

It is often convenient to refer to classes with varying degrees of symmetry within a crystal system and for this purpose the terms holohedral, merohedral, etc., are usually employed. Reasons are given for preferring the suffix-symmetric to the suffix-hedral, thus giving holosymmetric, merosymmetric, etc. These terms were introduced by Story-Maskelyne in 1875, but his nomenclature was unnecessarily complicated.

A simple set of names based upon merosymmetry is presented as a list supplementary to the class names based upon general forms. Since there are only six crystal systems, if we employ that term in the usual sense of a series of closely related classes with geometrical and physical properties in common, there are only six holosymmetric classes.

(7). *Zoned olivines and their petrogenetic significance.* By DR. S. I. TOMKIEFF.

The composition of zoned olivines as determined by measurements of the optic axial angle shows a relation between the olivines and the composition of the parent rocks. Within the olivines the variation is from a Mg-rich centre to an Fe-enriched margin.

(8). *The crystallography of sartorite.* By MR. F. A. BANNISTER, DR. A. PABST and MR. GEORGE VAUX.

The complex forms of this mineral like those of calaverite have in the past been indexed by various expedients not mutually consistent. Laue and rotation photographs reveal that sartorite is monoclinic, $\beta = 90^\circ$ with $a = 58.38$, $b = 7.79$, $c = 83.3 \text{ \AA}$, containing $240 \text{ PbAs}_2\text{S}_4$ and that it possesses a well-marked orthorhombic pseudo-cell with $a = 19.46$, $b = 7.78$, $c = 4.17 \text{ \AA}$. The abundant measurements made by previous crystallographers can be interpreted satisfactorily on the basis of our *x*-ray measurements.

NEWARK MINERALOGICAL SOCIETY

The 179th meeting of the Newark Mineralogical Society was held at their new meeting place, 468 Orange Street, Newark, N.J., on Sunday November 6th. Fifteen members and two guests were present.

The topic for discussion was "Unusual Specimens of the Rarer Minerals." The following crystals were exhibited: tellurium; thorite from Easton, Pa.; arsenopyrite from Stirling Hill, N.J.; carnotite ($1\frac{1}{2}$ in.); kainite ($1\frac{1}{2}$ in.); ellsworthite; samarskite and betafite. A crystal of witherite ($2\frac{1}{2}$ in.), showing pseudo-hexagonal development, from England, and parsonite and phosphuranylite from Bavaria, were also on exhibition.

At the close of the meeting the following officers were elected: President, Mr. R. P. Milburn; Vice-President, Mr. V. Giordano; Secretary, Mr. H. L. Thowless; Treasurer, Wm. H. Broadwell.

WM. H. BROADWELL, *Treasurer*

BOOK REVIEW

A DESCRIPTIVE PETROGRAPHY OF THE IGNEOUS ROCKS, VOLUME IV—THE FELDSPATHOID ROCKS AND THE PERIDOTITES AND PERKNITES. ALBERT JOHANNSEN. Pp. 524. The University of Chicago Press, Chicago, 1938, Price \$4.50.

This is the fourth and last volume of Johannsen's great work on descriptive petrography.

The first volume discusses the constituents and textures of igneous rocks and gives outlines of the many classifications that have been proposed, especially of the newer quantitative classifications, both those based on mineral and on chemical compositions. The final section outlines the author's own quantitative mineralogical classification. The very valuable appendices include a table on miscellaneous definitions, one on textural terms, and tables for the calculation of norms and modes.

The second volume describes the rocks that contain quartz. The third volume describes the intermediate rocks, those that contain feldspar but neither quartz nor feldspathoids; and the fourth volume describes the rocks with feldspathoids, and those that contain neither feldspar nor feldspathoids—the ultramafic rocks.

Johannsen's classification is quantitative, strictly mineralogical and follows, as far as possible, the older mineralogical classifications. It uses volume percentages and makes divisions at 5, 50, and 95 per cent, except for the anorthite content of the plagioclase, where the divisions are at 10, 50, and 90. The classification is plotted on triangles and a double tetrahedron. The four classes are based on the content of the leucocratic constituents. The four orders for rocks containing appreciable amounts of feldoids are based on the composition of the plagioclase. Johannsen includes rocks without plagioclase in the first order and includes the albite in perthite with the potash feldspar. For the rocks of class 4, the ultramafic rocks, he bases his four orders on the content of "ores." He divides orders of the first three classes into 26 families on the basis of the proportions of quartz or feldspathoids, K-feldspar, and plagioclase, and plots the results on a double triangle after calculating the leucocratic constituents to 100 per cent. They might be shown thus:

		Proportion of plagioclase in feldspar			
		0 to 5	5 to 50	50 to 95	95 to 100
Quartz	100 to 95	0			
	95 to 50	1	2	3	4
	50 to 5	5	6	7	8
	5 to 0	9	10	11	12
Foids	0 to 5	13	14	15	16
	5 to 50	17	18	19	20
	50 to 95	21	22	23	24
	95 to 100	25			

In class 4, twelve families are based on the proportions of olivine, biotite+amphibole, and pyroxene.

Johannsen divides rocks into three groups according to occurrences: plutonic, hypabyssal, and volcanic, and places some emphasis on the diaschistic rocks. In America, at least, the present tendency is to divide rocks according to texture and to place less emphasis on the diaschistic rocks, and even to question the validity of the conception of diaschistic rocks.

The text gives an outline of the origin and history of the many rock names that have been proposed and brief descriptions with quantitative modal content of minerals, where possible, and chemical analyses. They are arranged according to Johannsen's classification. This enables one quickly to find for comparison descriptions and names of rocks for which he has mineralogical data.

An interesting and valuable feature of the treatise is the large number of reproductions of photographs of petrographers, living and dead.

The four volumes should be much used by every working petrographer.

ESPER S. LARSEN