FRIENDS OF MINERALOGY

Pennsylvania Chapter

NEWSLETTER

VOL. 16, No. 2, Summer, 1988 Page 1

MEMBERSHIP INFORMATION

DUES: Please check your address label. If you have not yet sent in your 1988 dues ($7.00 or $5.00 for members over 62), send a check or money order made out to "F.M., Pa. Chapter," to Vince and Marge Matula, F.M./Pa. Membership Chairmen, 1032 Honeysuckle Drive, Walnutport, PA 18088. Your cooperation is appreciated.

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NEW ADDRESS: Dr. Steven E. Chamberlain, 113 Brooklea Dr., Syracuse, NY 13207

EDITOR: Juliet C. Reed, 336 Rockland Rd., Wayne, PA 19087.

NOTES AND NEWS

French Creek Mine Dumps Close

Peter Chonka, longtime owner and host at the French Creek Iron Mine Dumps in St. Peter's, Chester County, has sold his property. Since his liability insurance is no long in force after November 14, collectors will, at least for the time being, no longer be able to collect at this time-honored locality. The Chester County Rockhounds and the Delaware Mineralogical Society cooperated to provide a recent bull-dozing, so that collecting should be good up to the deadline.

French Creek Iron Mine Specimens on View

A case of fine mine-run French Creek specimens is among fifteen hundred museum-quality specimens from the old George Vaux, Jr. and Rand-College Collections on view on the first and second floors of the Geology Department, Science Center, Bryn Mawr College, Bryn Mawr, Pa. Visitors are welcome to walk in, on week-days during the academic year, or make an appointment for a tour with the Assoc. Curator, Juliet C. Reed (home phone (215)-688-6180). See the Geology Secretary on the second floor or Mrs. Reed in Room 157 for an essential parking permit.

A NEW STUDY OF THE TURQUOISE GROUP

Allen Heyl kindly sent in a copy of an abstract on "Reassessment of the Turquoise Group: Redefinition of Planerite $(\square)Al_6(PO_4)_2(PO_3OH)_2(OH)_8 \cdot 4H_2O$ and Aheylite, $FeAl_6(PO_4)_4(OH)_8 \cdot 4H_2O$, A New Member of the Group," by Eugene E. Foord and Joseph E. Taggart, U.S.G.S., Denver (Abstracts with Program (1986), International Mineralogical Association Meeting). Gene Foord, through Allen Heyl, gave permission to quote from the abstract.

Foord and Taggart addressed the problem of redefining a member of the phosphate turquoise group known since 1862 (planerite) and defining a new member of the group (aheylite), named for Allen Heyl.

"Currently, turquoise (Cu-Al), faustite(Zn-Al), chalcosiderite (Cu-Fe) and coeruleolactite (Ca-Al) are accepted as valid species members ofthe turquoise group. Planerite (Al) and aheylite (Fe-Al) have been accepted by the IMA and are discussed here...."

Analyses of samples from the type locality of planerite, the Gumeshevks copper mines of the Ural Mountains, U.S.S.R., showed the the mineral is "characterized by having the A site vacant or nearly so...." and that what little iron is present is ferric rather than ferrous, as originally thought. Extensive research further defined the planerite to the satisfaction of the I.M.A.

"Coeruleolactite from General Trimble's mine, East Whiteland Township, Chester County, Penna., is a planerite-turquoise with the A site nearly half-filled with Cu and minor Zn. Individual 4-10μ-sized euhedral crystals are composed of botryoidal encrustations associated and mixed with L-type variscite, wavellite, rare matulaite, gibbsite, cacoxenite, goethite and limonite....." Cell data was established by Foord and Taggart for the General Trimble Mine mineral, described earlier by Foord, Heyl, and Taggart in the F.M./Pa. Newsletter in September, 1984 (Vol 12, No. 3, p. 4-5).

