

THE PICKING TABLE



Inside the Franklin Power House, circa 1940

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Journal of the Franklin-Ogdensburg
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ABOUT THE COVER PHOTOGRAPH

This is an inside view of the Franklin Power House as it appeared circa 1940. The Franklin Power House generated all the electricity for the Franklin Mill, the Franklin Mine, the town of Franklin, and the mine at Sterling Hill and its Mill. Jack Baum remembers that electric clocks were not very reliable in the Franklin area in those days. It is easy to understand why.

Minerals of the Franklin Quarry

Philip P. Betancourt
410 Chester Avenue
Moorestown, New Jersey 08057

INTRODUCTION

Among the various quarries in the vicinity of Franklin and Sterling Hill, New Jersey, the most productive in recent years has been the Limestone Products Corporation Franklin Quarry (formerly called the Farber Quarry, and before that known as the Moses Bigelow Quarry). The quarry is situated in the Franklin Marble on Cork Hill Road between Franklin and Ogdensburg, about 3/4 mile NNE of the Sterling Mine, in Sussex County, New Jersey. The Limestone Products Corporation has quarried white marble for use in a variety of ways, mostly to make decorative gravel for driveways and landscaping and to produce lime for agriculture. The quarry is of particular interest to both mineral collectors and scientists for several reasons, not the least of which is the generous way its management personnel have allowed periodic collecting in recent years by the Franklin-Ogdensburg Mineralogical Society. The specimens collected as a result of this policy provide the most complete record available for the minerals found within the Franklin Marble in the vicinity of the ore bodies at the Franklin and Sterling Mines.

The Franklin Marble is a crystalline, fine to course-grained metamorphosed limestone (Spencer *et al.*, 1908; Hague *et al.*, 1956: 437-441; Frondel and Baum, 1974: 163). Its color is most often white, but it can vary from snowy white to gray, tan, brown, or even pale orange or pink. The composition is also variable, from impure calcite to calcic dolomite. Dating from Precambrian times, the marble belt stretches from Orange County, New York, to south of Ogdensburg, in Sussex County, New Jersey, a distance of over twenty miles. Within this distance it includes a number of discontinuous lenses of gneiss and granite (often pegmatitic). The marble is also the enclosing host for the Franklin-Sterling Hill

ore body with its complex mineralization.

A sample of the marble in the Franklin Quarry was collected by the United States Department of Agriculture in June of 1954; a chemical analysis of this sample, previously unpublished, is included here as Table I. The sample is dolomitic calcite, with traces of a number of different elements.

TABLE I. Chemical analysis of Franklin Marble, 1954, a channel sample across the face of the Franklin Quarry, by the U.S.D.A. Agriculture Research Service, by courtesy of Mark Germaine and the N.J. Geological Survey.

Composition	Per Cent
Calcium carbonate	66.72
Magnesium carbonate	30.20
Phosphorus	.00072
Potassium	.0430
Sodium	.0180
Aluminum	.0935
Iron	.6900
Manganese	.1250
Copper	.0011
Molybdenum	.00002
Boron	.0007
Vanadium	none detected (less than .0005%)
Cobalt	none detected (less than .0005%)
Zinc	none detected (probably very much less than .0250%)

The purpose of this report is to present a species list for the area within the marble worked by the Franklin Quarry, as of May 1, 1986 (See Table II). This area provides a "window" into the enclosing host of the Franklin ore body. Since most of the collecting in the quarry has been done from loose blocks of stone lying on the quarry floor, information on the mode of occurrence of the finds reported here is seldom available. All that is known is what can be learned from the study of hand specimens.

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Figure 1. Aerial view of the Franklin Quarry, winter, 1985. The entrance is left of center at top of photograph. The north end of the quarry is at the left. For scale, note the automobiles parked at the center of the quarry. Photo by Bernard Kozykowski.



Figure 2. The north end of the Franklin Quarry, winter, 1986, while blasting. This photo cannot be reproduced without written permission from Charles Puzio.

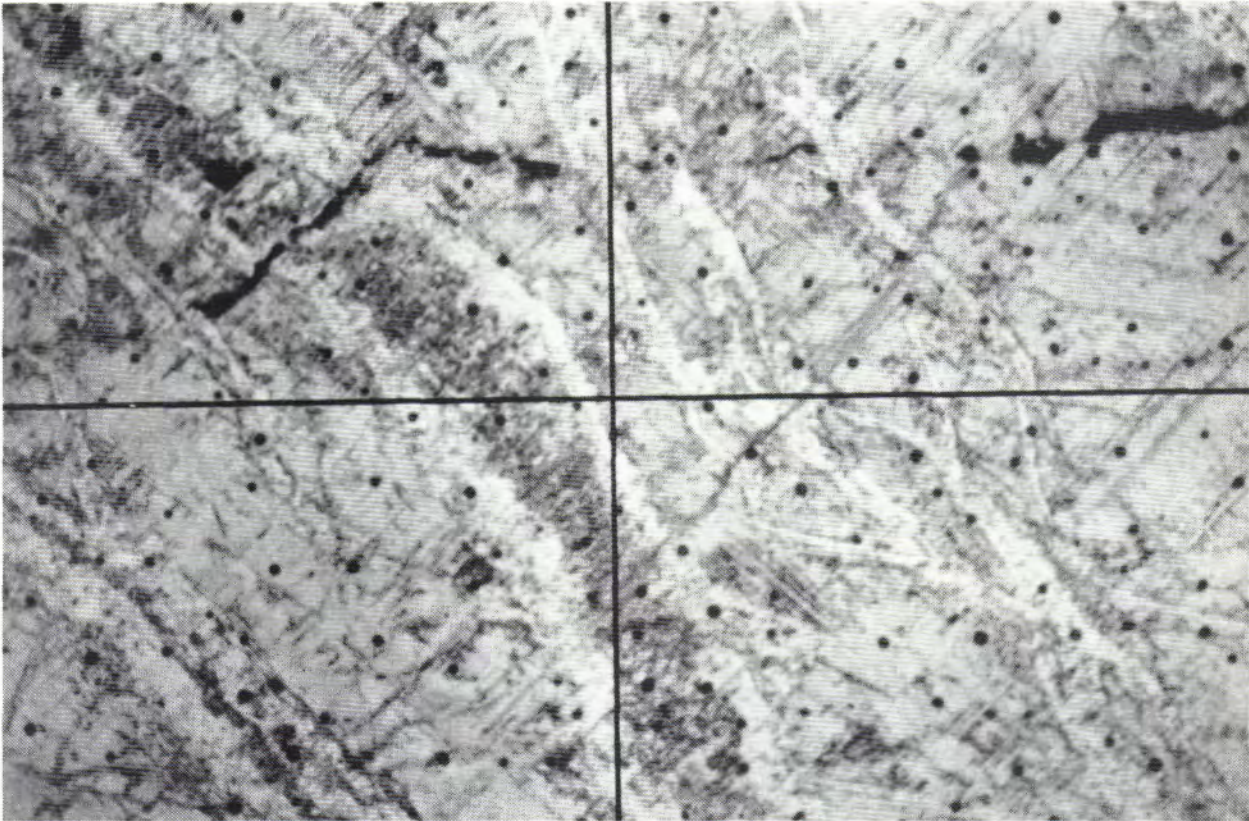


Figure 3. Photomicrograph of a feldspar from the Franklin Quarry. The diagonal lines are twinning in the microcline. The white veins are albite. Photo by George Myer.

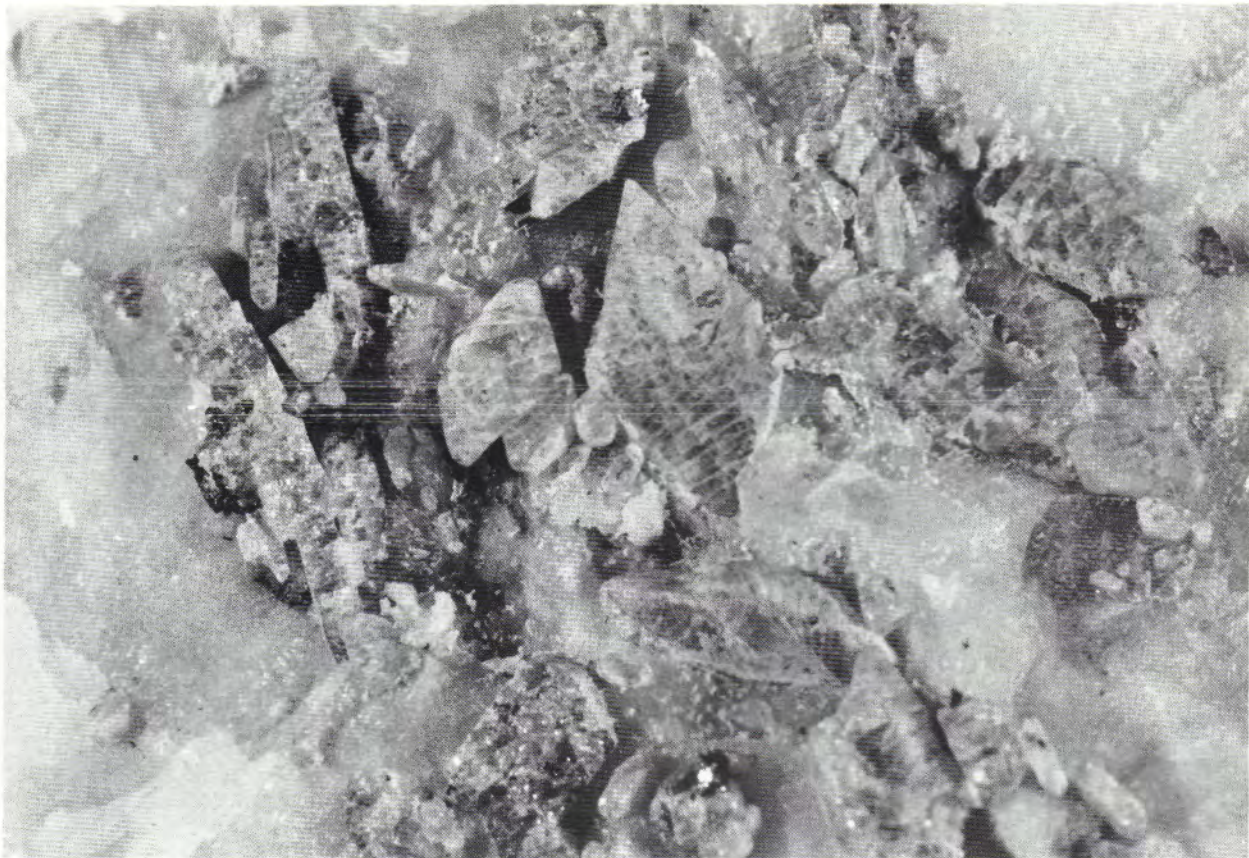


Figure 4. Crystals of norbergite or chondrodite from the Franklin Quarry. Collection of S. Sanford. Photograph by P. Betancourt.

Albite

Loose blocks of a white pegmatite composed mostly of feldspar, quartz, and phlogopite mica were visible in 1980 in the area just to the right of the main gate (Betancourt, 1983). Microcline was the most common constituent of the feldspar, but albite was visible in thin sections, intergrown with microcline. The feldspar was white with a fairly bright red-violet fluorescence under short-wave ultraviolet (SW). It occurred as cleavages up to over 10 cm. across, sometimes clean but occasionally fractured and discolored by pyrite and iron oxides or hydroxides. A vein of phlogopite mica was found at the contact between the pegmatite and the Franklin Marble.

Aragonite

Radiating sprays of white aragonite crystals up to one mm. long were found in 1985 by Charles Puzio, in vugs in the marble. The aragonite fluoresces white (SW).

Arsenopyrite

Arsenopyrite has been reported many times, as masses or tabular crystals in the marble, and the mineral may be fairly common. The only verified occurrence is as crystals in scapolite, from the north part of the quarry.

Azurite

Blue masses and stains have occasionally been found in seams and cracks in the marble. Several specimens with tiny crystals, identified as azurite by their morphology and their effervescence in hydrochloric acid, were collected at the north wall of the quarry in 1984.

