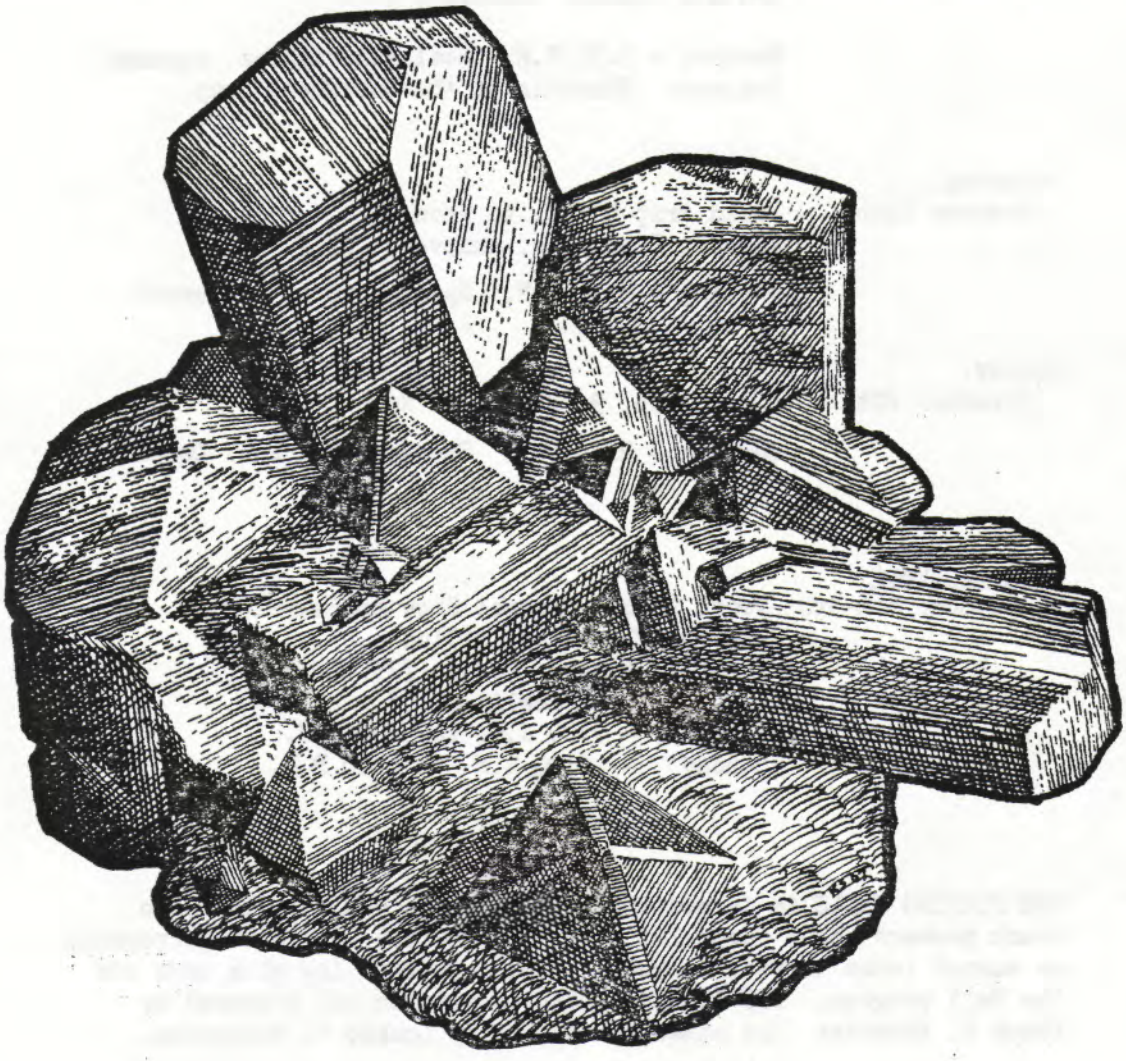
THE PICKING TABLE

JOURNAL OF THE FRANKLIN·OGDENSBURG MINERALOGICAL SOCIETY



VOLUME VII AUGUST 1966 NUMBER 2

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CLUB PROGRAM - FALL 1966

All meetings will be held at the Hardyston School, intersection of Routes #23 and #517, Franklin, N. J. Pre meeting activities start at 1:00 P.M.; speaker will be announced at 2:30 P.M.

Saturday,
September 10th - Field trip to N. J. Zinc Co. Quarry at Friedensville, Pa.

September 17th - Field trip 9:00 A.M. to Noon - Cellate Quarry, Franklin, N. J.

Meeting - 2:30 P.M. Neal Wintringham, speaker.
Subject: Minerals of the Buckwheat Dump

Saturday,
October 15th - Field trip 9 A.M. to Noon - Andover Iron Mine, Andover, N. J.

