FRIENDS OF MINERALOGY

Pennsylvania Chapter

NEWSLETTER

Vol. 20, No. 1, Spring, 1992 **Page 1**

PRESIDENT'S MESSAGE

The May field trip to the Sterling Hill Mine was very interesting, and those who attended enjoyed it. Dick Hauck, rescuer of the Mine and a founder of the Museum, is a Chapter member, and gave us a personal tour. I wish to thank him, and recommend a trip to the famous Mine and Museum in Ogdensburg, New Jersey.

Mark July 18th on your calendar, as it is the date for the Swap and Sell at Coopersmith Park, West Chester, rain or shine, from 9 to 4 p.m. Bring family and friends, a picnic lunch, and something to share, not forgetting minerals to swap or sell. Enjoy the super hot dogs Bill Yocom will provide again, under cover in the pavillion, and take a walk under the trees of the park. The Chester County Rockhounds have arranged for the park facility, and sponsor the event, along with our group and the Mineralogical Society of Pennsylvania. See you then.

We are holding a raffle (see details on page 4), in order to raise money for Chapter activities, including upgrading the Symposium. So why am I telling you all this? I want you to buy raffle tickets, with the chance of winning a fine mineral specimen or jewelry set! My personal thanks go to Jim and Jean Bey, whose rock shop is located on Rt. 100, north of Boyertown, for their support of this project, and to Bill Yocom for making the arrangements, and making the jewelry.

By the way, congratulations to members Bill Yocom, Curator, and Sy Greenberg, retired professor of geology, for whom the new mineral museum at West Chester University was named at a reception on April 11. This gem of a small museum is located next to the lecture hall where the Symposium will be held in September. A schedule of hours when the museum may be viewed will be announced soon by Bill Yocom.

Which reminds me. Don't fail to save the dates (September 25, 26, and 27) for the Fall Symposium. We have lined up some excellent speakers, but we need your input for "What's New," on Friday night. The raffle drawing will be held at the Symposium, on Saturday, as will the auction. We will solicit donations for the latter at the July Swap and Sell, or get in touch with me to make other arrangements.. Donated items for the auction, which raised $550 last year, may include good quality specimens of minerals, historical items such as mining equipment and/or certificates, and books on mineralogy, as well as lapidary work. A program and registration form for the Symposium will appear in the Summer *Newsletter*.

Good hunting. See you in the fall.

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MEMBERSHIP INFORMATION

Special Dues Notice: Dues for the Pa. Chapter, which include the National dues, are now $10.00, and $8.00 for seniors over 62, or students. You will be dropped from the mailing list for the *Newsletter* and fliers, if your 1992 dues are not paid by June 30, 1992. The editor will send any back issues as soon as the dues are paid.

If you have already paid the $7.00 dues, as in 1991, your payment of the extra three dollars for 1992 would be very much appreciated, since the National dues have gone up to $5.00. Send your dues to Marge and Vince Matula, Membership Chairmen, 10231 Honeysuckle Drive, Walnutport, PA 18088.

New Member: C. Carter Rich, P.O. Box 91, Aldie, VA 22001.

Editor: Juliet C. Reed, 336 Rockland Rd., Wayne, PA 19087 (215-688-6180)

NEWS AND VIEWS

Kadlecik Education Fund Established

With the passing of John M. Kadlecik, Sr., on May 20, 1992, the Pennsylvania mineralogical community lost a dedicated leader involved in facilitating education on the earth sciences among the youth of the greater Philadelphia area. An avid field collector for more than 35 years, John was recognized for his willingness to share his love and knowledge of mineralogy.

To commemorate John's long-time interest in mineralogy, his family and friends have, in conjunction with the Mineralogical Society of Pa. (M.S.P.), established the "Kadlecik Education Fund," which will be used to provide Earth Science Teaching Kits to Philadelphia schools. Financial contributions should be made to: Mineralogical Society of Pa., Kadlecik Education Fund, 532 Vista Road, Ambler, PA 19002. Contributions of mineral and fossil specimens are also appropriate. For further details, contact: Hnery Decker (215-643-0840) or Paul Lazar (215-275-4257).