Calcite

The Franklin Marble is mostly calcite. Vugs with good crystals are found occasionally in the north part of the quarry, with crystals of fluorite or quartz on the calcite, or with flakes of graphite embedded in the surface of the crystals. In April of 1984 several tons of recently quarried marble had a reddish discoloration like that of the Mn-rich marble from the vicinity of the ore bodies, but with the color in patches instead of being evenly distributed. This material has an even, red fluorescence (SW), similar to that of the marble found near the Franklin-Sterling Hill ore bodies, but with a slightly less intense response.

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Secondary crusts, coatings, and masses of calcite are common in the quarry, occurring in seams and vugs. They usually fluoresce either very pale brown or white (SW). One find of calcite crusts from the north part of the quarry, collected by Steve Misiur, fluoresces green (SW).

Chondrodite

See comments under norbergite.

Chlorite Group (near clinocllore)

A replacement of fluorine-rich phlogopite by chlorite has been noted on a specimen of margarite (Yau *et al.*, 1984). The chlorite, with a chemistry near clinocllore, occurred as thin layers interlayered with the phlogopite.

Corundum

Corundum is uncommon in the quarry. It has been found as rough red to pink to colorless crystals and grains in the marble, associated with phlogopite, graphite, and with brown tourmaline, or norbergite and/or chondrodite. Locally, the color grades to violet. Sometimes the grains are fluorescent cherry red (LW), with a response similar to that of other corundum from the Franklin Marble. The occurrences may be compared with a number of similar corundum finds reported by Palache (1935: 40-41); isolated concentrations of corundum occur in the marble all the way from the Lime Crest Quarry northwest of Sparta to Franklin.

Dolomite

Locally, the Franklin Marble contains enough magnesium to be dolomite (Hague *et al.*, 1956: 437-441; Yau *et al.*, 1984: 300-301). Gray-brown simple rhombic crystals in the Fred Parker collection may be dolomite, but have not been analyzed.

Edenite

See comments under tremolite.

Fluoborite

Masses which fluoresce bright very pale brown (SW) but are almost the same color as their marble matrix in daylight have been identified as fluoborite. Several finds have been made since the first discovery of the mineral in 1983 by Richard Bostwick, and it is possible

the species is fairly common in the quarry but has been overlooked by collectors until recently because of the difficulty of recognizing it in daylight. All the finds are similar, with the fluorite occurring as small masses in the marble, associated with graphite flecks and grains of dark brown norbergite or chondrodite.

Apatite Group (fluorapatite?)

Pale blue prismatic crystals are probably fluorapatite but have not been analyzed. No fluorescence is visible. The mineral is extremely rare.

Fluorite

Bright violet fluorite is common in the quarry. It occurs as masses and lenses up to over a meter across, and as thin fillings in slips in the marble. Cubic crystals up to 1 cm. across have been found on calcite crystals in vugs, associated with tiny euhedral quartz crystals, especially in a porous marble in the north part of the quarry. Rarely, the cube is modified by the octahedron. The euhedral fluorite crystals are a pale violet color. Masses of colorless fluorite have also been reported (Palache, 1935: 116).

Galena

Two separate finds of galena are known, both from the north part of the quarry. Gray metallic cleavages from a 1980 find were associated with sphalerite and other sulfides. Masses and cleavages also occurred in highly altered marble, filled with seams and vugs containing tiny calcite crystals, discovered in November of 1983.

Goethite

Amorphous iron alteration products are common in the altered portions of the marble. They were also present in the pegmatite visible in 1980 (Betancourt, 1983). Their brown color suggests goethite is the main constituent. Euhedral pseudomorphs of goethite (?) after pyrite pyritohedrons, perched on tiny calcite crystals, also occur locally.

Graphite

Hexagonal graphite plates under 1 mm. in diameter occur in the marble, and flecks, flakes, and masses of graphite are extremely common. Some of the graphite masses have

a radiating structure, but this feature is rare.

Hematite

Tiny black platy crystals have been identified as hematite. Red earthy coatings are not uncommon, and some may be hematite, but none has been analyzed.

Hercynite

Red translucent octahedral crystals up to 1.5 cm. in diameter were found in the north part of the quarry in June, 1983, associated with graphite, norbergite, or chondrodite crystals, and phlogopite crystals (Parker, 1983). Although most of the hercynite crystals were distorted or modified, a few were euhedral. Analysis by X-ray diffraction and EDAX has identified the iron aluminum spinel, hercynite. A few additional red octahedral crystals have been found more recently.

Magnesio-hornblende

See comments under tremolite.

Malachite

Green stains are found occasionally in different parts of the quarry. Alterations after azurite, from the north part of the quarry, are almost certainly malachite.

Marcasite

Small marcasite crystals were found by Will Shulman in 1977, associated with calcite crystals and pyrite (?). Analysis by X-ray diffraction confirms the identification. The species is also known from a pocket in the same marble about 1 mile NNE of the Franklin Quarry, discovered when the foundations for the iron furnace at Franklin were excavated (Palache, 1935: 40-41).

Margarite

Margarite has been found many times since the species was first discovered in the Franklin Quarry in 1981; all finds come from the north section of the quarry. The mineral occurs as flakes in the marble, with a color that varies from almost colorless to green or blue-green. Most specimens have a pale blue-green fluorescence (SW). From visual examination, the associated minerals appear to be similar for the different finds, but only the 1983 discovery has been studied in detail (Yau *et al.*, 1984).

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The margarite occurred as flakes disseminated in the marble, associated with phlogopite altering to chlorite, and with muscovite, titanite, rutile, quartz, graphite, and both calcite and dolomite. A specimen from this find analyzed by XRD by Mark Germiné (personal communication) included margarite, phlogopite, quartz, calcite, and dolomite. In addition, pyrite and rutile were identified visually. Abundant pyrite, possibly with other sulfides as well, was associated with the margarite found in 1981. The discoveries of margarite from the Franklin Quarry are quite different from a margarite assemblage from the marble wall rock in the Sterling Mine (Fronde! and Cook, 1971; Cook, 1973), as corundum and anorthite are common in that assemblage but have not been reported from the quarry finds.

Scapolite Group (meionite?)

Scapolite is fairly common, occurring as large gray to pale brown or violet masses. An analysis of a greenish specimen yielded an X-ray pattern near that of meionite.

Microcline

See comments under albite.

Muscovite

The only documented muscovite from the quarry is with phlogopite and margarite (Yau *et al.*, 1984). It is possible the muscovite formed by the alteration of feldspars or scapolite, but insufficient traces of the parent assemblage are present for its identification (Yau *et al.*, 1984: 299). Additional comments on the associations are given under margarite and clinocllore.

Norbergite

Charles Palache (1935: 102-103) described chondrodite and norbergite from the Nicoll and Fowler Quarries at Franklin, and his description is equally correct for the Franklin Quarry. The minerals are extremely common, as they are throughout the marble. They occur within the same almost colorless to dark brown grains disseminated in the rock or enriched into vein-like masses of grains. The two species are intimately associated, with chondrodite often forming the cores of norbergite grains (distinguished with thin section study). The grains may be quite large (a specimen in the collection of Richard Bostwick contains a grain with approximate dimensions 4 x 11

cm.). Yellow fluorescence (SW) is stronger in the pale varieties; rarely, a weak LW fluorescence is visible (Bostwick, 1977: 22-23). Imperfect crystals of norbergite or chondrodite were found in 1982, associated with hercynite and phlogopite crystals; the best specimens are in the collections of Stephen Sanford, Fred Parker, and the author.

Phlogopite

Phlogopite is extremely common throughout the Franklin Marble. At the Franklin Quarry, flakes and masses of a golden color have been found both in the marble matrix and in the pegmatite discovered in 1980 (Betancourt, 1983). Crystals over 5 cm. long are found occasionally in the north part of the quarry. One particularly interesting specimen consists of a phlogopite crystal (2 cm. diameter) completely enclosing hercynite crystals, from the hercynite find described above (author's collection, 5683). In 1910, the quarry yielded a find of well formed phlogopite crystals in a matrix of colorless fluorite (Palache, 1935: 116). Pale to bright yellow fluorescence (SW), particularly at the edges of the plates, is not uncommon.

Pyrite

Pyrite is common in the quarry. Grains, masses, and crystals (usually pyritohedrons, but also cubes, sometimes with octahedral modifications) are found in the marble. The mineral is also present in the white pegmatite (Betancourt, 1983). Palache (1935: 30-31) reports a variety of crystal forms from the nearby Fowler Quarry, but no detailed study of the pyrite from any of the other Franklin area quarries has been made.

Pyrrhotite

Masses and lenses of pyrrhotite have been found in the marble in the north part of the quarry. The mineral is rather common, and local concentrations are occasionally found, providing many masses in the same area.

Quartz

Many finds of quartz have been made, but the mineral is not really common. Milky masses occur in the marble; transparent crystals perch on calcite crystals in vugs containing fluorite crystals; crystals appear with dolomite; smoky to colorless masses occur in the pegmatite.

TABLE II. SPECIES FROM THE FRANKLIN QUARRY

<u>Confirmed Species</u>	<u>Method of Verification</u>	<u>Locations of Documented Specimens</u>
Albite	XRD and thin section (3)	PPB no. 4464
Aragonite	index of refraction (3)	PPB no. 6978; CP
Arsenopyrite	visual ID (xls)	FJP
Azurite	acid effervescence	FJP; JC
Calcite	XRD (2) & (3); electron probe (5)	MG; PPB; UM
Chlorite group (near clinocllore)	XRD & electron probe (5)	UM
Chondrodite	thin section (3)	TU
Corundum	visual ID & LW (xls)	RS; SM; PPB no. 6687
Dolomite	XRD (2); electron probe (5)	MG; UM
Edenite	XRD & EDAX (2)	MG
Fluorborite	XRD (1)	PPB no. 6141
Apatite group (fluorapatite?)	visual ID (xls)	FJP
Fluorite	visual ID (xls)	numerous
Galena	visual ID	FJP; PPB no. 6355
Goethite	visual ID	PPB nos. 6048 & 6366
Graphite	XRD (3)	PPB
Hematite	XRD (4)	FJP
Hercynite	XRD and EDAX (4)	FJP
Magnesio-hornblende	XRD and EDAX (2)	MG; RCB
Malachite	visual ID	numerous
Marcasite	XRD (4)	FJP; WS
Margarite	XRD (1),(2),(4) & (5); electron probe (5)	MG; FJP; UM
Scapolite group (meionite?)	XRD (4)	FJP
Microcline	XRD & thin section (3)	PPB no. 4464
Muscovite	electron probe (5)	UM
Norbergite	XRD (1); thin section (3)	TU
Phlogopite	XRD (2),(3) & (5); electron probe(5)	MG; PPB; UM
Pyrite	visual ID (xls)	numerous
Pyrrhotite	XRD (4)	FJP
Quartz	XRD (2) & (4)	MG; FJP
Rutile	XRD (4); optical studies (5)	FJP; UM
Sphalerite	atomic absorption (2)	MG
Spinel group (probably spinel)	visual ID (xls)	PPB no. 6054; SM
Talc	hardness	FJP
Titanite	optical studies & electron probe(5)	UM

TABLE II. SPECIES FROM THE FRANKLIN QUARRY (CONTINUED)

<u>Confirmed Species</u>	<u>Method of Verification</u>	<u>Locations of Documented Specimens</u>
Tremolite	XRD & EDAX (2)	MG
Tourmaline group (uvite &/or dravite)	visual ID (xls)	numerous

Key to Abbreviations

(1). P. J. Dunn, U. S. National Museum	MG	Mark Germiné collection
(2). M. Germiné, N. J. Geological Survey	PPB	Philip P. Betancourt collection
(3). G. H. Myer, Dept. of Geology, Temple Univ.	RCB	Richard C. Bostwick collection
(4). F. J. Parker	RS	Richard Stagl collection
(5). Y.-C. Yau <u>et al.</u> , Dept. of Geological Sciences, Univ. of Michigan	SM	Steve Misiur collection
CP	SW	Short wave ultraviolet
Charles Puzio collection	TU	Dept. of Geology, Temple University
EDAX Energy Dispersive X-ray Fluorescence	UM	Dept. of Geological Sciences, Univ. of Michigan
FJP Fred J. Parker collection	WS	Will Shulman collection
JC James Chenard collection	XRD	X-ray diffraction
LW Long wave ultraviolet		

Reported but Unconfirmed or Unanalyzed

Anorthite	Cerussite	Molybdenite
Barite	Cryptomelane	Pargasite
Bornite	Diopside	Schorl
Bulfonteinite	Greenockite	Wollastonite
Chalcopyrite	Lizardite	

Rutile

Palache (1935: 49) reports finds of rutile at several of the quarries and outcrops in the Franklin area. The only documented find of the mineral in the Franklin Quarry in recent years is in the margarite assemblage (Yau et al., 1984) where it occurs as tiny brown crystals.