Meeting - 2:30 P.M. Speaker to be announced.

Sunday,
November 20th - Field trip, 9:00 A.M. to Noon

Meeting - 2:30 P.M. Speaker, Mr. Paul DeSautels

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Special Event
October 8th-9th Tenth Annual Mineral Show sponsored by the Franklin Kiwanis Club - Franklin Armory, Routes #23 and #517, Franklin, N. J.
Saturday - 9:00 A.M. to 9:00 P.M.
Sunday - 9:00 A.M. to 6:00 P.M.

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THE PICKING TABLE is issued twice per year; a February issue to reach members about March 1st with news and the Club Spring Program; an August issue to reach members about September 1st with news and the Fall program. THE PICKING TABLE is written and prepared by Frank Z. Edwards; the mimeo and typing by Louise W. Borgstrom.

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F.O.M.S. OFFICERS FOR THE YEAR 1966

President	Dr. Harry E. Montero
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Frank Z. Edwards '66 Frederick A.Kraissl '67
Edmund Frey '66 Kenneth Sproson'66
Richard Hauck '66 (alternate)

F.O.M.S. Notes

All quiet at administration headquarters after a pleasant and successful Spring program. The fall events hold great promise and should be equally well attended.

At the October meeting, the Nominating Committee will present nominations for the administrative officers for the year 1967. Your suggestions as to possible nominees will be appreciated and considered.

A committee has been appointed to seek the second republication of Palache's Professional Paper #180, which is again out of print. Ex President Fred Kraissl discussed this at the annual meeting of the Eastern Federation and that organization will join us in this effort; to them we extend our sincere thanks.

Mr. Edmund Frey, 291 Summit Road, Mountainside, N.J. is chairman of our Lapidary Committee. He has again promised an F.O.M.S. exhibit of lapidary work on Franklin minerals for the Annual Kiwanis Show on October 8th-9th. If you have any interesting material of this nature that you would like to display, please communicate with Mr. Frey.

Members who enjoy collecting at the Buckwheat Dump will be pleased to know that the area was again bulldozed on the weekend of July 30th/31st. When visiting at Franklin, plan to see the displays at the Franklin Mineral Museum. Admission charges have been reduced to 50¢ for adults, 25¢ for children. Reactions of visitors have invariably been enthusiastic.

10th Annual Franklin Mineral Show

On October 8th and 9th, the Franklin Kiwanis Club will sponsor the 10th Annual Franklin Sterling Mineral Exhibit, at the Franklin Armory, Routes #23 and #517, Franklin, N.J. The nominal admission charges gives entrance to the dealers' area, mineral exhibits, the Buckwheat Dump, the Franklin Mineral Museum and the Mine Replica. Every collector, novice to expert, always enjoys this event. Plan on coming and bring your friends.

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Barylite

"The crystal structure of barylite, $BaBe_2Si_2O_7$" by K.K. Abrashev, V. V. Ilyukhin, and N. V. Belov. Soviet Physics: Crystallography, 1965, Vol. 9, pages 691-699. Min. Abst., March 1966, p. 460.

"Barylite from several localities, including that recently reported from the Vishnevye Mountains, was used. Cell dimensions were not redetermined; Z=4. A strong piezoelectric effect, statistical tests, and satisfactory residual factors (hk0 18.4%, 0kl 18.25%) justify the space group $Pn2_1a$, adopted for the structure. The structure is described in terms of polar Be_2O_6 chains parallel to the short axis (c, 4.63Å), supported by columns of Ba in cubo-octahedral coordination. These chains are connected through shared oxygens by Si_2O_7 pairs of tetrahedra. The oxygen together with the barium atoms approach hexagonal close-packing with c the pseudo-hexagonal axis and both Si and Be in tetrahedral interstices between the hexagonal sheets. Analogous features in other metaberyllates and metazincites are pointed out. Techniques appropriate to the location of light atoms in the presence of heavy ones in structural studies are discussed."

Larsenite

"Crystal structure of Larsenite, PbZnSiO4" by C. T. Prewitt and E. Kirchner and A. Preisinger, American Min., Jan-Feb. 1966, vol. 51, nos. 1 and 2, page 269.

"Larsenite is a rare mineral reported from Franklin, N.J. It is orthorhombic with a=8.244, b=18.963, c=5.068Å, Z=8, space group $Pna2_1$, and is piezoelectric. The structure, determined using three dimensional diffractometer data, is not similar to that of olivine as was previously thought; nor is it closely related to the structure of esperite (calcium Larsenite) which has recently been determined. Instead, it is an entirely new type composed of a network of corner-linked zinc and silicon tetrahedra and "three-sided" and distorted "four-sided" lead pyramids, respectively. The structure has been refined by least squares to an R of 0.055 for all reflections."