John was a member of the following mineral groups: Mineralogical Society of Pennsylvania; Philadelphia Mineralogical Society; Leidy Microscopic Society; Chester County Rockhounds; North Penn Rock and Mineral Club; Bucks-Mont Mineral and Lapidary Club; and the Friends of Mineralogy, Pa. Chapter.

Paul Lazar

Correction

Larry Eisenberg has tactfully pointed out to the editor that part of two sentences were left out of his article on "Sugar Grove, a West Virginia, Pyrite Locality," F.M., Pa. Chapter, *Newsletter*, Vol. 19, No. 4, Winter, 1991., page 6, in the third paragraph on "Pyrite." The corrected sentences read as follows:

"The bent crystals are attached to two points in the vug, and the crystal creates an arc between these points. The filiform crystal is caused by the spiral growth on one face of the cube."

NEWS AND VIEWS (Cont'd)

Take a Chance!

The Friends of Mineralogy, Pa. Chapter, is sponsoring a raffle to provide funds for expenses of the annual Symposium, such as travel for speakers from a distance.

Bill Yocom, who has made the arrangements, has announced that books of tickets will be available at swaps and shows before the Sept. 25, 26, and 27 Symposium, or from him, at 27 Dean St., West Chester, Pa. 19380 (you may arrange with Bill to take books of tickets to your club meetings).

Each book has 6 tickets, for $10.00, or tickets may be obtained for $2.00 each. Printing of the raffle books was made possible by a donation from Jim and Jean Bey, of Bey's Rock Shop, a treasure house of gems and Jewelry makings, as well as fine specimens from around the world, located on Rt. 100, just north of Boyertown, Pa. A drawing for the winning tickets will take place at the Symposium, on Saturday, September 26. However, you do not have to be present to win one of the prizes.

First prize is a Uruguayan amethyst specimen, valued at $208; second prize is an amethyst necklace and earring set, with 14K gold accents, valued at $125.00; third prize is a $100.00 quartz specimen with pyrite, from Peru; fourth prize is a malachite necklace and earring set, with 14K gold accents, valued at $75.00; and fifth prize is a hematite necklace, with 14K gold accents, valued at $50.00.

Support the Symposium. You may win a fine specimen, or one of Bill Yocom's unique creations.

Coming Events

July 18: All collectors, their friends, and families are invited to a Summer Social Swap and Sell, sponsored by the Chester County Rockhounds, the Mineralogical Society of Pennsylvania, and the Friends of Mineralogy, Pa. Chapter, rain or shine, at Coopersmith Park, on Spring Lane, off Rt. 3, just east of Rt. 202, West Chester, from 9 a.m. to 4 p.m. Free admission and limited table space (tailgating allowed). For information, call Bill Yocom, (215) 696-2575.

July 25: Mineralogical Society of Pennsylvania Swap and Sell, Solanco Fairgrounds, Quarryville, Lancaster Co., Pa.

August 19-23: 6th Annual Lost Durchman Gemboree, Lebanon Fairgrounds, 5 miles north on Rt. 72 from Pa. Turnpike Exit 20.

September 12-13: Tuscarora Lapidary Society Gemarama '92, Newtown Square, Pa.

September 19-20: Central Pennsylvania Rock and Mineral Club Gem, Mineral, and Jewelry Show (Eastern Federation Show), Zembo Temple, Harrisburg, Pa.

September 25, 26, and 27: Fall Symposium on "Eastern Mineralogy, from Maine to Florida," sponsored by the F.M., Pa. Chapter, at West Chester State University.

October 17 and 18: Annual Gem and Mineral show of the Mineralogical Society of Pennsylvania, Solanco Fairgrounds, Quarryville, Lancaster County.