Sphalerite

A rare mineral in the quarry, sphalerite was found as green to yellow to brown masses, rarely as fine crystals, from a sulfide area discovered in 1980 (Fred Parker collection). A specimen was analyzed by Mark Germiné (personal communication), using atomic

absorption. The analysis showed 56.8% zinc and 0.14% cadmium. Also present in this specimen were galena, chalcopyrite (?), bornite (?), and fluorite, all identified visually. Additional specimens were found by Charles Puzio and others in the winter of 1985-1986, as small yellow crystals in the marble, associated with graphite, phlogopite, and pyrite. A gemmy, pale yellow-green tetrahedron is in the collection of Steve Misiur.

Spinel Group (spinel?)

Brown, green, red, and blue octahedral crystals found in the marble are undoubtedly members of the spinel group. Only hercynite has been identified positively (see above), but spinel is probably also present. The mineral has

been recorded from a number of other localities within the Franklin Marble (Palache, 1935: 43).

Talc

Rare, small gray masses have been identified as talc by their hardness.

Titanite

Tiny amounts of titanite have been recognized from a margarite assemblage (Yau et al., 1984). The find is described under margarite and clinocllore.

Tremolite

Minerals in the amphibole group occur in the quarry as crystals, masses, and films in the marble, with a color varying from white to dark green. Prismatic crystals and crystal sections are common and may be up to over 5 cm. long. Often they have a pale blue-green to very pale brown fluorescence (SW) and a weak very pale brown fluorescence (LW) (Bostwick, 1977: 20). Seventeen specimens of amphiboles were analyzed by EDAX by Mark Germine (personal communication). He found that eleven of the specimens were tremolite, while the other six pieces included tremolitic hornblende, magnesio-hornblende, and edenite.

Tourmaline Group (uvite and/or dravite)

Sharp green or brown crystals of tourmaline occur in the marble, with sizes varying from microscopic to over 2 cm. in size. The crystals are similar to the tourmaline found in the other quarries in the vicinity of Franklin (Dunn et al., 1977: 104) and are probably uvite. Fluorescence is tan to pale yellow in some specimens (SW).

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Early Products of the New Jersey Zinc Co.

John L. Baum
70 Route 23N
Hamburg, New Jersey 07419

The New Jersey Zinc Company started life as a paint company, or at least as a manufacturer of paint pigments. Beginning with the construction of a smelter at Newark, New Jersey in 1848 to 1852, experiments were undertaken in efforts to produce commercial products from zincite and franklinite. Willemite was not known as an ore of zinc at that time and zinc metal was not commercially produced from Franklin area ores until after the Civil War. By 1852 the experiments had shown that pigments could be made by grinding the ore minerals. For many years paint pigment was thus processed in a plant near Franklin Pond and the large barn-shaped wooden building shows in old photographs of that area. The accepted color for barns and other outbuildings was red because the cheapest pigment available was made from burned iron oxides and franklinite served the purpose well.

Shuster's Historical Notes of the Iron and Zinc Industry in Sussex County, New Jersey relates that Dr. Samuel Fowler's home was painted with a bluish-white paint in about 1830. Because we are interested in getting the story of Franklin from those who were there, what is recounted here is from the original report of the New Jersey Zinc Company for 1852. Dr. Sam's paint was actually made by George Ballou, a New Englander who came to Franklin to attempt to produce metallic zinc from the local ore. Ballou, and we quote, "devoted much time and labor in his attempts to obtain zinc in its metallic state from these ores, and appears to have been the first one who ever devised any mode for working the zinc upon a plan different from that adapted in Europe. The exhaustion of his limited means and failure of his health were causes that compelled him reluctantly to abandon a scheme he had cherished with an enthusiasm that had rendered him sanguine of success. One result, however, was obtained by him; while working for metal, a sub-oxide or bluish-white powder was collected, ground in oil, and used as a pigment upon the mansion of Dr. Fowler at

Franklin. This was probably the first application of zinc paint in this country, and preceded by several years the brilliant discoveries of LeClaire and Sorel in Europe, which were deemed of so much importance, that they were rewarded by large pecuniary advantages, and were created Knights of the Legion of Honor."

These experiments were refined and expanded by the infant Zinc Company until it could produce in 1852 not only pulverized ore as a pigment, but an excellent grade of zinc oxide and an alloy of manganese iron, all from the same red and black mixture which Lord Stirling had sent to Swansea, Wales some seventy-five years earlier to no avail in the belief that it was a rich copper ore. In addition, the American process of zinc oxide manufacture was more economical than the French. Recognition of zinc oxide as a pigment superior to lead on many counts was earlier the cause of the awards to LeClaire and Sorel in France, but now for the first time the product was available cheaply in America. The only problem was that painters were not accustomed to using it. Testimonials valuable to the Company were sought and obtained. The Supervisor of the New York and New Haven Railroad had been using lead paint and as early as the summer of 1850 painted station-houses with zinc paint manufactured by the New Jersey Zinc Company on an experimental basis. He reported on March 27, 1852 that on examination the buildings painted with zinc paint looked as well as when first painted while those painted with lead had been much affected by the atmosphere, being rubbed off in part, and altogether chalky. Besides, it took more lead to cover the surface. The Zinc Company, we may be sure, was pleased to learn that Supervisor Sanborn would use zinc paint in all cases thereafter. One James Jarvis, a test engineer with a Navy Yard in Virginia reported that the Company's zinc oxide, brown pigment and black pigment were in varying degree effective in the control of barnacles, the zinc oxide

and brown pigment being even more effective in this regard than red lead. He added that the foreman of painters in the Yard found zinc oxide far preferable to white lead.

A report of a Special Committee of the New York City Board of Assistant Aldermen offered a resolution which was adopted by the Board of Assistants May 3, 1852, by the Board of Aldermen October 18, 1852, and approved by the Mayor October 19, 1852 as follows: "Resolved, that it be recommended to the Commissioner of Repairs and Supplies, and to all other officers and agents of the City, who have occasion to use paints upon its property, to employ zinc, especially upon roofs, iron work, and in places exposed to impure air." Had every painter in the city read and heeded the report of the Special Committee, much grief would have been avoided. We quote from the report: "So far as health is concerned, either of the public at large, or of a large class of our fellow citizens, it is doubtless a proper subject for our consideration. That lead is poisonous, is notorious. That its use is often attended with the most melancholy consequences we believe to be indisputable. It is said the number of painters, including apprentices, journeymen, and master-painters,

actually employed in the city of New York exceeds four thousand. To some, the occupation proves fatal — to most, injurious. One witness, a practical painter, says 'Few painters, who work steadily at the business, are not broken down in their constitutions before they are forty years old.' Some abandon their occupation on account of its unhealthiness, and become unsettled; some, who have families, are compelled, for the support of those who are dear to them, to persevere to the death."

"If a sudden calamity, an explosion, or the falling of a house occurs, by which a large number of our citizens are killed or maimed, the whole city is shocked. If the accident is caused by reckless or criminal negligence, indignation justly mingles with our horror. Should our horror, at the dreadful result, be diminished, because it is produced gradually and imperceptibly?"

There is more to the report with its delightful Dickensian rhetoric, but the point has been made that in zinc pigment the fledgling New Jersey Zinc Company had a product that would flourish upon exposure, one that was clean, safe, economical, lasting, and a boon to mankind.

the President's Message

Trends

"No man is an island, entire of itself." The same is true of special-interest communities like the F.O.M.S. However much we pursue our own careers and collecting interests, larger events like wars and stock market crashes may have profound and far-reaching influences on our lives. Nowadays it is more fashionable and comforting to speak of societal trends rather than of disasters, but these trends affect us all. The most significant events of 1985 and 1986 for the Franklin-Sterling Hill collector community were direct results of such trends or symptoms of our time: Tax Law Changes, the Insurance Crisis, and the recession in U.S. basic industries.

The Spex-Gerstmann Collection stays at home

Changes in the way our government views donations to non-profit institutions undoubtedly influenced the disposition of the Spex-Gerstmann Mineral Collection at the end of 1985. That it went to the Franklin Mineral Museum at last, after years of rumors that it might end up almost anywhere else, from the basements of Trenton to the monied showcases in Texas, had very little to do with taxes and a great deal to do with the labor and wisdom of the Mitteldorfs, Ewald Gerstmann, Warren Miller, and the Franklin Mineral Museum Executive Board. They all are to be congratulated for keeping the world's best private collection of Franklin-Sterling Hill minerals where it

most obviously belongs: at home, and in context.

Liability Insurance: The Trotter Dump and the F.O.M.S.

No inhabitant of the Garden State is unaware of the Insurance Crisis. Here more than elsewhere, everyone with a grievance is looking for someone with money to sue, and premiums for everything have soared as a result. One direct result was the closing of the Trotter Mineral Dump at the end of the 1985 season. One suspects that the Trotter was never a major money-maker for its owner, Amos Philips, and we owe him a debt of gratitude for having kept this unique collecting site available for so many years. A less direct result was that the F.O.M.S. joined the Eastern Federation of Mineralogical and Lapidary Societies. In early 1985 the F.O.M.S. Board of Trustees decided that its members and the F.O.M.S. organization should be protected against liability that might be incurred during its public functions: meetings of various kinds, and most particularly field trips. On investigation, it turned out that liability insurance purchased locally cost as much as or more than E.F.M.L.S. membership plus the optional liability insurance. On reflection, it seems that the F.O.M.S. had nothing to lose by this transaction except its total exposure to liability suits, and its traditional isolation. The E.F.M.L.S. is an enormous resource of information and services not previously available to F.O.M.S. members, from educational pamphlets and slide shows to lapidary training camps, not to mention the opportunity to participate in regional and national mineral shows. While keeping up with Franklin is labor enough for some F.O.M.S. members, there can be no harm in extending one's horizons, and perhaps carrying the Franklin gospel to the heathen. Members who want to know what the E.F.M.L.S. can do for them, and vice versa, should contact The Picking Table's editor, Omer Dean, who has graciously agreed to act as our E.F.M.L.S. Information Broker.

Economics and Sterling Hill

Another closing, more expected than the Trotter Dump's but harder to accept, was that in March, 1986, of the Sterling Mine of the New Jersey Zinc Company. This shut-down was yet another symptom in the slump which has been affecting the U.S. metals and mining industry for several years now; copper, iron, and lead (to name three) have been doing as badly or worse. The

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Sterling Mine is being maintained on a standby basis, with the pumps running and a small maintenance crew on hand, waiting for the price of zinc to rise. Whether the mine will reopen is a matter of speculation. Although there is ore enough for several years at least, the definition of ore has an economic aspect; if you can't mine it at a profit, it ceases to be ore. Consider also the abrupt surge in Sussex County property values, with attending tax increases. I have heard it said that if the notorious "Lost Ore Body"—that undiscovered portion of the Sterling Hill body on the east side of the Zero Fault—were to be found tomorrow, that it could not be developed and mined at a profit.

When the Sterling Mine closes for good, it will mark the death of underground mining in New Jersey, a state which not so long ago was a major producer of zinc and iron, and whose landscape is riddled with mine and furnace sites. The Franklin Mine, forty years ago the major industrial force in Sussex County, is now two smokestacks, and a few dilapidated buildings scattered about an undeveloped chunk of prime real estate. To a mineral collector, Franklin is an idea: a gigantic edifice of dozens of mines and quarries, a hundred or so mineralogists and geologists, three hundred mineral species, seven hundred scientific articles and publications, thousands of miners and collectors, and hundreds of thousands of specimens scattered to the corners of the earth. Physically the Franklin Mine has been reduced to a crumbling eyesore. There is no reason why the Sterling Mine should not equal it in a dozen years, considering the rate of change in this state. If you have tears, prepare to shed them now.