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The rest of this issue is devoted to an original paper by your editor on the minerals recently found at Sterling Hill. This important ore body constantly produces interesting specimen material. In the usual course of events, such specimens are quickly dispersed into widely scattered collections; information on locations and associated minerals becomes lost; and both the past and the future suffer from the neglect or indolence of the present.

I believe that an effort should be made to alter such an arid course. I believe that as much information as possible should be recorded while it is still fresh and subject to check and verification. Such written data will then be available to all of us at any time. It will help both the collector and the trained mineralogist. This paper is a start in that direction. So far this has been a purely personal effort. I hope that in the future you will join me in making this a united effort and a continuing Club project and objective.

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THE MINERALS OF STERLING HILL 1962-65

Frank Z. Edwards

On January 1st, 1962, after a shutdown of 40 months, the New Jersey Zinc Company officially resumed mining operations at the Sterling Hill Mine, Ogdensburg, N.J. (Note #1). In the four rears since then, a quantity of interesting specimen material has reached the surface. Unfortunately, literature concerning Sterling Hill minerals has been scarce (Note #2). A broad picture of the activities of this mine and the minerals found therein is overdue and this paper is an attempt to answer that need.

This paper provides data which is current and still subject to verification. It suffers from at least two failings. The author is a mineral collector and not a trained scientist. As a result, descriptions are limited to external appearance and characteristics. Also, this paper presents the observations of only one person; and to this extent the information is limited. It is the author's intention, at this time next year, to issue a new and expanded report for the period 1962-66. For maximum value, the observations of others should be included. Therefore, I invite all interested and qualified observers with additional information or unusual specimen material to communicate with me through the F.O.M.S., or at home, 100 West Shore Trail, Sparta, N. J., 07871; phone 729-6043, area code 201.

While this report will primarily interest and assist the mineral collector, I do hope that it will serve to pique the curiosity of our professional friends and lead to research of the Sterling Hill minerals. Such research is needed and would be most welcome.

Every attempt has been made to keep this report accurate; doubtful or hearsay information has been omitted; and only specimens properly validated by responsible personnel are described herein (Note #3). Unless otherwise stated, the specimens described may be seen in one of four collections;

1) Exhibits at the Franklin Mineral Museum, particularly the Mine Hill Mineral Shop collection.
2) The Ewald Gerstmann collection on exhibit at the Gerstmann Private Museum.
3) The private collection of John MacDonald.
4) The author's personal collection.

The author is indebted to many people in the Franklin area for information supplied over a period of time. These include miners, local mineral dealers and fellow collectors. To all who have provided me with such source material, I extend my thanks. A special thank you goes to Mr. John L. Baum, who in his dual capacity as Curator of the Franklin Mineral Museum and Regional Geologist with the New Jersey Zinc Company, has provided considerable information and helped weed out misinformation.

Note #1 - Ore production actually resumed on a limited basis on December 18th, 1961 when Supt. D. J. Mc Kechnie switched ten miners from maintenance work to ore extraction.

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Note #2 - All such literature, in full or in abstract, has appeared in previous issues of The Picking Table. See:

The Sterling Hill Mud Zone - July 1962, Vol. III, No. 2.
Willemite and Its Polymorphs - August 1963, Vol. IV, No. 2.
Hydrohausmannite and Hydrohetaerolite - February 1964, Vol. V, No. 1.
Manganopyrosmalite - August 1964, Vol. V. No. 2.
Woodruffite - August 1964, Vol. V, No. 2.
Sussexite - August 1965, Vol. VI, No. 2.
Franklinite - February 1966, Vol. VII, No. 1.
Pyroaurite - ditto
Uraninite - ditto
Feitknechtite/Hydrohausmannite - February 1966, Vol. VII. No. 1.

As prior reading, the serious student is directed to the June 1958 issue of the Bulletin of The Geological Society of America, pages 775-788, volume 69; for "Geochemistry of the Sterling Hill Zinc Deposit, Sussex County, New Jersey" by Messrs. R. W. Metsger, C.B. Tennant and J. L. Rodda.

Note #3 - Be wary of specimen material of doubtful identification or origin. At least two attempts have been made by local miners to pass foreign specimens for Sterling Hill material. One involved rose quartz crystals from Pennsylvania and the other a black metallic synthetic mineral produced in an Ohio plant.