Research on Twinning in Rutile Crystals

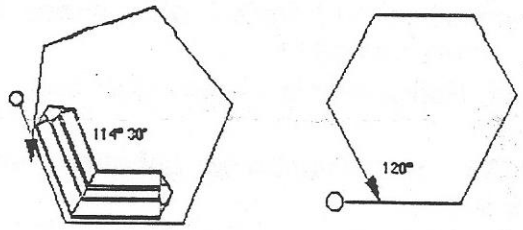
R. Peter Richards, author of an interesting article on "Calcite from Thomasville, Pennsylvania: Morphology and Twinning" in the May-June,1992, issue of *Rocks and Minerals*, wrote the editor about his research on twinning in rutile:

The rutile question I mentioned to you is one which I have been pondering for about three years, and has to do with how one can distinguish between the two twin laws for rutile. The common one makes angles of about 120°, whereas the rare one makes angles of about 60°. Thus, it would seem that a crystal twinned twice in nearly the same spot, according to the common twin law, could look like it was twinned according to the rare twin law. When I did some calculations, it turns out neither angle is an exact multiple of 60o, and the common law done twice would give an angle of 49° 49'. while the rare law would give an angle of 54° 42'. These are different enough to distinguish by careful measurement.

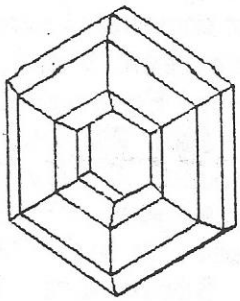
The story goes on! Rutile sixlings are crystals twinned five times in succession on the common twin law (or at least that's the usual understanding). They are often drawn like a regular hexagonal donot,. All the edge angles are 120°, and there is a nice hole in the middle. Now, a carefully constructed accurate drawing shows that a true five-times twinned crystal looks quite different, as can be seen below - it is more nearly a pentagon. Drawings like this can be found in Goldschmit's Atlas, also. The point is that an "ideal" hexagonal sixling cannot be the result of repeated twinning. Maybe it could result from some kind of epitaxial overgrowth on a small hematite or ilmenite crystal. Maybe it is just a figment of some ancient mineralogist's imagination, an extrapolation from a knee twin or a twice-twinned crystal, for example, without careful measurement. It seems that we still have a lot to learn about rutile!

So, I am very interested to know if compolete rutile sizlings exist. The Parkesburg crystals are supposed to occur as complete sixlings, according to Bryon Brookmyer, but I have never seen one. I would be very interested to know of any collectors who have complete sixlings, and to know whether they have a hole all the way through, like a donut, or maybe just a dimple part way through in the middle. I would especially like to borrow any such crystals people might be willing to entrust to me, for study and photography.

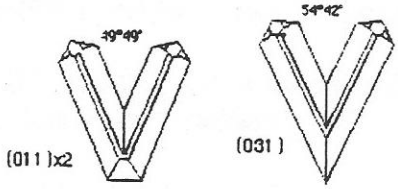
Incidentally, this mystery pertains only to sixling twins. Eightlings have their own problems, but they are not as difficult to explain, and besides, that is another project!



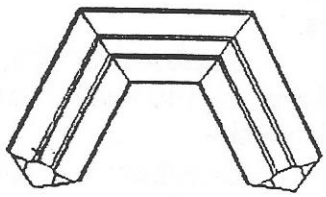
Truth and misconception about the the shape of a cyclic rutile sixling.



Rutile sixling "donut"



Two ways of getting v-shaped twins and the resulting angles - the observation which got me started....neither is 60°!



Twice twinned geniculate rutile twin

A WURTZITE LOCALITY: DONOHOE, WESTMORELAND COUNTY, PENNSYLVANIA

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In September, 1988, Dr. R. Peter Richards led another collector and myself to his favorite collecting spot for wurtzite (hexagonal or trigonal ZnS) crystals near Donohoe, Pennsylvania. Micro-crystals of very lustrous, orange-brown, hemimorphic wurtzite, of several polytypes, were readily found in the easily-collected septarian concretions. In addition, tetrahedral sphalerite crystals were found as oriented overgrowths, in epitaxy, on wurtzite, an association not previously reported in the literature on the locality.