"Aheylite is defined as the ferrous-iron dominant (A site) member of the turquoise group. The mineral occurs associated with cassiterite, pyrite, quartz, sphalerite, variscite type L, variscite type M, wavellite, and vivianite in ore samples from the Mira Flores vein system, District of Huanuni, Dept. of Oruro, Bolivia. Individual spheres of aheylite as are as much as 2 mm across and are very pale blue green to light blue green The botryoidal spheres are made up of euhedral radiating and concentric aggregates of crystals as much as several microns in maximum dimension....."

"Compilation of available superior analyses for members of the turquoise group indicate the existence of continuous solid-solution series between the various end-members....." Foord and Taggart go on to say that planerite and cation-deficient turquoise are more common than currently realized.

Allen Heyl (p.c, 1988) commented on the possibility of finding aheylite among the pale "turquoises" found in Pennsylvania, at Hellertown and at the General Trimble Mine.

EDITOR'S NOTE

The editor regrets that the illness of her mother, involving several trips to Orlando, delayed the publication of this issue.

GEORGE L. ENGLISH,
EDWIN C. ATKINSON, } Philadelphia.

WILLIAM NIVEN,
New York.

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FIFTEENTH EDITION.
JUNE, 1890.

Pyrite Crystals from French Creek, Pa.

By Prof. S. L. Penfield (*Amer. Jour. Science*, March, '89).

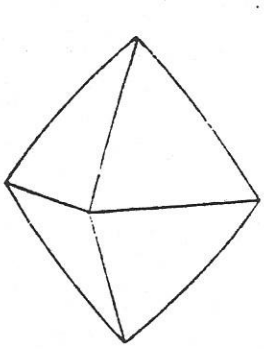
Ordinarily simple octahedrons and cubes of pyrite occur at French Creek, Pa., while occasionally rarer combinations are met with, as the cube with π (420), $\frac{1}{2}$ (4–2). The crystals are bright and have a good lustre, but are usually covered with vicinal faces and are sometimes quite distorted by them. The crystals which are to be especially described in the present article, are five which are in the collection of Mr. C. S. Bement of Philadelphia, and two in the collection of Prof. Geo. J. Brush of New Haven. . . . They are in all cases isolated crystals, built out in all directions and showing no attachment. I have been unable to obtain any exact information as to their mode of occurrence, and can only state that they are very rare and are from the iron mines of French Creek.

The special peculiarity of these crystals is that they are abnormally developed, *i.e.*, lengthened out, in the direction of one of the crystallographic axes. If we take this direction as the vertical, the crystals will appear either as steep tetragonal or orthorhombic pyramids. In all cases the pyramidal faces are curved toward the apex and as a result of this the pole edges, running from the lateral to the vertical axes, are curved, while the middle edges, running between the lateral axes, are perfectly straight. Owing to this curving, the angles between the faces cannot be measured with the reflecting goniometer, and admit of only approximate measurement with the contact goniometer. The crystals have a remarkably perfect geometrical development, that is, similar faces are developed to almost exactly the same size and extent.

The first three crystals to be described, which are in the Bement collection, appear as tetragonal pyramids. By measurement of the interfacial angles over and near to the middle edges, the faces were found to be steep enough to cut the vertical axes at 1.25, 1.50 and 1.80 respectively, but owing to the curving the distances at which the faces actually intercept the vertical axes are less. Figures 25, 26, and 27 represent the three crystals, drawn with the same length of the lateral axes, and with the pole edges straight for a short distance from the lateral axes, and steep enough to cut the vertical axes at 1.25, 1.50 and 1.80, respectively, but curved toward the top so that the vertical axes are really cut at 1.16, 1.25 and 1.50 respectively, according to actual measurement of the diameters of the crystals. The crystals are of good size, and measure in the direction of the vertical axes respectively 22, 22 and 33 mm.

The remaining crystals are perhaps more interesting, owing to the occurrence of pyritohedral or pentagonal dodecahedral faces, which in all of the crystals occur only at the extremities of the lateral axes. The

faces are rough, but approximate measurements with the contact goniometer determine the crystals to be the ordinary pyrite form *e*, π (210), $\frac{1}{2}$ (*i*—2). The pyramid is in all cases the curved $\frac{3}{2}$ form, *r*, like Fig. 26.