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At Sterling Hill, the New Jersey Zinc Company mines zinc ore, crushes and grinds the ore to size; and ships the powder to the Palmerton smelter for further treatment. Production in the 1962-65 period averaged 1000 tons per day. Company estimates as of December 1st, 1965 indicate an ore body of 4,750,000 tons of proven ore, averaging 20.1% zinc. Mining methods used are horizontal cut and fill for stopes and square sets for pillar recovery; all excavated openings are refilled with gravel.

The ore minerals are franklinite, willemite and zincite. In lean mineralized areas, franklinite, tephroite, pyroxene and biotite are also found. All blasted rock is sent to the crushers; no attempt is made to separate ore from gangue or matrix.

All levels have been mined although major attention has been given to the North Ore Body, the deepest levels in the mine. On the 1850' level, the Lamont Geological Institute operates an important seismic station.

To the mineralogist, three areas in the mine are of particular interest:

1) The North Ore Body, particularly the 2350' and 2450' levels, which have produced fine specimens of sussexite, mooreite, magnesium chlorophoenicite, pyrochroite, fluoborite and pyroaurite, a new mineral for Sterling Hill.

2) The Mud Zone, an unusual area, fully described in the July 1962 issue of The Picking Table. From this region come the manganese oxides, hemimorphite, and good micro crystal specimens of other minerals.

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3) A partially altered or intermediate zone, 5' to 10' wide, between the Mud Zone and the unaltered ore body. This area has produced good micro crystal specimens of calcite, quartz and celestite. Also copper alteration products such as azurite, malachite, chrysocolla, covellite and others still not identified. Native copper has not been found and the source for these copper alteration minerals is not known. This area deserves a special study and report.

Most of the specimen material from Sterling Hill is massive and crystal specimens are not common. Micro crystals occur in the vuggy material of the Mud and Intermediate zones, also as drusy coatings from other areas. Specimens of larger crystals are usually found in a calcite matrix in areas of lean mineralization. Altering minerals and alteration products are common. Several collectors have interesting unidentified specimens which offer possibilities as new species for the location.

For convenience, the minerals described in this report are listed in alphabetical order. Since the species described are only those seen or verified by the author, the omission of a species does not mean that it does not occur or has not been found at Sterling Hill during these four years. A list of species previously found at Sterling Hill but not described in this report is given on the final page. Information on these species is particularly requested for next year's report.

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Anhydrite

This species is rare for the locality. In the Franklin Mineral Museum may be seen a specimen from the Mud Zone of gypsum with small areas of white anhydrite. Also on display is another specimen, about 1-1/2" square, of a cream colored massive anhydrite but no associated minerals. This piece came from on old collection.

Antigorite

Antigorite is the catch all name given to all green or blue coatings or massive serpentine. Such material is common. An interesting specimen is of brown massive willemite, altered and altering to a bright green antigorite. Another interesting piece shows a mica crystal altered to a dark green antigorite.

Apatite

In the southwest corner of the open cuts at Sterling Hill is a deposit of apatite crystals. On the 1964 field trip of the F.O.M.S. some collector hit the jackpot. Now, in the Gerstmann and MacDonald collections, you may see several large crystals, 2" to 3" in diameter by 12" to 15" long, of light blue green apatite from this location. Smaller crystals of good quality have also been found in this deposit. The small (1/16" x 1/4") blue green crystals of apatite frequently found in the Franklin limestone are sometimes seen in mine material.

Aragonite

Crystal specimens of aragonite have been consistently found at Sterling Hill. The Mud Zone yields excellent micro material. But the best source has been a chimney or fissure adjacent to the hanging wall on the upper levels, which is occasionally revealed by ore blasting operations. This Spring such a blast revealed a chamber, about 5' wide by 6' high, completely covered with rosettes of acicular aragonite crystals, up to 2" long. Large pieces of such material may be seen in several collections. Slender tapering crystals are the general habit, whether micro or large size

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crystals. Unfortunately, the appearance of most specimens is marred by surface coatings or inclusions of clays or manganese oxides. Most of these crystal specimens fluoresce a bright blue white, both short wave and long wave. An early find, October 1962, shows aragonite as a tan drusy crystalline coating, 1/8" thick, on calcite. The aragonite fluoresces a bright cream and the specimen is spectacular under the ultra violet light.

Arsenolite

Another rare species for the locality. It has been found as a powdery white alteration product of lollingite. A specimen may be seen in the Franklin Mineral Museum.

Axinite

Although common at Franklin, axinite is rare at Sterling Hill. A specimen, on exhibit at the F.M.M., from the 1600' level shows massive and crystallized yellow mangan-axinite similar to Franklin material.

Azurite

This species is found in the Intermediate Zone associated with malachite and other copper alteration products on a calcite/franklinite matrix. It is usually found as small blebs, about 1/4" in diameter, but occasionally these are massed to form a larger deep blue area. In vuggy material, small clusters of micro crystals may be found although these are usually covered in whole or in part by a brownish rhodocrosite.