A description of wurtzite occurrences in western Pennsylvani and eastern Ohio was reported in two articles in the *American Mineralogist* (Frondel and Palache, 1950; Seaman and Hamilton, 1950), and subsequently in *Earth Science* (Seaman, 1977) and the *Canadian Mineralogist* (Hollenbaugh and Carlson, 1983). The wurtzites were described as occurring in the clay-ironstone concretions, just above the Brush Creek Shales of the Conemaugh Formation, at several localities in eastern Ohio and western Pennsylvania. Briefly mentioned was the railroad cut about 5/8 mile east of Donohoe, about four miles east of Greensburg, Westmoreland County, Pennsylvania.

Here, Dr. Richards found that the concretion-bearing layer nearly reaches the bottom of the 80-to-100 feet deep railroad cut, directly under the bridge, 3/8 mile west of the bridge on Buffenmeyer Rd. (where we were able to walk into the railroad cut). Further east, the concretion-bearing shale rises much higher, and the Brush Creek coal seam is exposed. We collected entirely on the south side of the cut. Figure 1 shows the approximate locality, on a section of the Latrobe Quadrangle topographic map.

I collected approximately 282 septarian siderite concretions, typically from one to three inches in diameter, in about three hours, which incuded a lunch break. Initially, some time was used to crack the concretions in half to see if they had calcite veins. Concretions without calcite were discarded; this seemed a worthwhile process, since the ironstone is so heavy. However, so many of the concretions seemed to contain calcite that, after an hour, I stopped breaking the concretions and just tried to collect as many as I could. Looking at the size of the concretion-bearing zone, one gets the impression that the supply of wurtzite is without end! I filled two large buckets 3/4 full, until I could hardly carry them, at which point I began the painful walk on the railroad gravel with my heavy load, back to the car.

Specimen preparation involved breaking up the concretions into small pieces to expose all possible calcite veins. Calcite-bearing pieces were then placed in warm, dilute HCl for five to ten minutes, then in water, and finally rinsed. Every piece was then examined with the microscope, as many crystals, especially epitaxic sphalerite on wurtzite, can go unnoticed by the unaided eye.

Out of 168 concretions processed, 45% contained wurtzite and calcite, 42% were empty (no calcite or barite), 8% contained calcite and sphalerite, while only 3%

A WESTMORELAND CO. WURTZITE LOCALITY (Cont'd)

contained calcite, barite, and wurtzite, and 2% contained barite and wurtzite.

Unfortunately, the process of exposing the calcite veins also tends to cleave the wurtzite crystals. The best crystals are found in pieces that do not show the wurtzite until after the calcite has been dissolved away. Unlike the occurrence at Negley, Ohio, where hollow concretions are common, only one concretion that I broke was hollow, lined with white kaolinite (?), brown wurtzite, sphalerite, and golden, drusy pyrite. Only one concretion had a solid, pyritized interior. While a few had fossil shells in them, these were poor, and difficult to break out of the ironstone. The sphalerite is very abundant, forming from very thin, curved plates, or dendrites, to thicker and elongated twinned aggregates. Some of the thin plates show an interesting triangular zoning.

The wurtzite crystals occur in a wide variety of very interesting habits. Many are sharp, pedion-terminated, brown-to-orange pyramids, up to 2 mm long. Most common are the hexagonal polytypes, 4H and 6H (Seaman (1977). Dramatic clusters of these wurtzites are often found in radial aggregates, with their pyramids pointing to the center of the clusters. On occasion, long, thin, distorted crystals can be found, which seem to have resulted from a second generation of growth on an earlier crystal. A variety of complex modifying forms are often observed around the pedion termination. Occasionally, small hexagonal pyramids are found, which are orange and completely transparent. These are often observed with their sharp termination appearing to grow from the edge of the pedion of a larger, but opaque, crystal.

