening of Wednesday, November 30, at 8:15 P.M. There were present 22 members. During the temporary absence of the President, the Vice President presided.

The matter of identification of the Club members at field meetings was introduced by Mr. Tansley who moved that the members on such occasions provide themselves with a white ribbon to be worn conspicuously and that the Secretary remind the members of this by inserting a note in the field meeting announcements. The Secretary called attention to the advisability of printing a list of the members of the Club for the convenience of responsible parties requiring such information. A motion to print such a list was carried. The President then introduced the speaker of the evening, Professor Charles Palache of Harvard University who read a paper on "*The minerals of Franklin Furnace.*"

The speaker, who had begun the study of this deposit in 1896, called attention to the results of his investigations as published in the Franklin Furnace Folio in 1908. Reading from a manuscript soon to be printed, he took up briefly the history of the deposits, mentioning the description of zincite by Bruce in 1810, and tracing the history back to the Dutch period in 1640, and to the shipping of ore by Lord Sterling early in the 17th Century. He drew attention to the fact that McClure sent franklinite abroad for identification, and to the work of Dr. Fowler and his son in interesting geologists in the scientific possibilities of the deposits. He spoke of the scientific interest displayed by Mitchell, Torry and particularly Alger and of the first successful exploitation by the New Jersey Zinc Co. in 1850.