Biotite

Biotite is common at Sterling Hill. Occasionally good crystal groups are available. Several specimens are on display at the F. M. M. The best contains a number of sharp crystals, up to 3/4" long by 1/2" diameter, associated with black willemite, gray dolomite and green antigorite.

Brandtite

Another rarity for Sterling Hill. The only specimen is in the Gerstmann collection. The matrix is a light pink friedelite with vuggy areas on the surface. In several of these vugs, the final deposition is brandtite in radiate groups of white micro crystals.

Brucite variety Manganbrucite

This rare mineral has been identified at Sterling Hill in three specimens, all of typical North Ore Body material. The manganbrucite occurs in small areas, 1/8" to 1/4" wide, as a glassy, yellow, platy material. A specimen is on display at the F. M. M.

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Calcite

White calcite is the principal matrix mineral at Sterling Hill and may be seen in almost every specimen. Most of the massive material contains manganese and fluoresces a bright red, both short wave and long wave. A few pieces, light pink in color, fluoresce a dull blue, short wave. A cream or yellow calcite contains areas, probably admixed with another mineral, that fluoresces a vivid yellow, short wave. These require more identification work.

Good crystal specimens, particularly of micro material, have been readily available. Most of these come from the Mud Zone or the adjacent area. In such material, the matrix is a vuggy franklinite or manganese oxide, and the calcite occurs as micro crystals either tabular or of the dog tooth variety. In seams, calcite crystals are larger and range in size from 1/4" to 3/4" across; these are usually colorless rather than white and in simple rhombs. Crystal specimens from this area are subject to the same surface blemishes as the aragonite crystals. From other areas, calcite crystals are much less common and are found only as drusy coatings of micro crystals.

Calciozincite, not a species but a mixture of calcite and zincite, is readily available. This material makes attractive specimens with its columnar structure and bright orange color.

Celestite

In April 1965, a few specimens from the Intermediate Zone, 500 ft. level, were found to contain micro crystals of celestite. The matrix is the vuggy calcite/franklinite. The celestite crystals are found in the vugs, associated with and sometimes perched on calcite crystals. The celestite crystals are micro size, colorless, prismatic with pyramidal terminations. They are not discolored so their origin may be comparatively recent.

Chalcophanite

Frequently found in Mud Zone material. The most attractive specimens are silver or bronze sprays and rosettes, micro size, associated with micro aragonite crystals.

Chloropal variety Nontronite

This yellow clay is frequently found in Mud Zone specimens.

Chlorophoenicite

Rare at Sterling Hill. Several specimens recently available probably came from an old collection, in an occurrence not recorded in Palache. The chlorophoenicite is found in radiate aggregates of acicular micro crystals on and with fine needle crystals, also micro size, of a tan willemite forming a crust on troostite like massive ore. Similar type micro crystals in vugs of North Ore Body material may prove to be chlorophoenicite.

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Chrysocolla

Chrysocolla has been identified as one of the copper alteration products in specimens from the Intermediate Zone. Like azurite, it is found in small blebs or areas, light to dark blue, cryptocrystalline.

Chrysotile

Fibrous serpentines at Sterling Hill are quite common and most of them should be chrysotile. The brown horny variety called "Vor hauserite" is also frequently found. Much research work is needed on the Sterling Hill serpentines.

Covellite

Another discovery in copper minerals from the Intermediate Zone. Covellite has been found in very small areas as deep blue metallic plates. Verified specimens have been few so far.

Feitknechtite

This newly discovered manganese oxide is one of the minerals in the mixture previously called hydrohausmannite. It is common in Mude Zone specimens.

Fluoborite

Fairly common at Sterling Hill but only in small areas or masses. The best specimens found recently contain small amounts of fluoborite in vugs and crevices, usually associated with calcite crystals, on ore.

Fluorite

Fluorite is common in the hanging wall on the upper levels. Late in 1964, attractive specimens of purple fluorite as veins, up to 2" thick, were brought up. Specimens of the variety "chlorophane" as pink to red masses in calcite are occasionally available; but as a rule specimen material is rarely seen.

Franklinite

Franklinite is the major ore mineral at Sterling Hill and is found throughout the mine in irregular masses. Sharp, well formed crystals, of any size, are rare. Some crystal specimens of less perfection are found and are worthy of note. In the Mud Zone, single crystals of all sizes, up to 2" per face, are regularly found. These are usually octahedrons, with rounded edges, dissolved in spots and partially covered with manganese oxides. During the 1966 F.O.M.S. field trip to the Open Cuts, the major portion of a large franklinite crystal with 4" faces was found. The hanging wall of the black willemite zone has also yielded good crystal specimens with dodecahedral faces, up to 1" in size. The uraninite crystal was found in this type material.