Some of the most interesting and beautiful of the habits are found in the trigonal wurtzite polytypes. Polytypes 15R, 18R, and 21R have been described, although samples from the current collecting trip have not yet been X-rayed. Small, stubby, opaque crystals, with frosted surfaces, are the most common (Fig. 2). These show a pedion, dominant first-order pyramid, and smaller second-order pyramid. Figure 2 also shows that the frosty luster may be due to a stepped growth that nucleated at the pedion edges. Figure 3 shows a trigonal crystal growing from the edge of the pedion of a hexagonal polytype. The irregular, sharp crystals are sphalerite (probably twinned) and the matrix is siderite. A very striking, though rare, trigonal morphology is show in Fig. 4. These crystals are rather transparent, and sometimes show phantoms. The most striking feature is that the geometry allows for a strong, total, internal reflection of incoming light. Orienting the crystals just right under the microscope and light leads to a flash of orange light, giving the crystal a truly brilliant appearance.

Some of the most rare associations are shown in Figs. 5-7. The tetrahedra are sphalerite in epitaxy on the pedion of wurtzite. While epitaxic sphalerite and wurtzite have been described from numerous other localities, it has not yet been described from this occurrence. Furthermore, all of the samples have only one wurtzite per sphalerite, suggesting that the pedion is the most active growth facet. Very often, the tetrahedra corners can be seen to be protruding past the edges of the wurtzite pedion (Fig. 5). These crystals tend to be extremely small, and care must be exercised to find them. Since the sphalerite surfaces are very lustrous, triangular reflections of light are a useful aid in locating these crystals. In very rare cases, the sphalerite is in epitaxy on a trigonal wurtzite.

A WESTMORELAND CO., PA., WURTZITE LOCALITY (cont'd)

Acknowedgements

The scanning electron micrographs shown in the Figures are courtesy of the Ohio State University Materials Research laboratory.

Reproduction of the micrographs was made possible by the contribution of half-tones prepared by Jay Lininger.

References

Frondel, C. and Palache, C., 1950, *American Mineralogist*, Vol. 35, No. 1 and 2, p. 29-42.

Hollenbaugh, D.W. and Carlson, E.H., 1983, *Canadian Mineralogist*, Vol. 21, p. 697-203.

Seaman, D.M. 1977, *Earth Science*, Vol. 30, p. 181.

Seaman, D.M., and Hamilton, H., 1950, *American Mineralogist*, Vol. 35, No. 1 and 2, p. 43-50.

U.S. Geological Survey and Commonwealth of Pennsylvania Dept. of Environmental Resources, Topographic and Geologic Survey, 7.5 Minute Series, *Latrobe, Pennsylvania, Topographic Map*, 1965, revised, 1979.

