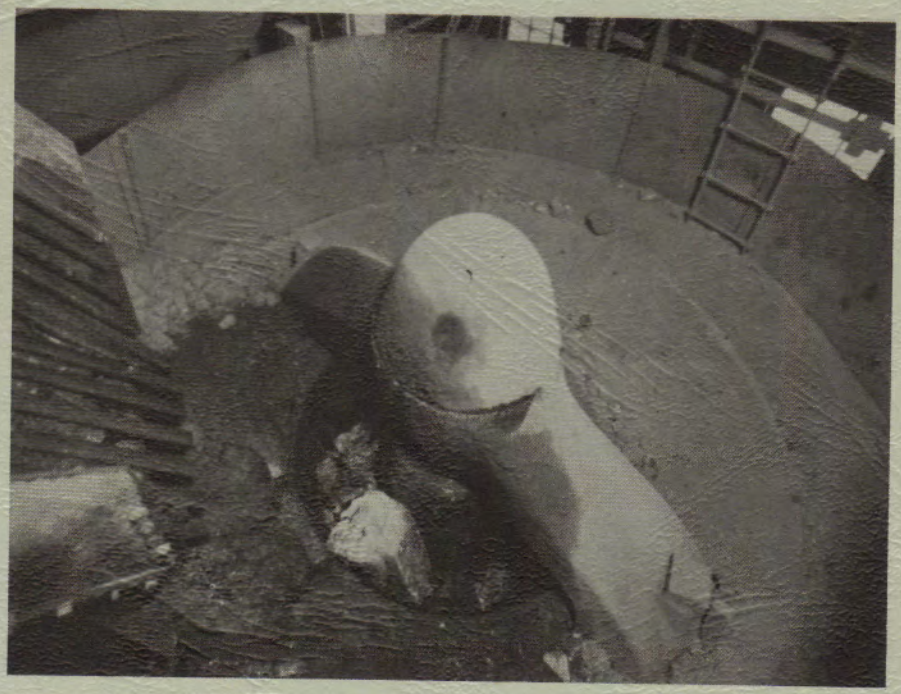
THE FIRST OF TWO

30TH

ANNIVERSARY

ISSUES

THE PICKING TABLE



JOURNAL of the FRANKLIN-OGDENSBURG MINERALOGICAL SOCIETY, INC.

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THE THIRTIETH ANNIVERSARY

The Society

The Franklin-Ogdensburg Mineralogical Society was founded in 1959 and the first issue of *The Picking Table* appeared in February, 1960. The Society's formation followed the closing of the Franklin Mine by five years and the publication of Palache's Professional Paper #180 by 24 years. The faces of the Society and *The Picking Table* have changed somewhat in the last thirty years. However, the purpose of the organization and its journal remain the same. To refresh your memory, the general purposes are: 1) To participate in the operation of a sound permanent museum for Franklin minerals in Franklin, NJ. 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 materials for future students and collectors. 6) To facilitate identification of Franklin minerals. 7) To promote fellowship and the advancement of both mineralogy and geology by providing meetings of those interested in the Franklin area. There are more purposes stated in the F.O.M.S. constitution but these provide the essence.

The Picking Table, **1**, #1, had Clifford Frondel's alphabetical list of validated mineral species from the Franklin-Sterling Hill area plus two last minute additions for a total of 172. The current *Picking Table*, **30**, #1, also features a splendid article by Clifford Frondel. Likewise, this issue has a mineral species list for the Franklin-Sterling Hill area. The confirmed list now amounts to 330 species plus 4 others, reported but unconfirmed. The Society's involvement in the Franklin Mineral Museum continues to grow as does its liaison with universities such as Harvard and Lehigh. The Society, with its parade of faces and talent, continues to follow a purposeful path.

The closing of the mine at Sterling Hill in early 1987 calls for some adjustment to our thinking. The challenge now is to place more emphasis on preservation of specimens and the recording of historical facts about the mines while it is still possible to do so. The intensity and dedication of the membership will meet this and future challenges.

Omer S. Dean, President, FOMS

The Science of Mineralogy in Year of our Founding

The year 1959 was also a period of diverse pursuits in mineralogy as scientists in England, Germany, Switzerland, and the United States continued the long tradition of research on the minerals of Franklin and Sterling Hill.