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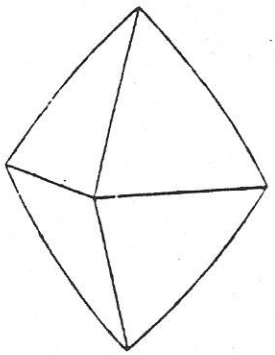

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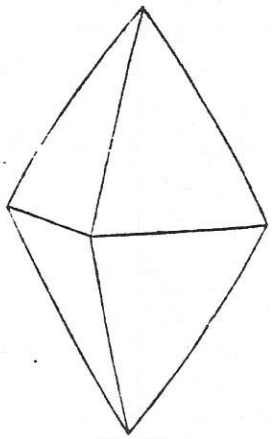

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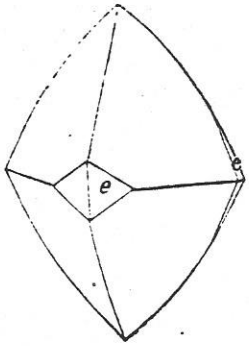
The pyramid faces are always striated near to and about the front pyritohedral faces, the striæ being a little steeper than the combination edge between *e* and *r*, and having about the direction of the combination edge π (421), $\frac{1}{2}$ (4—2) and *r*. The pyritohedral faces have very different shapes at the extremities of the two lateral axes and the crystals, having only three symmetry planes, resemble orthorhombic forms. The two crystals in the Brush Collection, which are so nearly alike that they cannot be told apart, are represented in Fig. 28. [Sold to Prof. Brush by G. L. E. & Co.] Fig.



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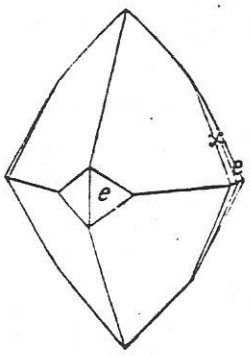

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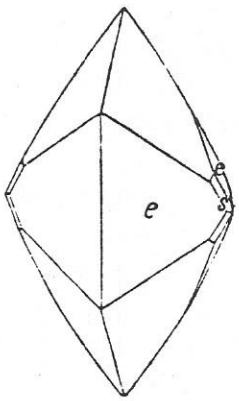

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29 represents a crystal in the Bement Collection where the edges between the *e* faces at the sides and *r* are replaced by a form *x* in the zone *e*, *r*. The *x* faces are all rough, and admit of only approximate measurement with the contact goniometer. The symbol was determined to be (6, 12, 7), $2—\frac{1}{7}^2$. There are only eight of these faces, instead of the twenty-four which we should expect in an ordinary pyrite crystal. Fig. 30 represents a

crystal in the Bement collection, in which the *e* faces are larger. This is the most unsymmetrical of all the crystals; on the side, which is turned away from the observer, the *e* faces are so large that the front and side ones just meet, forming a solid angle, and leaving none of the middle edges between the lateral axes; on the other side, which is shown in the figure, the *e* faces are still larger, and the edges between them are replaced by the small *s* faces 231, $3-\frac{3}{2}$. The *s* faces were bright, and admitted of approximate measurement on the reflecting goniometer, giving $s \wedge s$, $231 \wedge 23\bar{1} = 30° 40'$, calculated 31° 0′. These *s* faces differ from the ordinary pyrite combination, for with 210 and 021 usually 321. 132 and 213 occur in one octant, while here only one of the alternating faces 231 occurs.