Figures

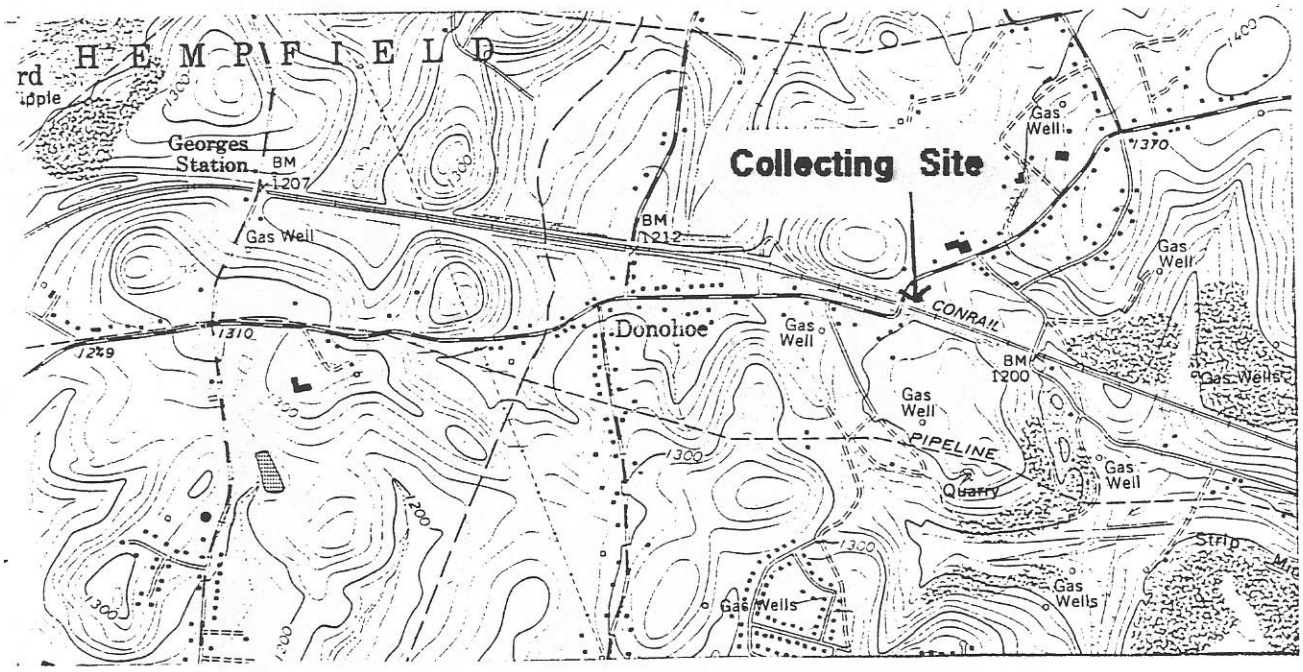

Fig. 1. Portion of the Latrobe, Pa., Quadrangle Showing The Collecting Site.

A WESTMORELAND CO., PA.,WURTZITE LOCALITY (Cont'd)

Figures (Cont'd)

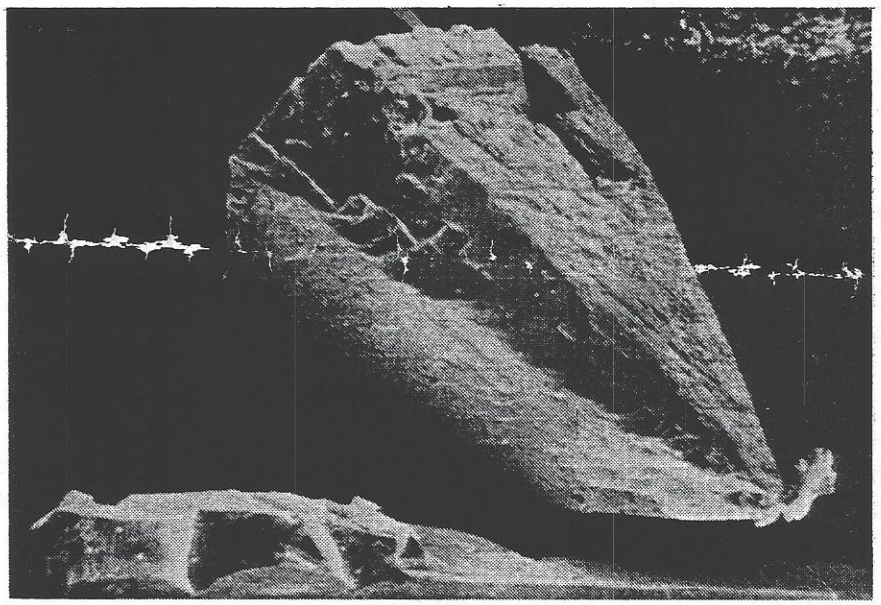

Fig. 2. Frosty Trigonal Wurtzite Polytype, 0.3 Mm Long.