Friedelite

Attractive friedelite specimens in quantity came to the surface late in 1963, but since then good material has been scarce. Friedelite is most frequently found as veins, 1/4" to 3/4" wide, in ore; wider veins are infrequent. The color ranges from light to dark pink, red and brown. The vein material is cryptocrystalline; micro crystals are found in crusts or small vugs. Sometimes a surface will glisten with cleavage planes. Two specimens deserve mention. In one, superb

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single and twin crystals of a transparent light brown have had room to develop in a fold of massive friedelite to a size much larger than the average micro crystal. In the crust of another specimen, red micro crystals occur in the rare acicular form shown in figure 135, Palache, page 89. Gem grade friedelite, so popular with the lapidarist, is always scarce.

Galena

No galena specimens of interest, such as crystals or partially altered, have been reported. The few pieces seen contain only small masses of galena with bright cleavage surfaces.

Garnet

Garnet is much scarcer at Sterling Hill than it was at Franklin. No crystal specimens have been reported and the only noteworthy occurrence is on the 430 ft. level. Here, in an area about 5 ft. square, a very bright red garnet, that can easily be taken for zincite, is found in calcite associated with purple fluorite and black willemite. Analyses of this material showed it to fall in the spessartite-almandite series.

Gold

Early in 1965, two specimens of native gold were found in material from the Intermediate Zone, 500 ft. level. The matrix was calcite/xlzd. franklinite, with azurite, malachite and brown rhodochrosite. The gold was found as thin films between Franklinite crystals and the enclosing calcite. The amounts were minute. One shell has been made into a micromount.

Graphite

Flakes and small masses of graphite in calcite are sometimes found in specimens from the ore body. Small crystals can probably be leached out with acids from such material.

Gypsum

Gypsum is not often found at Sterling Hill but nobody cares. Specimens do come from the Mud Zone but the gypsum occurs in small masses and is unattractive. It would seem that selenite crystals should occur in the vuggy Mud Zone material, but no occurrence has been reported.

Halloysite

This is another clay mineral found in Mud Zone specimens.

Hausmannite

Common in specimen material from the North Ore Body. It occurs massive, dark brown in color, drab and undistinguished.

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Hematite

Hematite from Sterling Hill is usually found massive, no crystal specimens have been reported. Color is black but occasionally a peculiar red or dull steel gray material is found. The unusual cubic cleavage material has also not been reported or seen. In some areas, hematite will color massive calcite a light to dark red.

Hemimorphite

Very common in Mud Zone material; the quality, however, does not approach the old material from the surface open cuts. The crystals are usually small, often drusy and admixed with limonite in a porous structure. The more attractive specimens are of small rosettes of colorless to white micro crystals, free of limonite stains.

Hydrozincite

Hydrozincite is most often found as a powdery coating on zincite. A few specimens, from the Mud Zone, contain hydrozincite as crumbly, pulverent white masses, which must be protected from further deterioration.

Jeffersonite

Good specimens of jeffersonite crystals continue to be found on F.O.M.S. field trips to the Open Cuts. However, no specimens from the mine itself have been seen or reported.

Kaolinite

A final alteration product found in the Mud Zone. It is a light, porous residue, muddy white or yellow stained in appearance.

Kutnahorite

Kutnahorite has been confirmed in Sterling Hill material but so has pink calcite and rhodocrosite. Any of these species may form the matrix for troostite and franklinite, crystals or massive. A collector cannot distinguish between these species since he does not know the manganese content of a specimen. However, kutnahorite does not show incipient rhombohedral cleavage and appears more dense than the others. Regardless of species, the bright pink minerals provide a most attractive background for their companion minerals.

Limonite

No specimens of limonite from the ore body are on display. However, any collector can find this material freely on any F.O.M.S. field trip to the Open Cuts.

Lollingite

Lollingite is frequently found at Sterling Hill. The specimens are crystal forms associated with sphalerite and black willemite. The crystals are a bright silvery gray with sharp outlines, and occur up to 3" long. Whole crystals are scarce; cleavage sections are the rule due to the brittle nature of this material. Massive material is also found.

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Magnesium Chlorophoenicite

One of the more important finds at Sterling Hill was made in October 1963 in North Ore Body material from the 2350 ft. level. Fibrous snow white magnesium chlorophoenicite was found in compact little rosettes on the surface and in the crevices of brown willemite ore. In the finest specimens, the little rosettes were clumped up into areas up to 1-1/2" in diameter. A limited number of pieces were found; these occurred in a slip in the ore body, which may be hit again.