In London, England, L.C. Trumper published his report of the gemological characteristics of zincite. The crystal structure of Franklin rhodonite was published by F. Liebau of Berlin and his colleagues W. Hilmer and G. Lindemann. Meanwhile, in Zurich, W.Th.Epprecht was studying sussexite, and he published his results with American coworkers W.T. Schaller and A.C. Vlisidis.

Local studies were underway as well, and Sterling Hill brandtite was found and described by R.V. Gaines. John Albanese was very active at this time, publishing a paper on the metamorphic minerals of Franklin, and beginning his series of notes on the deposit, which he privately published from 1959-1961.

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Pete J. Dunn, Mineral Sciences
Smithsonian Institution

The
PICKING TABLE
Journal of the Franklin-Ogdensburg
Mineralogical Society, Incorporated

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THE COVER PHOTOGRAPHS

Only the chosen few had an opportunity to collect specimens directly from the "picking table". These views help one to visualize the scene. Just imagine the noise level! *(Counter-clockwise from top right)* The "picking table" during operations, Franklin Mine, Franklin, New Jersey. The discharge chute from the "picking table" to the gyratory crusher. The gyratory crusher receiving ore from the "picking table" via the discharge chute. All photographs are circa 1940. All are from the archives of the Franklin Mineral Museum. Our thanks to Bob Svecz, who has placed these photographs on loan to the museum.

HISTORY OF A CLASSIC:

Charles Palache's Monograph on the Minerals of Franklin and Sterling Hill, New Jersey

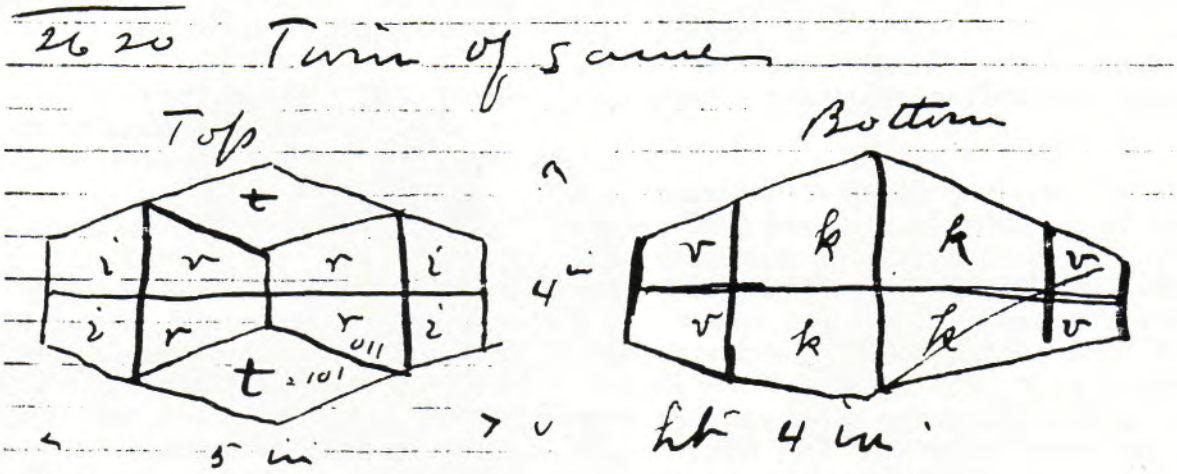
Clifford Frondel
Professor of Mineralogy, Emeritus,
Harvard University,Cambridge,MA

The year 1985 was the 50th Anniversary of one of the classics of American mineralogy, Charles Palache's description of the mineralogy and geology of the famous zinc mines at Franklin and Sterling Hill. It was published in 1935 by the United States Geological Survey as Professional Paper 180. The monograph still stands both as a model description of a mineral locality and as a virtual Bible to the collectors of the multitudinous minerals of the two mines.

In the Introduction to this work Palache remarks "Through a variety of circumstances unnecessary to enumerate, this study has extended over a period of 25 years". After Palache wrote these words, in the final version of the manuscript, there was an unanticipated further delay and the total elapsed time from inception of the project in 1906 to actual publication rose to 29 years. Palache was a reserved and sensitive person, not always communicative about his activities, and although his colleagues in the Department of Mineralogy and Petrology at Harvard University knew that the progress of his study over the years had met severe difficulties the detailed circumstances have remained quite unknown. Recently, the writer had occasion to go through Palache's professional correspondence, preserved in the archives of Harvard University, and extending from his appointment to Harvard in 1896 to his death in 1954. This revealed the full and sometimes startling history of his monograph, and led to the discovery of his personal notebooks covering the initial stages of his field work. The following account of Professional Paper 180 is drawn largely from these sources.

