ART. XL. — *A New Habit for Chalcopyrite*; by R. W. RICHARDS.

A SPECIMEN of chalcopyrite collected in Somerville, Massachusetts, by Prof. A. E. Dolbear, of Tufts College, some years ago, shows apparently a new and simple habit for the species. The specimen was found in a vein of rusty quartz in the quarry between Broadway and Holland Streets, near Clarendon Hill. The rock of the quarry is the so-called Cambridge or Somerville Slate, referred by some geologists to the Carboniferous, by others to the Lower Cambrian. This rock is a clay-slate cut by many diabase dikes, which in turn are cut by numerous veins carrying a great variety of minerals, among which quartz, calcite, albite, prehnite, babingtonite, erythrite, chlorite and oxides of titanium, recently discovered by Prof. Charles Palache, of Harvard University, may be mentioned.

The crystallization of chalcopyrite is tetragonal, and a sphenoidal habit usually predominates. Prof. S. L. Penfield, in his paper in this Journal on crystals from Chester Co., Pa. (vol. xl, 207, 1890), figured specimens showing prismatic and pyramidal planes, and others showing sphenoid and scalenohedral faces, which he suggests may represent a prism and a second order pyramid distorted by oscillatory combination with the positive sphenoid. The indices he assumes for the distorted forms agree with the forms found on the crystal described in this note.

The Somerville specimen is shown in the cut and possesses only two forms, a prism *m* and a second-order pyramid *e*. These have the indices 110 and 101, respectively, and present the identical faces figured by Prof. Penfield, in a twin crystal (l. c. fig. 8, p. 210). The rough character of the Somerville crystal permitted only contact measurements and the best readings were selected by choice. The angles giving the most satisfactory set of readings are those around the coign *m* to *e*, *e* to *e*, and *e* to *m*. These angles are nearly equal and were found by measurement to be about 60°. This satisfies the relation that should obtain between the planes of the prism and those of the second-order pyramid,

$$\begin{array}{ll} e \text{ to } e, & 59^{\circ} 30'5'' \\ e \text{ to } m, & 63^{\circ} 46'1'' \end{array}$$

In Hintze's *Handbuch der Mineralogie*, sixteen cases are noted of the occurrence of the form *e*, and only seven of *m*. With the exception of one or two cases, either one or the other or both forms are subordinate. The Somerville crystal seems novel in showing these forms predominant and, perhaps, excepting the sphenoid, represents the simplest form of the crystallized mineral.

It is interesting to note that this form differs very slightly from the isometric dodecahedron. This similarity is accounted for by the axial ratio of the mineral, 1 : 0.98525. The resemblance of the crystal to the dodecahedron is well brought out by comparing it with a model of the same. In the drawing and in the crystal itself, the illusion is destroyed by the downward extension of the prism plane.

The crystal is unusually large for the species, having an average diameter of four centimeters. The largest of the Chester County crystals had diameters of a centimeter. Lacroix mentions large crystals from Oued Allelah of Algeria, Africa, having diameters of eight millimeters. The rather indistinct sphenoids from Ellenville, N. Y., have about the same dimensions as the Somerville crystal.

Credit is due to Prof. Palache for assistance in the examination of the specimen and suggestions in regard to its importance.

Tufts College, Massachusetts, 1904.