Malachite

Another of the copper alteration products found in the Intermediate Zone material. It occurs in small masses, thin coatings or as a coloring agent in the associated calcite. I have seen only one micro crystal. This is in the MacDonald collection and shows a single azurite crystal altering to malachite.

Manganpyrosmalite

This massive dark brown member of the friedelite family has been verified in several specimens. Because it resembles serpentine, hausmannite and other dark brown minerals, it may be more common than the number of verified specimens would indicate.

Marcasite

Specimens are only occasionally seen as small, unattractive masses. Since there is nothing unusual about such material, few specimens are brought to the surface.

Melanterite

Another white, powdery alteration product. A specimen under glass at the F. M. M. shows marcasite altering to melanterite.

Mooreite

Once scarce at Sterling Hill, mooreite is now freely available. In the usual specimen, the mooreite occurs as colorless to white coatings on slip or fracture faces of brown willemite ore from the North Ore Body. When there has been room to develop, such coatings are crystallized and often show good micro crystals. The large crystals of the original Sterling Hill find have not been seen. Mooreite has also been found in a butterscotch color. While all identifications to date have been made of surface coatings, areas of what seems to be massive mooreite are found in other North Ore Body specimens. These need verification.

Phlogopite

Another mineral that is rarely brought to the surface although probably common below. In the Franklin Mineral Museum, a good crystal group may be seen; the largest crystal is about 3" in diameter by 5" long. Another interesting piece shows phlogopite altered and altering to a dark brown serpentine.

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Pyrite

No unusual specimens of pyrite have come to my attention. The most interesting has been areas of massive pyrite in a red to brown calcite that has been stained by hematite.

Pyroaurite

This new mineral for Sterling Hill was validated late in 1965. The pyroaurite has been found as micro butterscotch colored hexagonal crystals associated with micro crystals of mooreite on surface coatings of brown willemite ore from the 2350 ft. level of the North Ore Body. So far it is scarce.

Pyrochroite

Pyrochroite is abundant in North Ore Body material as dull black earthy to solid masses and coatings. In November 1964, crystal specimens from the 2350 ft. level aroused considerable interest. The crystals were sky blue in color, 1/8" to 1/4" long, and sharp in outline. Because they did not darken quickly, there was considerable speculation as to their identity and some claims were made for torreyite. Chemical analyses by Alex Knoll showed manganese present but the blue color remained bright and clear. However, in June 1965, a reinspection of these specimens revealed they were darkening and today these crystals are a glittering black, and unquestionably pyrochroite. Only a few specimens were available from this occurrence but there is always the possibility that more may be found.

Pyrosmalite

This iron rich member of the friedelite family is definitely found at Sterling Hill. However, since it cannot visually be distinguished from friedelite, it is rarely correctly identified by the collector.

Pyrrhotite

Another mineral that rarely is brought to the surface although common for the location. An occurrence of massive streaks in a light green feldspar is occasionally available. Small iridescent masses are sometimes seen in gangue material.

Quartz

Quartz specimens from Sterling Hill are rarely seen and then only in crystals and not massive. Drusy micro crystals coating seams or pockets in ore from the upper levels are sometimes offered. Recently a few pieces of rose colored micro crystals on ore were found. The best of these specimens may be seen at the Franklin Mineral Museum.

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Rhodocrosite

Massive rhodocrosite is very common at Sterling Hill. The most unusual material is the mustard colored rhodocrosite associated with the copper alteration minerals of the Intermediate Zone. The most attractive is the bright pink that cannot be distinguished from kutnahorite. No occurrence of rhodocrosite crystals has been reported or seen.

Rhodonite

The rhodonite from Sterling Hill does not compare with that from Franklin. It is nowhere near as abundant, is usually grainy rather than massive and a light pink in color. When found as veins or in larger masses, the color is heightened and appearance is more attractive. A few pieces of a raspberry red rhodonite, similar to the Australian Broken Hill material, have been found. No crystal specimens have been seen or reported.

Sphalerite

This interesting material is common at Sterling Hill and specimen material is always in demand. The most interesting specimens are of the "cleiophane" variety. The small to large masses of glittering, resinous, silvery white sphalerite offer a very pleasing contrast to brown willemite and white calcite. The fluorescent response to both short wave and long wave is also spectacular - salmon pink to orange. The same fluorescent response is produced by a distinctive brick red sphalerite which is peculiar to Sterling Hill. This material bears a small percentage of cadmium, Sphalerite is also found in other colors ranging from light to dark browns and a deep gray. It occurs in grains, veins and massive; no crystal specimens have been seen.