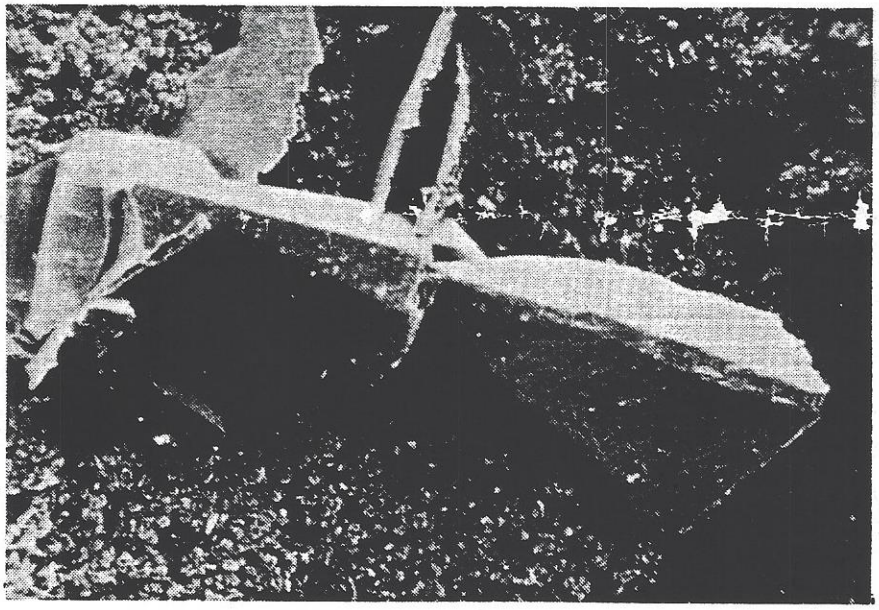

Fig. 3. Trigonal Wurtzite (0.3 mm.) on Hexagonal Wurtzite With Sphalerite.

A WESTMORELAND COUNTY, PA., WURTZITE LOCALITY (Cont'd)

Figures (Cont'd)

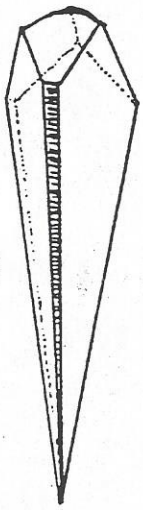

Fig. 4. Drawing Of Trigonal Wurtzite (Up To 1.5 Mm) That Exhibits Total Internal Reflection.

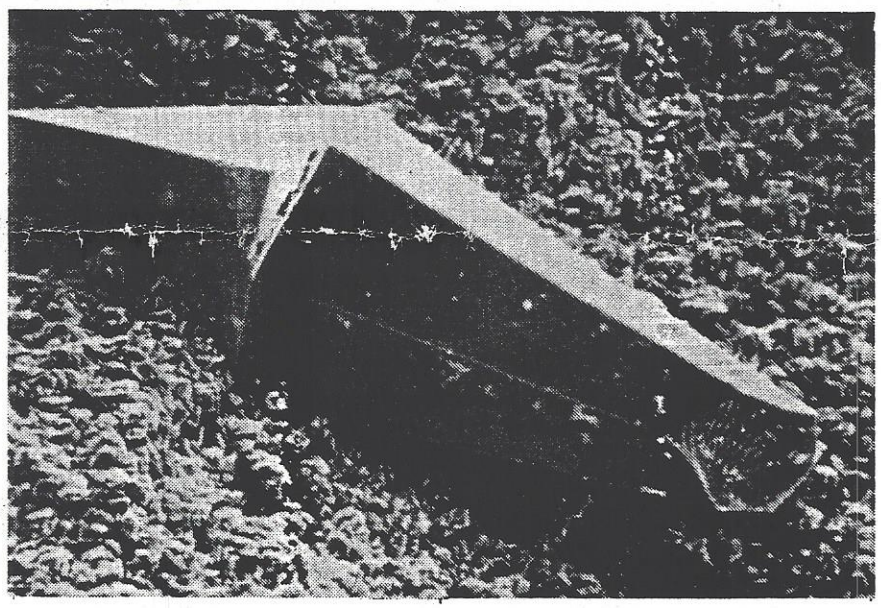

Fig. 5. Lustrous Sphalerite Epitaxy on Hexagonal Wurtzite (0.02 Mm.).