A vision of 2009

If F.O.M.S. members had a dream of the future, it might resemble this: It is October, 2009, the fiftieth anniversary of the F.O.M.S., and the time of the fifty-third annual Franklin-Sterling Mineral Exhibit. This show has outgrown its original bounds, and attracts visitors from all over the country, and the world. Exhibits and dealers flourish in several locations, but the show revolves around the axis of the Wallkill River, with the Franklin Mineral Museum at the north, and to the south, the Sterling Mine.

The Franklin Mineral Museum has expanded greatly, and is now in effect an earth science

study center for northern New Jersey, with its collections, exhibits, library, and its many educational programs. The museum has now assembled the finest collection of Franklin-Sterling Hill minerals in existence; all together, in one place and on display, it has a stunning, cumulative impact, justifying Franklin's claim to be the foremost mineral locality in the world. For some, though, the real and unforgettable attraction will always be the trip underground in a working mine, at Sterling Hill. Now a part of a National Historical Site, the mine is kept operating by a combination of public and private funding, both as a tourist attraction and as a training center for mining engineers, mine safety inspectors, and the like. The mine tour begins in the old change house, where the history, equipment, and minerals of the Sterling Mine are all displayed. After visiting the hoist house and mill, tourists and students alike enter the adit, where they don hard hat and lamp, and ride the cage to one of the working levels, where one of the remaining portions of ore is being worked by a small, dedicated crew. There the visitors encounter the strange paraphernalia of mining: they hear of the skills and strength necessary underground, and watch while a hole is drilled, and loose rock scaled. They see the world's richest zinc ore in place: its colors, heft, and structure. At the tour's climax they come to a chamber where all cap lamps are turned off, and the walls and overhead are transformed to a brilliant tapestry of red and green by ultraviolet lamps. (It is said that even the most hardened mining engineer is not indifferent to this spectacle, the only one like it on earth.) This is more than a circus sideshow. It is a unique encounter, in a special place, with something real and fundamental: the earth.

You will say that such a vision is impractical, lopsided, or simply impossible. And yet there will not be one of you who does not hope that it might happen. All of us believe Franklin-Sterling Hill to be extraordinary and important; all of us know that its mineral knowledge and heritage deserve preservation. Perhaps it is time for more of us to think hard about how such things might come to be.

A vision of 1986

Do organizations exist to further such concerns? Of course. They include F.O.M.S. and the Franklin Mineral Museum. The F.O.M.S. is that very rare bird, a locality-oriented mineral

society, one not limited geographically in its membership, but dedicated (among other things) to circulating through its publication, this Picking Table, current and accurate information about the minerals and mines of Franklin and Sterling Hill. We also have seven meetings a year, and organize field trips to the still-active collecting sites in the Franklin area. So much for appearances; what of our aims? They are clearly set forth in the F.O.M.S. constitution, and are as sensible and clear-sighted as they were when they were drafted in 1959. Here are the first seven purposes of the F.O.M.S., from Article II:

1. To participate in the operation of a sound permanent museum for Franklin minerals in Franklin, New Jersey.

2. To collect and preserve mineralogical, geological, and historical knowledge relating to the Franklin-Sterling Hill ore deposits.

3. To develop new information on Franklin minerals and mineralogy through cooperative scientific programs with universities and other organizations and individuals.

4. To obtain and make available, in proper perspective, accurate information on Franklin minerals and mineralogy.

5. To facilitate collection of Franklin minerals while conserving material for future students and collections.

6. To facilitate identification of Franklin minerals.

7. To promote fellowship and the advancement of mineralogy and geology by providing meetings of those interested in the Franklin area.

We could do worse than continue the realization of our own stated aims.

The Franklin Mineral Museum is pursuing its own dream by planning a larger building, which is to include an auditorium and greatly increased exhibition space. As this is part of our vision also (see F.O.M.S. purpose number one), the museum deserves our complete and wholehearted support.

Thirty years ago there was no Franklin Mine, no Franklin-Ogdensburg Mineralogical Society, and no Franklin Mineral Museum. That the Franklin of old still lives in our minds and hearts in 1986 is due in no small measure to the volunteers of the F.O.M.S. and the Franklin Kiwanis Club. Volunteers are still needed. The year 2009 will be here shortly, whether we plan for it or not; if the vision I have sketched is to have any reality then, we must work for it now.

RCB

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Harvard Mineralogical Museum Association



In response to a request for information about the Franklin-Sterling Hill collection at the Harvard Mineralogical Museum and about the museum itself, Carl A. Francis, the curator, has arranged for a series of articles to be made available for publication in The Picking Table. This is the first article in that series.

"Franklin Furnace" specimens from as early as mid-19th Century are among the Harvard Mineral Museum collection, but the greatest part of the Franklin-Ogdensburg collection at Harvard dates to the days of Charles Palache's curatorship in the early 20th Century. Palache's attention was first directed toward the zinc ore body by his predecessor, John E. Wolff. Wolff had studied the petrography of the New Jersey Highlands, and his work with the Franklin limestone led him to take a closer look at the zinc mines in Franklin. His interest drew the young Palache into this examination, and soon Palache was collecting on his own, getting specimens from the miners, and spending time at the picking table itself. He later (1917) was instrumental in having the E. P. Hancock Collection come to Harvard, and in 1927 succeeded in getting the G. S. Stanton Collection, and part of the Frederick A. Canfield Collection (which was divided with the Smithsonian).

The Harvard collection of specimens from the mines and quarries of Franklin, and the mine at Ogdensburg, number in the thousands, with a species representation of something above two hundred. At the present time, several hundred of these specimens are on display. Most species are shown in the systematic exhibit collection cases grouped according to Dana. A large wall case, one of several given over to locality displays, features several larger specimens, and, lastly, two standing floor cases hold a display assembled for the 50th anniversary of Palache's Professional Paper 180 last year. One case contains approximately a hundred specimens of franklinite, zincite, willemite, and rhodonite. The other exhibits about one hundred and fifty specimens illustrating the diversity of species at Franklin. These last two cases will be dismantled later this year in preparation for another featured exhibition.

At the time of the 50th anniversary celebration last year (at which several FOMS members

and officers were present), Palache's page-proofs of his great paper were exhibited along with related crystal drawings, type specimens, and some Franklin-related material and specimens on loan from Dick Hauck. Dr. Pete Dunn of the Smithsonian, who has done so much to identify new species from Franklin, was the featured speaker. Other speakers were Dick Hauck and Dr. Clifford Frondel. The latter's subject was the story behind the publication of Professional Paper 180. More of that at another time. Jack Baum was to have spoken, but due to illness was unable to do so.

For those of you interested in visiting the Harvard Mineral Museum, the following information may be helpful. The Harvard Mineral Museum is located at 24 Oxford Street, Cambridge, Massachusetts 02138. The museum is open seven days a week except for National Holidays. The hours (Monday through Saturday) are 9:00 a.m. to 4:30 p.m. On Sunday, the hours are 1:00 p.m. to 4:30 p.m. Admission charges are: Adults \$2.00; Students and Senior Citizens \$1.50; Children (5-15 years old) \$0.50; Children (under 5 years) Free. Information about the museum can be obtained by calling (617) 495-3045. Those wanting to join the Harvard Mineral Museum Association should know that the dues are \$25.00/year. Membership provides free admission to the museum, an invitation to special museum functions, and a periodic newsletter. Please address any inquiries regarding the Harvard Mineral Museum Association to Mr. F. W. Miller, Secretary, at the address listed above.

Future articles will relate details of the collection itself, describe John Wolff's interest in the Franklin area, Palache's work on Franklin material, Palache's correspondence with other great collectors, etc.

F. W. Miller

Marsturite epitaxial on rhodonite from Franklin, New Jersey

Pete J. Dunn

Department of Mineral Sciences
Smithsonian Institution
Washington, D.C. 20560

Peter B. Leavens

Department of Geology
University of Delaware
Newark, Delaware 19711

INTRODUCTION

Marsturite, ideally $Mn_3CaNaHSi_5O_{15}$, was originally described from Franklin, New Jersey, by Peacor *et al.* (1978). That occurrence consisted of bladed, triclinic, colorless crystals (Figs. 1 and 2) associated with rhodonite, willemite and abundant manganaxinite. Only the type specimen was known at the time of description, and only one more, of similar appearance, has been found in the ensuing eight years.

Recently, as a part of investigations of the petrography of Mn-Ca silicate assemblages at Franklin, some colorless overgrowths on rhodonite crystals from Franklin, previously considered to be bustamite, were examined and found to be marsturite. A review of the literature indicated that these overgrowths had been previously examined (Larsen and Shannon, 1922) and tentatively assumed to be a rhodonite near bustamite in composition, on the basis of optical and goniometric measurements. This assignment of species was accepted by Palache (1935) and he mentioned the occurrence under bustamite in his monograph on Franklin and Sterling Hill. The description of this material by Larsen and Shannon is excellent; it reads in part:

The rhodonite occurs in freely developed crusts made up of prismatic forms [crystals] which reach 3 millimeters by 5 millimeters in size and have an elliptic cross section and serrated edges. They are terminated by a lustrous and somewhat curved face. When closely examined these are seen to have a lozenged-shaped core of deep pink rhodonite surrounded by an outer zone made up of small crystals of a paler or more brownish color, the contact between the two zones being sharp. The core shows fine polysynthetic twinning, although the major portion has a single orientation, the laminae in twin position being very thin. The outer zone, although made up of numerous small crystals, shows no twinning and extinguishes as a unit, indicating that its component crystals are in exactly parallel position . . .

The relations described by Larsen and Shannon (1922) are evident in Figures 3 and 4, which show, in cross-section, the rhodonite core and the marsturite overgrowth with serrated edges; the cover photo for this issue and figure 5 show the general appearance of the specimens.

CHEMICAL COMPOSITION

This occurrence of marsturite was confirmed by use of X-ray powder diffraction techniques, comparison of optical data, and by microprobe analysis. At the time of Larsen and Shannon's descrip-

tion, there was inadequate material from the outer zone (now shown to be marsturite) to permit a chemical analysis with the techniques then available. The microprobe analysis given here was obtained using an ARL-SEM-Q electron microprobe with an operating voltage of 15 kV and a sample current of $0.025 \mu A$, measured on brass. Standards used were rhodonite (Si, Ca, Mn, Zn), and hornblende (Fe, Mg, Na). The data were corrected using standard Bence-Albee factors. The rhodonite core is homogeneous and its composition, not given here, is virtually identical to that given by Larsen and Shannon (1922). The marsturite zone is chemically homogeneous, and similar in composition to the type material. The analysis is given in Table 1, together with that of the type marsturite. Additionally, the optical data of Larsen and Shannon (1922) are included and compared with those for the type material (Peacor *et al.*, 1978). These data are in excellent agreement, leaving no doubt that the mineral is marsturite.

OPTICAL EXAMINATION AND ORIENTATION

The optical orientations of both marsturite (Peacor *et al.*, 1978) and rhodonite (Palache, 1935) are known with precision, and provide a means of determining the orientation of the marsturite over-

Table 1. Chemical and optical data for marsturite.

	#1	#2
SiO ₂	49.3	48.94
FeO	0.5	0.24
MgO	0.1	0.12
CaO	11.5	12.46
ZnO	0.5	0.0
MnO	34.8	34.16
Na ₂ O	3.9	4.08
Total	100.6	100.00
Optic sign	+	+
2V	large	60°
α	1.687	1.686
β	1.692	1.691
γ	1.709	1.708

#1. NMNH #C2485-1, optical data from a similar sample; adopted from Larsen and Shannon (1922).

#2. NMNH #127923, type material; analytical and optical data from Peacor *et al.* (1978).

