

face on those figures, and this was not done. In the second place it has not been proved that the merosymmetry observed, when contamination occurred, was actually due to an optically active constituent in the dust or other contaminating agent. Such experiments as were tried with optically active compounds were admittedly inconclusive, and the fact that the revolution of the etch-figures was clockwise in all cases, even when two optical isomers of a given compound were used, seems to the reviewer to indicate quite clearly that the production of gyroidally arranged etch-figures is a property characteristic of the crystal itself. All that Hettich does appear to have demonstrated is that a trace of organic matter in the etching solution leads to the development on the etch figures of an (hkl) form, which, for some reason as yet undetermined, has a clockwise gyroidal face-arrangement.

This review is written in the hope that someone may be encouraged to carry on further work on the alkali halides, and clear up the points still in question. Perhaps instead of etching crystal surfaces it would be more informing to grow crystals under conditions leading to the development of (hkl) faces, along lines such as those so well worked out by Walcott in this journal recently.<sup>3</sup> The lack of rotation of the plane of polarized light showed long ago that the alkali halides are structurally holosymmetric, and the reviewer quite agrees with the author's criticism of the theory of Johnsen and of Thirring, that the ions in the crystal are nevertheless themselves plagihedral. Etch figures bring out only surface, not internal, relationships. However, as has been stated elsewhere<sup>4</sup> the phenomena of amphisympmetry do make it appear that even though the ions in a crystal may be arranged with a high degree of symmetry, under certain conditions at the instant of solution or deposition a diminished symmetry, perhaps characterizing the atoms rather than the ions, can assert itself. Possibly Hettich's contaminating organic matter merely represses ionization at some critical moment in the change from liquid to solid phase (or the reverse); or, it may slow up, differentially, the rate of change of the two opposing ions. However, theoretical speculation is of little value until the necessary experimental data are available. A crystallographic problem of considerable interest and probable importance awaits further investigation.

E. T. W.

## NEW MINERAL NAMES

### Heterobrochantite

H. BUTTGENBACH: L'Hétérobrochantite, variété d'antlerite (Stelznérite). *Bull. Ann. Soc. Geol. Belg.*, 49, pp. 3-11 (1926).

NAME: Named in allusion to its *heteropolar* (*hemimorphic*) development and its resemblance to *brochantite*.

CHEMICAL PROPERTIES: A basic sulfate of copper. Formula: Like that of antlerite,  $3\text{CuO} \cdot \text{SO}_3 \cdot \text{H}_2\text{O}$ . Analysis: CuO 68.03,  $\text{SO}_3$  22.33,  $\text{H}_2\text{O}$  10.53, Insol. 0.01; Sum 100.93.

CRYSTALLOGRAPHIC PROPERTIES: Orthorhombic. Habit flat plates. Cleavage (100) good, also (010). Under the microscope the crystals appear to be hemimorphic, one set of faces making an angle of  $45^\circ$  with the vertical, the opposite set  $54^\circ$ .

<sup>3</sup> *Am. Mineral.*, 11, 221-239, 259-278 (1926).

<sup>4</sup> *Am. J. Sci.*, 4, 241-242 (1922); also *Am. Mineral.*, 9, 53-54 (1924).

PHYSICAL AND OPTICAL PROPERTIES: Color green, colorless when very thin, not pleochroic. Biaxial positive. Plane of the optic axes parallel to (100), acute bisectrix parallel to (100).  $\alpha=1.743$ ,  $\gamma=1.776$ . Birefringence 0.033 (measured).

OCCURRENCE: As a green microcrystalline mass from Chile.

DISCUSSION: While the chemical composition of the heterobrochantite and of antlerite are the same the author believes there are sufficient optical differences to distinguish them; the indices are somewhat different, the plane of the optic axes in heterobrochantite is parallel to (100), in antlerite parallel to (001), the acute bisectrix in heterobrochantite is normal to (001), in antlerite it is normal to (010).

W. F. FOSHAG

### Kipushite

H. BUTTGENBACH: Description d'un Mineral du Katanga. (Description of a mineral from Katanga). *Acad. Roy. Belg. Bull. Classe Sciences*, pp. 905-913 (1926).

NAME: From the locality *Kipushi*, Katanga.

CHEMICAL PROPERTIES: A hydrous phosphate of zinc and copper. Formula:  $6(\text{Cu}, \text{Zn})\text{O} \cdot \text{P}_2\text{O}_5 \cdot 6\text{H}_2\text{O}$ . Analysis (by M. Bolsius) CuO 35.99, ZnO 28.94,  $\text{P}_2\text{O}_5$  19.90,  $\text{H}_2\text{O}$  14.31,  $\text{SiO}_2$  0.65. Sum 99.79. Soluble in acids.

CRYSTALLOGRAPHIC PROPERTIES: Monoclinic.  $a:b:c=0.9540:1:0.7397$ .  $\beta=77^\circ 6\frac{1}{2}'$ . Forms (110), (111), ( $\bar{1}11$ ), (421). Habit pyramidal. Cleavage ( $\bar{1}11$ ).

PHYSICAL AND OPTICAL PROPERTIES: Color deep blue, streak green. Luster vitreous. Not pleochroic. Biaxial, positive. Indices of refraction between 1.63 and 1.74. Birefringence .025. Plane of the optic axes parallel to (010).  $Bx_a \wedge c=96^\circ 30'$ .

OCCURRENCE: Found in the Prince Leopold mine at Kipushi, Katanga, Belgian Congo, in crystals averaging 3-5 mm. in size with aurichalcite on calamine.

DISCUSSION: Kipushite is the same as the unknown mineral described by Mennell and Spencer (*Mineralog. Mag.*, XIX, No. 90, pp. 69-72, 1920) and belongs to an isomorphous series with veszelyite and barthite, kipushite being the phosphate end member, barthite the arsenate end member and veszelyite the intermediate member.

W.F.F.

### Ternovskite

I. POLOVINSKINA: *Mem. Soc. Russ. de Min.* 2nd Ser., 54, pp. 142-234 (1925).

NAME: From the locality, *Ternovsky* Mine, Russia.

CHEMICAL PROPERTIES: An alkalic hornblende. Analysis: (by Mrs. E. A. Sverginisky)  $\text{SiO}_2$  52.72,  $\text{TiO}_2$  0.31,  $\text{Al}_2\text{O}_3$  3.65,  $\text{Fe}_2\text{O}_3$  15.46, FeO 8.16, MgO 9.16, CaO 2.10,  $\text{Na}_2\text{O}$  5.91,  $\text{K}_2\text{O}$  0.68, ign. 1.85.

PHYSICAL AND OPTICAL PROPERTIES: Biaxial Plane of the optic axes parallel to (010). Extinction angle  $Z \wedge (001)=27^\circ-35^\circ$ .  $\alpha=1.655$ ,  $\beta=1.664$ ,  $\gamma=1.668$ . Birefringence .013. Dispersion  $\rho < \nu$ . Pleochroism strong. X=pale bluish green, Y=pale violet, Z=pale yellow.

OCCURRENCE: Found in slate at the quarry of the Ternovsky Mine (iron) Krivoy-Rog, Kherson, Russia.

DISCUSSION: Related to rhodusite, abriachanite, crocidolite and glaucophane. The rocks of the Krivoy-Rog iron ore district are described by E. V. Tarasenko: *Acto Universitates Joronegiensis, Voronezh.* 1, 265-289, 1925.

W.F.F.