A WESTMORELAND COUNTY, PA., WURTZITE LOCALITY (Cont'd)

Figures (Cont'd)

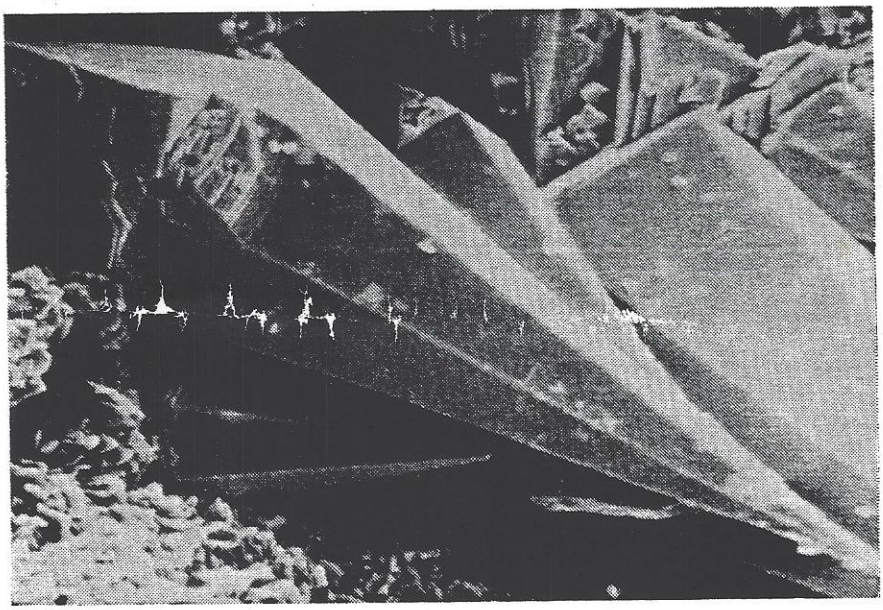

Fig. 6. Sphalerite Epitaxy on Hexagonal Wurtzite (0.13 Mm).

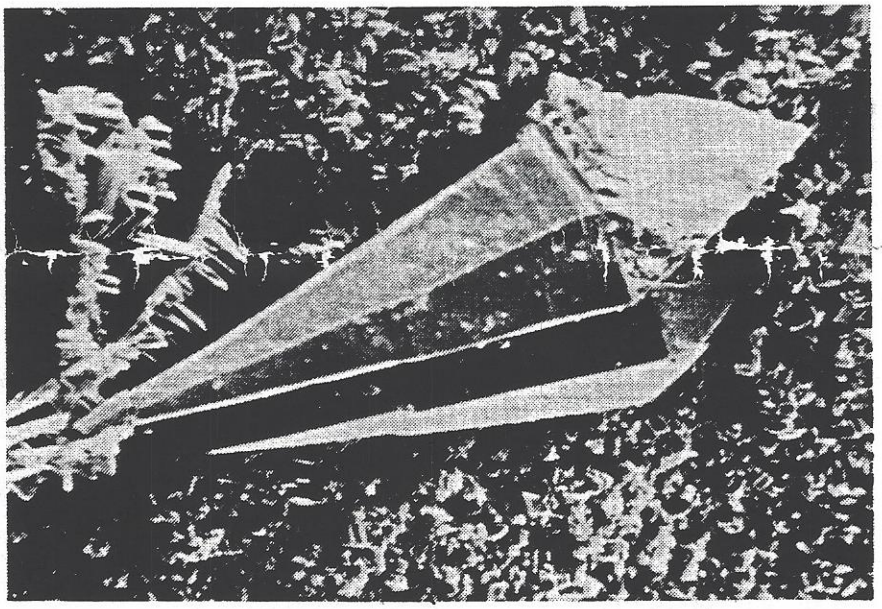

Fig. 7. Sphalerite Epitaxy On Hexagonal Wurtzite (0.02 Mm).