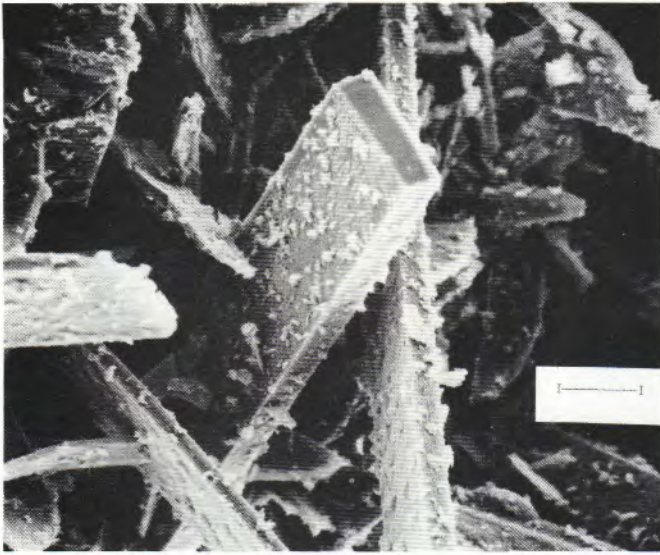


Figure 1. Euhedral lath-like marsturite crystals from the type material; Franklin, New Jersey. Scale bar is 250 μm .

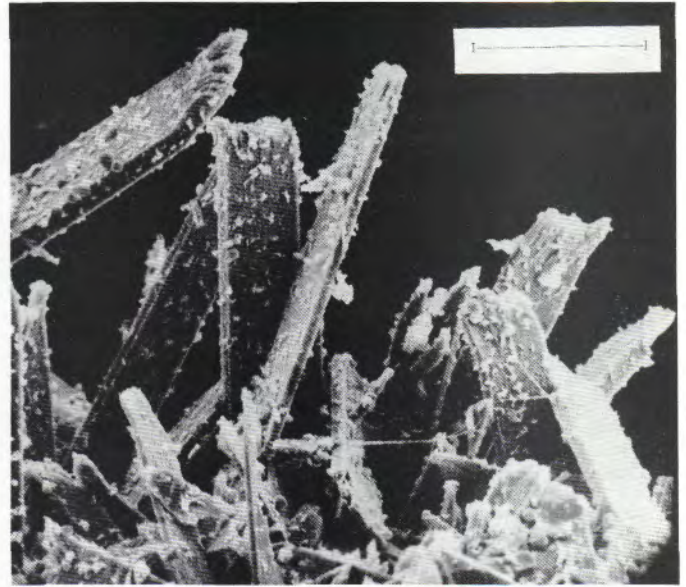


Figure 2. Cluster of lath-like marsturite crystals showing irregular terminations; Franklin, New Jersey. Scale bar is 250 μm .

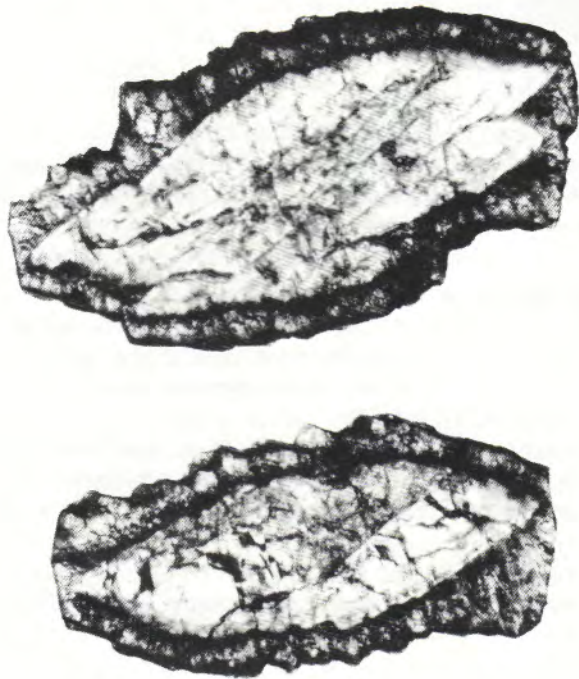


Figure 3. Transmitted-light photograph of two marsturite crystals from the newly identified material, showing the rhodonite core (colorless) and the marsturite rim (gray). Long dimension of the crystals, parallel to a , is 3.0 mm. The crystals are lying on the (001) cleavage; Franklin, New Jersey.



Figure 4. The same crystals shown in Figure 3 are here shown in polarized light with crossed nicols.

growth. The optical orientation of rhodonite is referred to the older morphological crystal axes and must be re-oriented to newer, structural axes used by Perutz (1937) and Mamedov (1958); the planes $(\bar{1}\bar{1}0)$, $(00\bar{1})$, and $(\bar{1}10)$ of the old orientation become, respectively, (100) , (010) , and (001) of the new. When this is done, it becomes clear that marsturite and rhodonite have similar, although not identical, optical orientations, with X near c , and Z near b , and similar unit cell parameters. In this orientation, the axial dimensions and

interaxial angles of rhodonite are almost identical to those of marsturite: for rhodonite from Franklin, $a = 7.66$, $b = 12.20$, $c = 6.68\text{\AA}$, $\alpha = 86.0$, $\beta = 93.2$, and $\gamma = 111.1^\circ$ (Hilmer *et al.*, 1956), and for marsturite, $a = 7.70$, $b = 12.27$, $c = 6.68\text{\AA}$, $\alpha = 84.26$, $\beta = 94.10$, $\gamma = 111.04^\circ$ (Peacor *et al.*, 1978). A number of orientations have been used for structural analysis of rhodonite; these are summarized by Peacor and Niizeki (1963).

The marsturite overgrowth coats the rhodonite with the exception of one prominent face, which corresponds to a cleavage plane for both minerals. Examination of the interference figures shown by a cleavage flake shows off-centered but nearly parallel views of the optic axial plane of both, with one optic axis and one bisectrix visible. Retardation plate tests show that the bisectrix is X for both



Figure 5. Appearance of a hand-specimen of marsturite overgrowths on rhodonite; Franklin, New Jersey. Long dimension of the crystals is 3–4 mm.

figures; thus the cleavage is $\{001\}$, designated $\{010\}$ in the old morphological orientation of rhodonite.

Close examination of the orientations of the optic axial planes in the two minerals shows that the a and b axes are also coincident in the two minerals and that the principal contact surface between marsturite and rhodonite is approximately (010) , which would provide the best fit of the unit cell translations of the two minerals. The overgrowth marsturite crystals are elongated on b , with prominent $\{001\}$ pinacoid, as in the original description (Peacor *et al.*, 1978). The rhodonite crystals are tabular on $\{010\}$ (old $\{001\}$), and elongated parallel to a , corresponding to the common habit illustrated by Palache (1935, Fig. 67).

PARAGENESIS

The paragenetic occurrence of the type marsturite was described based on the type sample. Now that this additional material has been identified, the assemblage, which is generally the same for the type and this material, can be better described. Based on ten similar specimens, the assemblage is described as one consisting chiefly of yellow manganaxinite crystals partially encrusting rhodonite crystals which coat a fracture surface in gneissic willemite-franklinite ore devoid of calcite. Because all of the samples occur on very similar ore, and the fracture surface intersects the banding of the ore at a near-constant angle, and because the mineralogy of the assemblage is relatively invariant, it is likely that these samples came from a restricted and localized occurrence within the Franklin mine. Other associated minerals are willemite and ganophyllite. The sequence of formation is pink rhodonite, followed by yellow manganaxinite and brown ganophyllite, with colorless hexagonal prisms of willemite among the last phases to form. The exposed rhodonite crystals, not covered by manganaxinite, are the ones which have marsturite rims; hence, they might have formed last. The assemblage is in other ways a notable one in that it is one of only two known ganophyllite assemblages at Franklin (Dunn *et al.*, 1983). The presence of alkalis in both ganophyllite and marsturite suggests unusual conditions; such alkali assemblages are rare in secondary vein occurrences at Franklin.

ACKNOWLEDGMENTS

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a highly magnesian Alleghanyite from sterling hill, new jersey

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Ole V. Petersen and J. Bollhorn
Geology Museum, University of Copenhagen
Copenhagen, Denmark

Pete J. Dunn
Department of Mineral Sciences
Smithsonian Institution
Washington, D.C. 20560

SUMMARY

A highly magnesian alleghanyite from Sterling Hill, Sussex County, New Jersey, is monoclinic, $P2_1/b$, with $a = 4.827$, $b = 10.613$, $c = 8.116$ Å, and $\alpha = 108.65^\circ$, $Z = 2$. Microprobe analysis yields SiO_2 26.7, FeO 0.4, MgO 15.0, ZnO 3.5, MnO 50.0, F 3.1, H_2O [2.5], less $\text{O} = \text{F}$ 1.3, sum = 99.9 weight percent. This is one of the most highly magnesian alleghanyites reported, and has a calculated formula, based on $\text{Si} = 2$ atoms, $(\text{Mn}_{3.17}\text{Mg}_{1.68}\text{Zn}_{0.19}\text{Fe}_{0.02})_{\Sigma 5.06}\text{Si}_{2.00}\text{O}_{8.07}(\text{OH}_{1.25}\text{F}_{0.73})_{\Sigma 1.98}$.

INTRODUCTION

A small hand-specimen, acquired in 1982 by the Geological Museum, Copenhagen, Denmark, was labeled alleghanyite from Sterling Hill, Ogdensburg, Sussex County, New Jersey. It consists of coarse-grained white calcite, 1–2 mm rounded willemite crystals, and 2–5 mm franklinite crystals. One side of the specimen, obviously the surface of a fracture in the ore, is covered by a thin crust of manganoan dolomite, a profusion of 0.1–1.0 mm very well formed and lustrous secondary franklinite crystals, and a few groups of 0.05–0.1 mm incomplete brown transparent crystals of what proved to be a highly magnesian alleghanyite. Inasmuch as very little is known of the intermediate compositions in the alleghanyite-chondrodite series, we subjected these crystals to a detailed characterization, the results of which are presented here.

PHYSICAL and OPTICAL PROPERTIES

The alleghanyite from Sterling Hill shows no apparent cleavage. The luster is vitreous on fracture surfaces. The specific gravity measured by suspension in heavy liquids is $3.75 (\pm 0.05)$, compared with the calculated value of 3.82 g/cm^3 derived from the empirical formula. This value, as would be expected in the case of Mg-for-Mn substitution, is lower than that of end-member alleghanyite. As summarized by Ribbe (1982), indices of refraction are not useful criteria for distinguishing the various members of the homologous series of humites, except for the Mg-member, norbergite. However, we did prepare a thin section, cut parallel to (101) for examination using the universal stage. This magnesian alleghanyite is biaxial, negative, with $2V_\alpha = 65^\circ (\pm 2^\circ)$, slightly lower than that calculated from the data of Rogers (1935) for Bald Knob, North Carolina, alleghanyite, which is near end-member composition (Winter *et al.*, 1983). The orientation of the indicatrix relative to the unit cell was determined to be $\alpha \wedge c = 20^\circ (\pm 2^\circ)$, $\beta = b$, and $\gamma = a$.

The Picking Table, Fall 1986

CRYSTALLOGRAPHY

Morphological Crystallography

With the exception of two fairly complete crystals of this magnesian alleghanyite, all the others show little more than two or three crystal faces. The best developed of the two crystals was measured on the two-circle goniometer. Orientation was determined by use of oscillation diagrams which showed the two most prominent zone axes of the crystal to be 8.1 Å (the c axis) and 10.6 Å (the b axis). This procedure also established that the crystal is untwinned and greatly facilitated the identification of the forms by comparison with a stereographic projection of possible forms constructed using the unit cell parameters. The forms present are: {010}, {100}, {110}, {120}, {101}, {111} and {112}. Transformation matrix of face indices from this setting to the conventional one for monoclinic crystals is: 001/100/010. Figure 1 shows a drawing of an idealized crystal having a distinct prismatic habit; in this drawing, the faces are indexed in the conventional manner. Figures 2 and 3 show crystal drawings of the same crystal using the axial orientation for humite group minerals discussed below, and adopted here. Figures 4 and 5 are SEM photomicrographs of more complexly formed magnesian alleghanyites from similar secondary assemblages at Sterling Hill.

X-ray Crystallography

X-ray diffraction studies, including Weissenberg single-crystal methods, showed this highly magnesian alleghanyite to be monoclinic, $P2_1/b$, with unit cell parameters $a = 4.827$, $b = 10.613$, $c = 8.116$ Å, and $\alpha = 108.65^\circ$, $V = 393.9$ Å³, $Z = 2$. We adopt here, for X-ray data, the convention of Jones (1969) wherein alpha is the unique angle, so as to facilitate comparison of these data with those of other recent investigators, all of whom have adopted this convention for humite-group minerals. These values were obtained by least-squares refinement using the indexed powder pattern, and the program REFBASE written by E. S. Leonardsen. The powder data (Table 1) were obtained with a Guinier-Hägg camera, utilizing quartz as an internal standard and $\text{CuK}\alpha$ X-radiation ($\lambda = 1.54051$ Å). In Table 2 we compare the unit cell of this magnesian alleghanyite with the unit cells of end-member alleghanyite and chondrodite. From this table it is evident that the volume of the unit cell of this magnesian alleghanyite falls between the volumes of end-member alleghanyite and chondrodite.