Palache's interest in the mineralogy of the Franklin and Sterling Hill mines was started by his older colleague Professor John Eliot Wolff, then Chairman of the Department of Mineralogy and Petrology. At the time of Palache's appointment in 1896 as Instructor in Mineralogy, Wolff had just begun a decade-long study of the Precambrian geology of northern New Jersey under the auspices of the U.S. Geological Survey. This soon established the fact, fundamental to an understanding of the Franklin area, that the so-called white limestone or Franklin formation was of Precambriam age and was not the metamorphosed equivalent of the so-called blue limestone or Kittatinny formation of Ordovician age as earlier thought. It also resulted in the publication in 1908 of Franklin Furnace Folio 161 of the Geological Atlas of the United States. This appeared under the authorship of A. C. Spencer, J. E. Wolff, H. B. Kummel, R. D. Salisbury, and Charles Palache. Folio 161 gave the first summary account of the geology and mineralogy of the Franklin and Sterling Hill mines and the surrounding area. It remained the standard reference work - today a collector's item - until the appearance of Palache's Professional Paper 180 and the redescription of the geology of the area published by J. M. Hague, J. L. Baum, L. A. Hermann and R. J. Pickering in 1956. Palache had been drawn into the preparation of Folio 161 as field assistant to Wolff. He contributed an annotated list of the 91 mineral species and varieties then known to occur in the area. This was Palache's first contribution to the mineralogy of Franklin and Sterling Hill. His list was gleaned from the literature and from local observations, and contained no new or original data.

Matters soon changed. In 1906, after work on Folio 161 had been completed, Wolff suggested to Palache that he make a detailed and comprehensive study of the minerals of the two mines under the auspices of the Geological Survey. Palache began immediately and spent the following three years in a virtually exhaustive examination of the existing private and public collections of Franklin and Sterling Hill minerals. Seventeen such collections in New Jersey, New York, and Pennsylvania are mentioned in the Introduction to Professional Paper 180 and others are indicated in his notebooks and correspondence. Among them are Yale University, where much of the early work on Franklin mineralogy



Perfectly symmetrical twin as above dull gray color in calcite same local

Figure 1. Hornblende. Noble Mine, Sterling Hill. Doubly terminated twin crystal; twin plane 100. Size 5 x 4 x 4 inches. Bement Collection.