All who have seen these crystals pronounce them the most curious and interesting pyrite crystals that they have ever seen. Why they have been distorted in this peculiar way I cannot venture to say. Some law must have governed them, for they all have such perfect, though lower than isometric, symmetry. It is perhaps the result of the vicinal development of the faces which is so common at the locality. If in Fig. 31, which is the ordinary isometric trigonal-trisoctahedron 332, $\frac{3}{2}$, the four *r* faces in front, and the corresponding ones behind were extended they would give a tetragonal pyramid like Fig. 26, except that Fig. 26 has been somewhat shortened by the curved nature of the faces. The curious forms which we have been considering I prefer to regard as abnormally developed trigonal-trisoctahedrons. That they are really isometric is proved by the occurrence of the ordinary pyrite form $\pm(210)$, $\frac{1}{2}(i-2)$. The behavior of one of the curved crystals on the reflecting goniometer is also quite striking. Measuring from pyramid to pyramid over the vertical axis the very points gave sharp reflections of the signal, and then on turning the crystal there followed an unbroken band of light, with no sharp reflection of the signal, as long as different parts of the curved surfaces were in a position to reflect the light. The angle between the sharp reflections of the signal, obtained from the very minute flat surfaces at the points, was found to be 109° 36′, calculated for $o \wedge o$ $(111 \wedge \bar{1}\bar{1}1)$ 109° 28′. We see from this that our steep $\frac{3}{2}$ pyramid at the base, becomes by the curving gradually flatter till it corresponds to a unit pyramid or octahedron at the vertex.

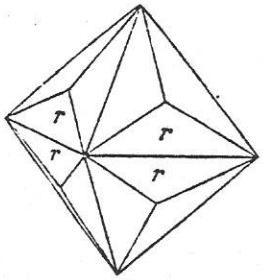
The specific gravity of two of the crystals, represented in Figs. 26 and 28, was found to be 5.016 and 5.022 respectively.

MINERALOGICAL LABORATORY, SHEFFIELD SCIENTIFIC SCHOOL,
December 18th, 1888.

Additional Note.—Very recently Mr. George L. English of Philadelphia sent me a suite of French Creek pyrites . . . containing six of the elongated pyramids, mostly of the Fig. 28 type, also a number of cube octahedron and pyritohedron combinations which are modified and

rounded by the occurrence of vicinal faces and one crystal, forming a sort of connecting link between an octahedron and the Fig. 26 type, where the octahedron and some trigonal trisoctahedral faces round off and blunt the apex of the pyramid. He also informs me that the isolated crystals occur imbedded in calcite. S. L. P.

Several other interesting forms, beside the above described, occur at the French Creek mines. One of these is shown in Fig. 32. The demand



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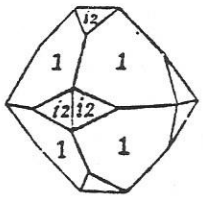

No. 32.

for all these modified octahedrons is far greater than the supply. It is only occasionally that we are able to secure one or two of them. If our customers will kindly file their orders with us we will endeavor to supply them. Prices $1.00 to $7.50. Bright, regular octahedrons, 5c. to $2.50.

French Creek Chalcopyrite.

The crystallized chalcopyrite of the French Creek Mines, in Chester Co., Pa., has long been well known to collectors of fine minerals. The crystals are mostly on a base of the same mineral, more or less mixed with pyrite, magnetite and amphibole. The crystals occur completely imbedded in a calcite, rendered green by the multitude of crystals of byssolite embedded in it. This is dissolved off with acid, leaving the crystals of the copper pyrites in beautiful groups, having a very rich and varying iridescence, blue and copper-red colors predominating. We have bought all the specimens obtainable direct from the mines, and our prices have always been low, 50c. to $2.50 for large drawer specimens, $2.50 to $7.50 for shelf and museum specimens. Recently some remarkably sharp, detached crystals of interesting forms have been sent us. A paper on these crystals by Professor Penfield will shortly appear in the *American Journal of Science*. Prices 5c. to 50c. each.

Editor's Note: The excerpts above from a 1890 George English mineral catalog, a gift of economic geologist Franz Dykstra, are reproduced courtesy of the Geology Department of Bryn Mawr College.