Figure 5. SEM photomicrograph of magnesian alleghanyite from a different assemblage.

Table 1. X-ray powder diffraction data for magnesian alleghanyite.

<i>d</i> (obs)	I/I ₀	<i>hkl</i>	<i>d</i> (calc)	<i>d</i> (obs)	I/I ₀	<i>hkl</i>	<i>d</i> (calc)
7.68	3	001	7.689	2.294	1	211	2.293
5.00	1	02 $\bar{1}$	5.004	2.202	1	211	2.199
4.083	1	101	4.088	2.176	1	04 $\bar{3}$	2.176
4.039	2	11 $\bar{1}$	4.034	2.176	1	220	2.176
3.850	1	002	3.845	2.087	2	113	2.086
3.671	1	02 $\bar{2}$	3.673	2.070	1	21 $\bar{2}$	2.073
3.579	3	111	3.581	2.021	1	221	2.022
3.473	1	12 $\bar{1}$	3.474	1.907	1	15 $\bar{2}$	1.907
3.104	10	11 $\bar{2}$	3.102	1.856	2	150	1.856
2.937	1	121	2.937	1.856	2	114	1.857
2.840	7	13 $\bar{1}$	2.840	1.791	6	222	1.790
2.753	4	130	2.753	1.787	6	104	1.786
2.702	4	112	2.702	1.787	6	24 $\bar{1}$	1.785
2.667	2	022	2.670	1.787	6	22 $\bar{3}$	1.785
2.651	1	04 $\bar{1}$	2.653	1.758	1	06 $\bar{1}$	1.759
2.651	1	02 $\bar{3}$	2.652	1.758	1	203	1.757
2.585	4	13 $\bar{2}$	2.583	1.737	1	24 $\bar{2}$	1.737
2.501	2	04 $\bar{2}$	2.502	1.737	1	213	1.670
2.416	1	200	2.414	1.671	1	133	1.670
2.400	3	131	2.400	1.588	1	310	1.589
2.354	2	11 $\bar{3}$	2.356	1.562	1	043	1.562
2.335	1	122	2.336	1.552	1	04 $\bar{5}$	1.551
2.325	5	14 $\bar{1}$	2.325	1.552	1	224	1.551
2.325	5	12 $\bar{3}$	2.325	1.537	3	061	1.538
						005	1.538

resulting analysis, with H₂O calculated to sum (OH + F) to 2.0, yields: SiO₂ 26.7, FeO 0.4, MgO 15.0, ZnO 3.5, MnO 50.0, F 3.1, H₂O [2.5], less O = F 1.3, sum = 99.9 weight %. The accuracy of the data is ± 3% of the amount present for major elements, ± 15% of the amount present for F.

The formula for this alleghanyite, calculated on the basis of Si = 2.0 atoms, yields: (Mn_{3.17}Mg_{1.68}Zn_{0.19}Fe_{0.02})_{Σ5.06}Si_{2.00}O_{8.07}(OH_{1.25}F_{0.73})_{Σ1.98}, which is in very good agreement with the structural formula for alleghanyite, Mn₅(SiO₄)₂(OH,F)₂. This alleghanyite has one of the highest Mg contents ever reported in alleghanyite. Subsequent to our study, we learned that similar magnesian alleghanyite from Sterling Hill had been subjected to crystal structure analysis (Francis, in press), and the Mg was found to be ordered in the structure.

Table 2. Unit cell data for alleghanyite and chondrodite.

	Alleghanyite Bald Knob Rentzeperis (1970)	Alleghanyite Sterling Hill Present study	Chondrodite Finland Gibbs <i>et al.</i> (1970)
<i>a</i>	4.8503 Å	4.827 Å	4.7284 Å
<i>b</i>	10.7198	10.613	10.2539
<i>c</i>	8.2747	8.116	7.8404
α	108.64°	108.65°	109.059°
V	416.3 Å ³	393.9 Å ³	359.3 Å ³
Space Group	P2 ₁ /b	P2 ₁ /b	P2 ₁ /b

Data for Rentzeperis (1970) reset to new convention with alpha as the unique angle.

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Fibrous Rutile

from Franklin, New Jersey

Mark Germiné

New Jersey Medical School
100 Bergen Street
Newark, New Jersey 07103

The varied mineral assemblages of the Buckwheat dolomite in Franklin, New Jersey, have recently been described in detail by Peters *et al.* (1983). In Figure 18 of their paper, an unidentified mineral referred to as "mountain leather," is shown in association with hemimorphite. "Mountain leather" is usually used to refer to a fabric-like aggregate of flexible mineral fibers with an interlaced growth habit. Fabric-like habit has been noted previously in palygorskite, sepiolite, tremolite-actinolite and chrysotile (Martin-Vivaldi and Robertson, 1971; Zoltai, 1981).

A sample of the Buckwheat "mountain leather" was obtained

from Thomas Peters of the Paterson Museum, Paterson, New Jersey. On the basis of its energy-dispersive X-ray spectrum and other data, the fibrous mineral was identified as rutile. The Buckwheat dolomite is noted for the occurrence of hair-like crystals of rutile (Peters *et al.*, 1983), but flexible-fiber bundles of rutile have not been previously reported.

Rutile "mountain leather" is composed of thin, paper-like to stringy masses (Fig. 1) that coat vuggy crystals of dolomite and form thin layers between adjoining dolomite crystals. The masses are of very pale lavender color, and have a silky, sub-metallic



Figure 1. Scanning electron micrograph of rutile "mountain leather." Maximum dimension of aggregate is about 2.1 mm. White bar to right of aggregate represents 100 micrometers.



Figure 2. Scanning electron micrograph showing fibrous habit of rutile "mountain leather." Length of field is about 0.1 mm. Small white bar represents 10 micrometers.

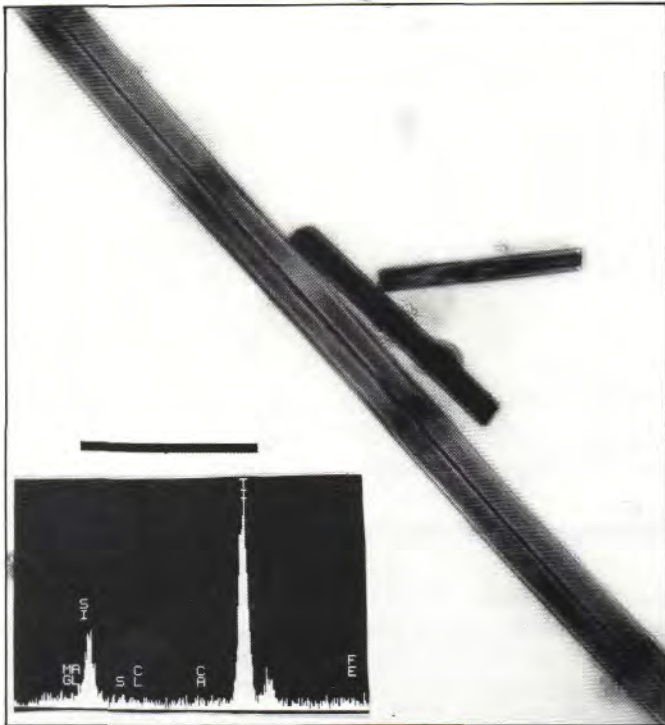


Figure 3. Transmission electron micrograph of individual rutile fibers (ground sample). Note delicate bend contours and periodic irregularities (possible dislocations) along fiber lengths. Energy dispersive spectrum is shown on lower left, along with scale bar representing 0.5 micrometers.

luster. In transmitted polarized light, individual fiber-bundles have parallel extinction, and are pleochroic from light yellowish brown to dark brown. Masses of the fiber are dark brown and nearly opaque in transmitted light. Fibrous aggregates are insoluble in cold, concentrated hydrofluoric acid, consistent with their identification as rutile (Raman and Jackson, 1965).

Scanning electron microscope (SEM) examinations reveal a delicate, fibrous growth habit consisting of bundles of long, flexible fibers (Fig. 2). Energy dispersive X-ray (EDX) data gathered under the SEM indicate that the fibers are composed mostly of titanium dioxide, with a small amount of iron. Silicon, aluminum, calcium and magnesium were also detected on EDX spectra, but are thought to be associated with scattered grains of other minerals such as calcite, dolomite and talc.

Transmission electron microscope examinations show that fibrous aggregates of rutile are composed of ultrafine crystals (Fig. 3). Individual crystals have relatively uniform widths, typically ranging from 0.07 to 0.10 micrometers. Electron diffraction and energy dispersive X-ray spectroscopy were used to confirm the identification of individual rutile crystals under the transmission electron microscope. Electron diffraction indicated that crystals usually lie on (110). A c/a ratio of 0.64 to 0.65 was calculated from

(110) diffraction nets, in excellent agreement with the ratio (0.6442) for rutile given by Palache *et al.* (1944).

Flexibility and strength, characteristic of the rutile described here, are developed in fibers as a function of decreasing diameter (Zoltai, 1981). These properties, in turn, give rise to other characteristics of fibrous minerals, such as fabric-like habit. The differences in habit between rutile "mountain leather" and acicular rutile may thus be explained by differences in crystal diameter.

The formation of fibers and other ultrafine crystals is favored by rapidly changing conditions which can lead to rapid nucleation and crystal growth (Hyndman, 1972; Ross, 1978; Zoltai, 1981). Crystal-line disorder, again favored by disequilibrium conditions, may also favor a fibrous growth habit by limiting width-wise crystal growth (Ross, 1978).

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A new zinc magnesium carbonate and data for other unnamed species from Franklin and Sterling Hill, New Jersey

Pete J. Dunn

Department of Mineral Sciences
Smithsonian Institution
Washington, DC 20560

INTRODUCTION

The mineral described below was found by the writer about twelve years ago in samples from Sterling Hill, New Jersey. Its uniqueness was noted then, but a description was deferred in hope of finding single crystals, analysis of which would permit a rigorous definition. Many samples have been encountered in subsequent years, but none has been of adequate quality to permit the accurate definition of this mineral as a valid species. Because it is unique in nature, and not rare at Sterling Hill, the incomplete description is recorded here; perhaps other samples will be found elsewhere, permitting its eventual characterization. It remains at present an unnamed mineral.

DESCRIPTION

This zinc-magnesium-carbonate-hydroxide mineral occurs in a consistent, extremely fine-grained texture. Many samples have a frothy, bulbous aspect; others commonly have an apparent cleavage, lending a layered appearance to the aggregate. Those specimens not showing such features have a texture resembling clay. The mineral is invariably white with a pearly luster; the luster may be dulled on museum specimens or those which have been extensively handled. It is opaque in aggregate, but transparent in thin section. The fracture of the aggregate is irregular. One of the more unique physical aspects of this mineral is its density, which is approximately 0.865 g/cm³ in the aggregate. Compression by hammering yields a density of 2.52 g/cm³, but this is an arbitrary value; the true density could be much higher, and the above value should be accepted only as a minimum.

Optically, this mineral is weakly anisotropic with low birefringence. The mean index of refraction is $n = 1.556(3)$. No other optical data could be determined due to the fine-grained nature of the mineral. In longwave ultraviolet, this mineral fluoresces a weak violet, but fluorescence is not discernible under shortwave ultraviolet light.