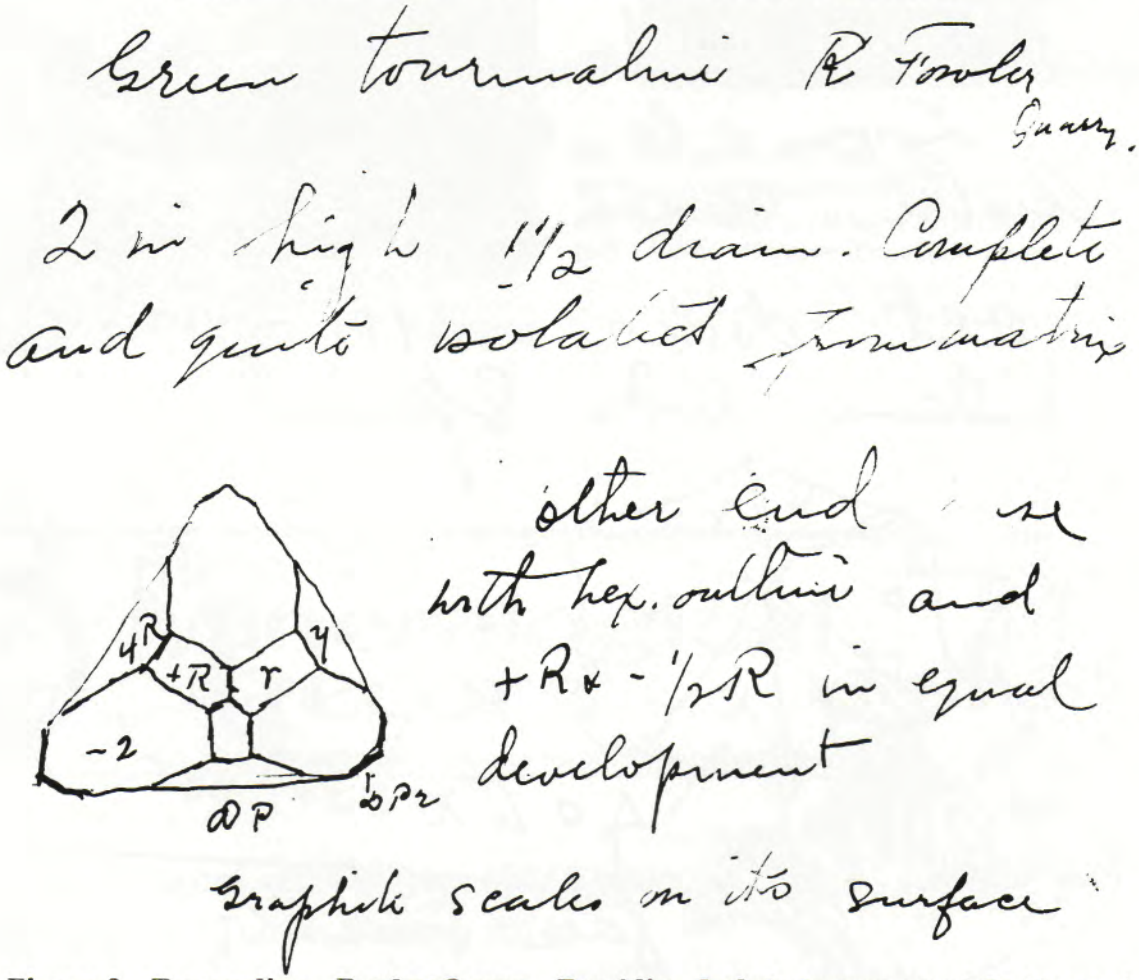


Figure 2. Tourmaline. Fowler Quarry, Franklin. Isolated green crystal. Bement Collection.

had been done, notably by J. D. Dana, G. J. Brush and Palache's close friend S. L. Penfield. He also examined the Franklin material in the Princeton, Rutgers, and Columbia mineral collections.

Palache's observations on these collections are detailed in his notebooks and are accompanied by skillful freehand sketches of unusual crystals that were observed (*Figures 1 - 5*). His travel expenses also are recorded and include items such as: horse and buggy $1.00; lunch and dinner Ogdensburg $1.00; Newton hotel $2.00; Pullman sleeper $2.00; carfare, newspaper and shoe shine $0.17; and numerous charges for cigarettes and beer. Some of his mineralogical notes follow:

Zincite. Buckwheat cut near dike (east side ?). Large crystals, most perfect 3½ cm long, 1½ cm through base. Best is simple pyramid looks steeper than Dana's figure. Shows no prism.

Leucophoenicite. Brilliant crystals of various habits, suggest orthorhombic symmetry, dull to clear red color, with one gem absolutely transparent raspberry red color that glows in yellow light like a bit of fire.

Spinel twin. Large and perfect model. 1 5/8 inch on edge, 1¼ inch perpendicular to twin plane. Dark color. From red spinel locality near Sparta.

Palache made no effort to examine the numerous specimens of Franklin and Sterling Hill material that had accumulated in European collections, notably in the Natural History Museums of London, Paris, and Vienna. A major source of this material was Francis Alger (1807-1863) of Boston, a part owner of the Franklin mine in 1844. He was a very active collector and dealer in Franklin minerals who "...spread the rare and unique minerals of the Fe and Zn mines of Sussex County broadcast over the mineralogical world" (cf. C. T. Jackson, 1864). Alger also wrote a major article on the Franklin Mine in 1845. Alger and Thomas Nuttall (who in 1822 wrote the first general account of the Franklin Mine, and also distributed specimens abroad) were the first to popularize the minerals of Franklin and Sterling Hill.