Sussexite

One of the surprises since the mine reopening because of the large quantities found in the North Ore Body. Here it occurs, when unaltered, in small to medium size masses, light violet to deep lilac in color, cherty or cryptocrystalline in appearance. A few specimens show crystal outlines and cleavage surfaces, often in a semi rosette pattern. These are distinctive because of the contrast offered by a light interior color and a darker outside color. The most interesting specimens show the three stages or appearances of this mineral. The original material is a bright violet cherty - this changes to a dirty gray white but still solid - final state is a gray white fibrous, which is frequently stained by associated pyrochroite.

Talc

Talc is frequently found as an alteration product of other minerals in specimens from the upper levels. One interesting piece contains light green grains in dolomite - now talc, previously willemite.

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Tephroite

Fine specimens of a brownish columnar tephroite in pink calcite have recently been found on the 500 ft. to 700 ft. levels. This material,called tephrowillemite locally, makes very fine fluorescent specimens due to the willemite interlining the tephroite. Crystal cleavages are common; whole crystals are scarce. Crystals range in size from 1" to 3" in diameter by 2" to 6" long.

Todorokite

Todorokite is found in the Mud Zone material. It forms small hemispheres, 1/4" to 1/2" in diameter, which, when cleaved, reveal radiating crystals. Color is dark brown to black.

Torreyite

No substantiated finds of torreyite have been made although some specimens have been so marked. See pyrochroite for the cause of confusion on this species.

Tremolite

Tremolite, particularly asbestos, is found at Sterling Hill but no recent specimens have come to my attention,

Uraninite

Nine months have gone by since the discovery of the single uraninite crystal and no other find has been reported. The lone find was a cubic crystal, about 1/2" per face, in calcite associated with franklinite and willemite from the 700 ft. level.

Wad

When a mixture of manganese oxides from the Mud Zone is undistinguished and unknown, the owner labels the specimen "Wad". There are many such specimens around.

Willemite

Of the major ore minerals at Sterling Hill, willemite is the species that has consistently produced good and interesting specimens for both the collector and mineralogist. Crystals, micro size to 3" long, have been found of brown willemite, black willemite and troostite. Fibrous white willemite has been found on crusts and in veins. Light green willemite veins cut massive brown willemite ore. In the Mud Zone, willemite in various stages of alteration is readily found. Material from other areas altering to talc and serpentine is often seen. The most attractive specimens are of medium size troostite crystals in pink calcite or kutnahorite from the 700 and 800 ft. levels.

Wollastonite

Wollastonite has been found in Sterling Hill as columnar prismatic white crystals, up to 1" long, associated with tan fluorite and a green pyroxene. It is non fluorescent. I have seen only three specimens but it may be more plentiful.

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Zincite

Zincite is common at Sterling Hill but unusual or good specimens are scarce. Palache's corroded crystals still come up from the 700 ft. level. Recrystallized orange zincite is common in North Ore Body specimens. Some interesting specimens contain zincite in differing shades of red and orange. One surprise has been the identification of a dark brown massive mineral in North Ore Body material, commonly called hausmannite, which proved to be a mixture heavy to zincite. The best crystal specimen found during this period is in the Gerstmann collection. While small (about 1/4" tall) the zincite crystal is beautifully formed - a bright red pyramid with pedion.

MINERALS PREVIOUSLY REPORTED FROM STERLING HILL BUT NOT DISCUSSED IN THIS REPORT

Actinolite (c)
Allactite (b)
Anglesite (c)
Anthophyllite (c)
Arsenic (b)
Arsenopyrite (c)
Aurichalcite (b)
Barite (c)
Birnessite (c)
Cerrusite (b)
Chalcopyrite (c)
Corondum (b)
Cryptomelane (c)
Descloizite (b)
Diopside (a)
Dolomite (a)
Edenite (a)
Epidote (a)
Fosterite (c)
Gahnite (a)
Goethite (a)
Hastingsite (c)
Hetaerolite (c)
Heulandite (b)
Hexahydrite (a)
Hornblende (a)
Hydrohetaerolite (c)
Ilmenite (b)
Leucaugite (c)
Magnatite (c)
Magnussonite (b)
Manganite (c)
McGovernite (b)
Muscovite (a)
Orpiment (b)
Psilomelane (c)
Pyrolusite (c)
Realgar (b)
Riebeckite (c)
Roepperite (a)
Rutile (c)
Scapolite (a)
Schefferite (c)
Siderite (c)
Sillimanite (c)
Smithsonite (c)
Spinel (a)
Stilbite (b)
Tennanite (b)
Titanite (c)
Tourmaline (c)
Vredenbergite (c)
Woodruffite (c)
Wurtzite (b)

(a) - Common at Sterling Hill; unquestionably present but no specimens have come to my attention.

(b) - Rare for Sterling Hill; almost certainly not found during this period.

(c) - Not common; may have been found but not seen or identified.

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