Spectrographic analysis and wavelength-dispersive microprobe scans indicate that Mg, Zn, Mn, Ca, Cl and Fe were the only detectable cations. The mineral is completely soluble in HCl and effervesces with considerable enthusiasm. Microprobe analyses, with CO₂ determined by carbon analyzer, and H₂O determined by the Penfield method, yielded: FeO 0.1, CaO 0.1, MgO 30.9, MnO 3.6, ZnO 31.6, CO₂ 12.7, H₂O⁺ 16.4, H₂O⁻ 2.4, Cl 0.8, sum = 98.6, less O = Cl 0.2, total = 98.4 wt. %. An empirical formula, calculated on the basis of 19 oxygen atoms, is: Mg_{5.13}(Zn_{2.60}Mn_{0.34}Ca_{0.01}Fe_{0.01})_{Σ2.96}(CO₃)_{1.93}(OH)_{12.18}Cl_{0.15}•0.98H₂O, or ideally

Mg₅(Zn,Mn)₃(CO₃)₂(OH,Cl)₁₂•H₂O. However, this formula is but a representation of the composition of the aggregate, which may include impurities as described below.

The nature of the fine-grained crystal size precluded single-crystal studies. The strongest diffractions in the X-ray powder diffraction pattern are (d in Å, I/I_0): 7.47(100), 5.66(20b), 3.038(20), 2.694(60), 2.614(20), 2.515(20), 1.569(40), and 1.550(4). These diffractions are common to all studied specimens of this mineral. However, the available powder patterns of the various specimens found to date all show extra reflections, most of which are weak, but not identifiable as known species. It appears that there may be a mixture of at least two phases in most specimens of this mineral, and that both of them are unknown to scientific knowledge. The dominant one is described here; the minor phase appears to have some silicon present, and may be a silico-carbonate. Even if this is a mixture, it is clear that an unnamed mineral is present.

The preponderance of the known samples have come from Sterling Hill, where it is associated with hetaerolite and zincite as the dominant associated species. Less common associates include chlorophoenicite, willemite, dolomite, hodgkinsonite and celestine. Most occurrences are simply labeled as being from Sterling Hill; one of the more spectacular bulbous occurrences was in the 1570E stope, on the 1300 level. Samples in the Bauer collection were labeled as fluorborite, and others so labeled may repose in other systematic collections. This mineral is readily differentiated from fluorborite by its effervescence in HCl.

At Franklin, this mineral might have been less common. Only one specimen is known, consisting of sparse white spherules associated with sphalerite on the Franklin holdenite specimen, formerly in the collection of Charles Key, and described by Dunn (1981).

OTHER UNNAMED MINERALS FROM FRANKLIN AND STERLING HILL

Below are listed data for some other minerals from Franklin and Sterling Hill which remain unidentified. In most cases, there is inadequate material to permit full characterization. X-ray diffraction lines are given in order of decreasing intensity.

• Acicular bright-yellow crystals associated with flinkite, cahnite, jarosewichite (Dunn *et al.*, 1982), and hausmannite, from Franklin. Energy-dispersive X-ray analysis (EDAX) indicates only Ba, Mn,

and U as detectable cations. Powder X-ray diffraction (XRD) lines are (d , in Å): 3.28, 3.53, 2.95, 2.12, and 6.40. The pattern has some similarities to that of carnotite. The mineral is very rare and was called to my attention by Mrs. Alice Kraissl. (NMNH #143784.)

• Yellow, fibrous green coatings on calcite/mica matrix from Sterling Hill. EDAX indicates Zn and U as major elements; the samples are of doubtful purity. The strongest XRD lines are 6.30, 2.70, and 8.40. The mineral was moderately abundant in impure samples. It was called to my attention by Richard Bostwick. (NMNH #144807.)

• White pearly spherules in vuggy franklinite-willemite ore from Sterling Hill. EDAX shows only Zn as a detectable cation; the mineral effervesces in HCl and is therefore in part a Zn carbonate. The strongest XRD lines are: 18.0, 9.0, 2.94, 6.00, and 1.57. The mineral is rare and was called to my attention by Thomas Peters. (NMNH #147353.)

• Bright blue fibrous crystals with red willemite and franklinite from Sterling Hill. EDAX shows only Cu as a detectable cation. The mineral is readily soluble in HCl without effervescence, suggesting it might be a hydroxide, nitrate or oxalate. The strongest XRD lines are: 3.95, 4.75, 2.50, 1.72, 3.20, 1.85, 1.93, 4.35, and 2.78. The mineral is rare and was called to my attention by Ewald

Gerstmann and Fred Parker. (NMNH #146924.)


• Black acicular crystals, associated with willemite from Franklin. Wavelength-dispersive analysis (Dunn *et al.*, 1982) shows that it is a Mn-Zn-arsenate-hydroxite, consistent with a highly oxidized chlorophoenicite-like mineral. The strongest XRD lines are: 10.90, 3.02, 2.33, 2.509, and 1.814. The mineral is rare and was called to my attention by Andrew Dilatush and James Kaufmann. (NMNH #149091.)

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MINERAL NOTES

DEFINITION OF THE FRANKLIN - STERLING HILL AREA

Each year the Society publishes a list of the minerals found in the Franklin - Sterling Hill area. This general "area" is, however, undefined and this has led to some ambiguity as to the inclusion or exclusion of collecting areas, and the scope of the list of minerals.

After several years of discussion, we have defined an area which encompasses both orebodies, the related magnetite deposits, and the marble quarries which lie between the ore deposits. Although geologic boundaries can be chosen for the east and west sides of the area, there are no clearly defined structures for the north and south limits. After much consideration, we have decided to define the "Franklin - Sterling Hill area", for the purposes of the List of Minerals, in close conformity with the "Special Map" used in the Franklin Folio. Accordingly, we define the below-noted boundaries for the List of Minerals from the Franklin - Sterling Hill area:

East: The base of Hamburg and Sparta Mountains (Hague et al., 1956)

West: The eastern edge of the Wildcat band of marble to where it plunges beneath the unconformity. The west boundary north of that point is defined by the Walkill River.

South: Brooks Flat Road (just a bit south of Sterling Hill).

North: A line east-west from the intersection of routes 23 north and 519 east (type locality for the Hardyston quartzite).

John L. Baum
Pete J. Dunn

New To Science

ORTHOSERPIERITE

A serpierite-like mineral was found by Mrs. Alice Kraissl in August of 1981. It had been found in an unknown part of the Sterling Hill Mine in previous years. It occurred in very tiny light blue crystals, too small for any determinations other than X-ray powder diffraction techniques. The data were found to be unique, and put aside until either additional samples were found, which could permit its characterization, or until it was discovered at some other deposit. It has now been discovered, from the Chessy Mine in France, and described by Sarp (1985) in Schweiz. Mineral. Petrogr. Mitt., 65, 1-7. The Sterling Hill occurrence is the second known. Send no samples for verification.

Dr. Pete J. Dunn
Smithsonian Institution

Research Reports

BASTNAESITE-LIKE MINERAL

A rare-earth mineral whose X-ray diffraction pattern clearly resembles bastnaesite, (Ce,La)(CO₃)F, has been identified from Franklin, New Jersey. It occurs as dark brown granular masses in a coarse-grained, pale green microcline associated with allanite. The XRD pattern is slightly shifted relative to bastnaesite, JCPDS standard #11-340. EDAX analyses show cerium and lanthanum to be the only major heavy elements present. The light species (e.g. OH, F, etc.) were not determined and no quantitative techniques were used to determine the exact amounts of cerium and lanthanum. Such techniques were beyond the scope of this work, the intention of which was to ascertain whether

or not the mineral in question was of mineralogical interest, and to subsequently document any useful findings.

The specimen studied belongs to Bruce E. Smith of Allentown, Pennsylvania. Other specimens should turn up since its matrix is very abundant at Franklin. It is suggested that the collector keep in mind that this material be called a "bastnaesite-like mineral" until it is fully characterized and its exact identity ascertained.

Fred J. Parker
P.O.Box 1355
Columbia, Maryland 21044

HASTINGSITE

Many crystals of diopside, from the Noble and Passaic pits at Sterling Hill, and formerly named "jeffersonite", have very small, lustrous, dark-green-to-black crystals overgrown on crystal faces. These crystals have been chemically analyzed by microprobe techniques yielding: SiO₂ 36.6, Al₂O₃ 12.9, total Fe as FeO 20.3, MgO 7.1, CaO 10.9, K₂O 1.8, Na₂O 2.4, ZnO 0.7, MnO 2.9, H₂O undetermined, sum = 95.6 weight percent. The composition is that of a magnesian hastingsite.

Dr. Pete J. Dunn
Smithsonian Institution

Magnesian Alleghanyite

The following is an abstract of an article entitled, "Crystal structure refinement of magnesian alleghanyite", written by Carl A. Francis, Harvard Mineralogical Museum, which appeared in The American Mineralogist, Volume 70, pages 182-185, 1985.

Introduction

The humite group is a group of four homologues characterized by the general formula $n\text{Mg}_2\text{SiO}_4 \cdot \text{Mg}(\text{OH},\text{F})_2$ where $n = 1$ for norbergite, $n = 2$ for chondrodite, $n = 3$ for humite, and $n = 4$ for clinohumite. Alleghanyite is the manganese analogue of the $n = 2$ homologue and was first described from Bald Knob, Alleghany County, North Carolina by Ross and Kerr (1932). Alleghanyite's isotypism with chondrodite was proposed by Rogers (1935) and established by Rentzeperis (1970). Cook (1969) recognized alleghanyite in specimens from both Franklin and Ogdensburg in two parageneses—as isolated euhedral crystals in the Franklin Marble and as euhedral crystals in veinlets cutting the

ore. Harvard's specimen #109468, from the Sterling Mine, exhibits crystals of magnesian alleghanyite among a druse of brilliant black cube-octahedrons of franklinite on a slickensided surface of red willemite-franklinite-calcite ore. Part of an investigation of Mg/Mn ordering in the olivines and humites (Francis, 1980; Francis and Ribbe, 1978, 1980) dealt with the refinement of the crystal structure of an untwinned crystal from this specimen.

Experimental Procedures

Chemical composition was determined by use of an automated ARL-EXM electron microprobe. Simple oxides and silicates including synthetic tephroite were used as standards.

The crystal was mounted on a Picker FACS-1 four-circle diffractometer. The unit cell dimensions: $a = 4.815(2)$ Å, $b = 10.574(3)$ Å, $c = 8.083(3)$ Å, and $\alpha = 108.74(2)^\circ$ were refined from twelve, individually-centered, high-angle reflections ($2R \geq 40^\circ$).

Refinement

Full matrix, least-squares refinement was carried out using the program RFINE (Finger and Prince, 1975). Scattering curves for neutral atoms were taken from Doyle and Turner (1968). Corrections for anomalous dispersion were taken from the *International Tables for Crystallography* (1974).

Stereochemistry

The steric details of the chondrodite-alleghanyite structure result from distortions of the close-packed anion array by cation-cation repulsions across shared polyhedral edges. The M(1) octahedron in magnesian alleghanyite is somewhat more distorted than in alleghanyite. Distortion of the octahedra decreases with the increasing number of monovalent ligands.

Cation ordering

The octahedral cations in magnesian alleghanyite are ordered. Mn-Mg distribution cannot be uniquely determined because of significant zinc content. Refined occupancies are consistent with prior findings for olivines (Francis and Ribbe, 1980) and manganhumite (Francis and Ribbe, 1978). The smallest octahedron, M(3) with $\langle \text{M} - (\text{O},\text{F},\text{OH}) \rangle = 2.118$ Å, is principally occupied by the smallest cation, Mg ($r = 0.720$ Å), while M(1) with $\langle \text{M} - \text{O} \rangle = 2.191$ Å and M(2₅) with $\langle \text{M} - (\text{O},\text{F},\text{OH}) \rangle = 2.212$ Å are principally occupied by Mn ($r = 0.830$ Å). Site occupancies

and effective ionic radii are both highly correlated with mean octahedral bond length.

Summary of cation ordering in the humites

Humites may contain Mg, Ca, Ti, Mn, Fe, and Zn. However, only Mg, Mn, and Ca form end members. The octahedral sites, into which these cations are ordered, vary in their distortion, ligancy, size, and symmetry. This study, as have others, clearly demonstrates that manganese is concentrated in the larger sites, which decrease in size in the order $M(2_6) > M(2_5) > M(1) > M(3)$. Kato (pers. comm.) has refined the structure of a sonolite (Mn-rich, $n = 4$ homologue) which is the most calcium-rich natural humite yet reported. Implications from the various studies are that Ca is concentrated in the largest octahedral sites and Ti^{4+} appears to be preferentially concentrated in the smallest octahedral site, $M(3)$. It can be said that octahedral cations in the humites are ordered according to size criteria, although ligancy (O,OH,F) may be the controlling factor where charge balance (e.g., Ti^{4+}) and crystal-field effects (e.g., Fe^{2+}) are involved.

Franklin Mineral Museum Message

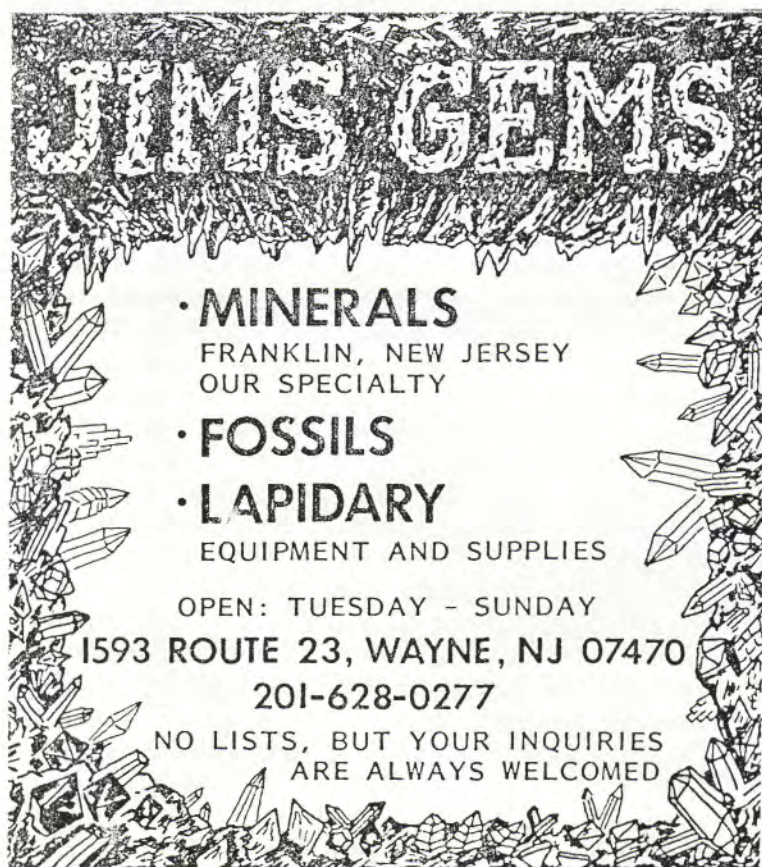
Wilfred (Bill) Welsh has most graciously offered his collection of minerals from world-wide sources to the Franklin Mineral Museum. Numbering over four thousand specimens at present, the collection will provide material which, with the museum's present display and the recently acquired Spex-Gerstmann Collection, should result in exhibits of great educational and scientific value. The Welsh Collection and its enthusiastic and knowledgeable curator have been the inspiration of budding scientists for many years. It is expected that the display to be exhibited as a unit in its own room at the museum will continue to influence young minds as it has in the past. Numerous teaching aids are included in the donation. A drive for funds with which to enlarge the museum is planned.

Among recent Franklin area acquisitions of the Franklin Mineral Museum, purchased from Ewald Gerstmann and now on exhibit, are pimelite, clinoclase, arseniosiderite, zinkenite, digenite, metazeunerite, and niahite. Another noteworthy specimen shown is the vein of svabite-like mineral containing yeatmanite found on the Buckwheat Dump last fall by Peter Fawcett, aged 9, while accompanied by John Cianciulli. The vein is considered to be johnbaumite due to its associated mineralogy and fluorescence, both similar to the original find of that material.

JLB

Funds Solicited

The Spex-Gerstmann Collection is now in the proud possession of the Franklin Mineral Museum. Pending construction of suitable quarters at the Museum, space is being rented at the Gerstmann Mineral Museum by Dick Hauck, the Franklin Mineral Museum's President of the Board of Trustees, for the convenience of the Museum's friends. Anyone who wishes to share helping to cover this rental can contact Dick Hauck at 8 Rowe Place, Bloomfield, New Jersey 07003.



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The Picking Table, Fall 1986

from the Editor's Desk

Policy regarding manuscripts for use in the Picking Table

All manuscripts will be reviewed by the Editorial Board. Authors may be requested to submit more data, to rewrite portions, delete portions, or to permit alteration of the manuscript by the Editorial Board to insure that it meets the standards of, and is aligned with the goals of the F.O.M.S. Photographs submitted with manuscripts should be duplicates. The return of photographs cannot be guaranteed. Articles must be submitted at least two months before the Picking Table goes to press on Feb. 1st or Aug. 1st.

A color issue of PT next year.

Before the next regularly scheduled meeting, all members should give some thought to what a color issue of the Picking Table entails. Depending on the printer and his equipment and the cost, we will probably have two or four pages of color. Here are the types of questions that need to be considered: 1) How large should the individual photographs be? 2) Should the photographs be confined to mineral crystals only? 3) Should there be restrictions as to which species should be photographed? 4) Should separate and equal coverage be given to Franklin and Sterling Hill material? 5) Who should judge the photographs and pick the ones to be used? 6) What should the deadline be for submission of entries? 7) How many entries can one member submit?

Considering the number of possible entries and the complexity of the process, it becomes obvious that the Fall, 1987 issue is the logical target. Come to the meeting with constructive ideas so the project can get off on the right foot.

Advertising Space

Give some thought to the use of advertising space in the Picking Table for personal items. Request individuals with particular species or assemblages of Franklin Sterling Hill material to contact you for possible trade or sale or even for photographing. The ads could be used to great advantage and they are cheap compared to scouting over several states attempting to find specific items. Possibly,

the F.O.M.S. itself could use this approach to locate the "best of species" for historical purposes. What is your opinion?

A "Thank You" to our printer!

Getting the Picking Table to you on time involves the talents and efforts of many people. Our printer, CENTRAL LETTER SHOP INC., located at 385 Main Street, Little Falls, New Jersey 07424 deserves a lot of credit. The fast service and the quality of their work should not go unnoticed. A "thank you" is always nice but it might be even nicer if our membership remembered the CENTRAL LETTER SHOP INC. the next time they need business cards printed or need to have labels printed for their collection.

Franklin-Sterling Mineral Exhibit

Don't miss this year's Franklin-Sterling Mineral Exhibit, Saturday and Sunday, October 4th and 5th, at the Armory in Franklin. To the best of my knowledge there has been no change in the hours or the admission prices. The featured speakers are Mr. Vandall King and Mr. John L. Baum. Van's talk is entitled, "History of Franklin's Minerals and Its Personalities." Jack's talk is entitled, "History of the Franklin Museum Site." Sounds interesting!

F.O.M.S. Banquet

The 8th Annual F.O.M.S. Dinner will be held on Saturday, October 4, 1986. It will take place at Wilpert's Newtonian Inn, on Routes 206 and 94 just north of Newton, New Jersey. Cocktails are at 6:30 p.m. and the prime rib dinner (\$16.50 per person, includes everything but the Bar) begins at 7:30 p.m. To reserve tickets, contact Mrs. J. D. (Helen) Warinsky, 695 Suffern Road, Teaneck, New Jersey 07666, telephone (201) 836-4048. The Guest Speaker will be Mr. Vandall King and his topic will be "Franklin is not like Langban!" The Master of Ceremonies will be Mr. Richard C. Bostwick and the Auctioneer will be Mr. Richard Hauck. Choice material makes for a great auction. Do your part! It should be a memorable evening.

OSD

The Picking Table, Fall 1986

Fall Program

The FRANKLIN-OGDENSBURG MINERALOGICAL SOCIETY, Inc.



1986

Regular Society activities consist of field trips, micro-mineralogy study sessions, and lecture programs. Field trips vary as to time and location according to schedule. Morning micro-mineralogy study sessions take place from 10:00 a.m. to noon in Kraissl Hall at the Franklin Mineral Museum. Afternoon lecture programs begin at 2:00 p.m. at the Hardyston Township School, Route 23, Franklin, New Jersey. Pre-meeting activities begin at 1:00 p.m. - Lectures open to public.

Saturday

September 20, 1986 Program: "Franklin Collections" by Mr. Richard Hauck

Field Trip: Franklin Quarry (formerly Farber Quarry) on Cork Hill Road, between Franklin and Ogdensburg, New Jersey. 9:00 a.m. to 12:00 noon.

Micro-Group: Kraissl Hall, Franklin Mineral Museum, Franklin, New Jersey. 10:00 a.m. to noon.

* * * * *

Saturday

October 18, 1986 Program: Symposium/Workshop on Mineral Photography and Fluorescence Photography. Moderator: Mr. Ralph Thomas.

Field Trip: Bodnar/Edison Quarry, Rudeville, New Jersey. 9:00 a.m. to 12:00 noon.

Micro-Group: Kraissl Hall, Franklin Mineral Museum, Franklin, New Jersey. 10:00 a.m. to noon.

* * * * *

Sunday

October 19, 1986 Field Trip: Lime Crest Quarry, Sparta, New Jersey 9:00 a.m. to 3:00 p.m. (weather and attendance permitting).

* * * * *

Saturday

November 15, 1986 Program: "The Sterling Mine" by Mr. Robert W. Metsger, New Jersey Zinc Company, Superintendent of the Sterling Mine.

Field Trip: Franklin Quarry (formerly Farber Quarry) on Cork Hill Road, between Franklin and Ogdensburg, New Jersey. 9:00 a.m. to 12:00 noon.

Micro-Group: Kraissl Hall, Franklin Mineral Museum, Franklin, New Jersey. 10:00 a.m. to noon.

* * * * *

while in Franklin

GERSTMANN FRANKLIN MINERAL MUSEUM

14 Walsh Road,
Franklin, New Jersey 07416
Telephone: (201) 827-3728

Hours: Various. It is best for out-of-towners to phone ahead to make certain the museum will be open.

The Spex-Gerstmann Collection is still on exhibit here and will remain so until it moves to the Franklin Mineral Museum at some future date. This is the world's finest private collection of Franklin - Sterling Hill minerals.

Admission: Free but donations are gratefully accepted.

EG

FRANKLIN MINERAL MUSEUM

6B Evans Street, Box 54,
Franklin, New Jersey 07416
Telephone: (201) 827-3481

Hours: Vary with the season.

Spring Season: April 15 to June 30

Summer Season: July 1 to August 31

Fall Season: September 1 to November 15

Spring & Fall Hours: Friday & Saturday, 10-4; Sunday, 12:30 to 4:30. Closed Monday. Open Tuesday through Thursday for groups, by reservation only.

Summer Hours: Wednesday through Saturday, 10-4; Sunday, 12:30 to 4:30. Closed Monday and Tuesday.

Admission: \$2.00 for adults; \$1.00 for students (first through twelfth grades); Free admission for children (kindergarteners and younger).

Admission charge entitles one either to the guided tour of the museum, including the mineral collection, fluorescent exhibit, and mine replica, or to the Buckwheat Dump, where the daily collecting limit per person is 20 pounds. Those wishing to tour the museum and collect on the Buckwheat Dump must pay a separate admission for each.

For further information contact the manager, Stephen Sanford, at the telephone number shown above. After hours, call (201) 398-7303.

SS

SUSSEX COUNTY LIBRARY, EASTERN DISTRICT BRANCH

103 Main Street, Franklin, New Jersey 07416
Telephone: (201) 827-6555

Hours: Monday through Friday, 9:00 a.m. - 5:00 p.m.; Tuesday and Thursday evenings, 6:30 p.m. - 8:30 p.m.; and Saturdays, 9:00 a.m. - 1:00 p.m.

Don't miss the Stephens Collection, which is located in a special room on the second floor of the library. Jack Baum supplies the following information about Fred Stephens and the collection: "Fred Stephens was born in Franklin around the turn of the century and at last report was living in Florida. He was raised in Franklin but following college worked elsewhere. As a keen and literate observer, he has recorded his memories of Franklin aided by a vast quantity of memorabilia which he has acquired over the years. The manuscript of his unpublished work on the area together with source materials is preserved in the Stephens Collection in a dedicated room in the Franklin Library. One may obtain the key to this room at the desk on the first floor during regular library hours. There are no borrowing privileges."

It is necessary to sign in and sign out when viewing the Sepsens Collection. Should you need photocopies of anything while you are in Franklin, the library has the photocopy machines available.

JLB