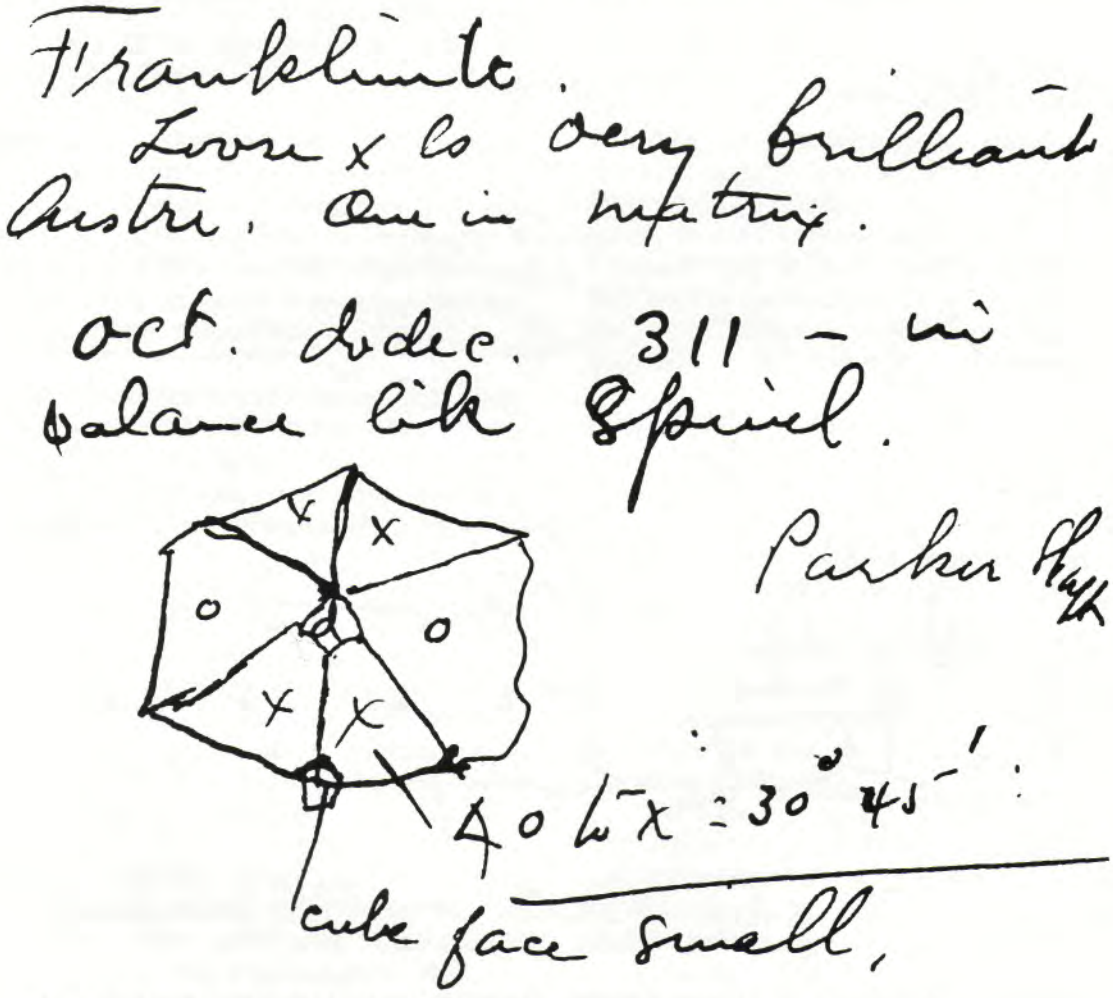


Figure 3. Franklinite. Parker Shaft, Franklin. Schuster Collection.

Another important source of information at this stage of Palache's project came from conversations with collectors familiar with the history of the mining operations during the latter half of the 19th Century. Among them were W. J. I. Kemble, F. A. Canfield, and E. P. Hancock. What was lacking in this early work and throughout the whole study was access to the mine workings to study the ores in place. This, and access to mine maps and to geological information in the hands of the New Jersey Zinc Company was denied as a matter of company policy that had been in effect long before (and long after) Palache's work. Palache apparently was underground at Franklin only once, although he did get to that virtually unreachable Mecca of visiting mineralogists, the picking table at the head of the mine shaft where the ores were sorted and waste material rejected. The picking table was the main source of specimens and study material, aside from material taken out by miners against Company regulations and then sold.

Following the completion of his work on private mineral collections Palache began the detailed description of specimen material in the Harvard laboratories. This was based on the already extensive and rapidly growing Harvard collection and on selected specimens borrowed or purchased from other collections. His project soon became generally known among American mineralogists and collectors and was virtually complete by 1917. In that year George F. Kunz, President of the New York Mineral Club, invited him to speak before the Club on the topic of 'The Minerals of Franklin and Sterling Hill, New Jersey'.

First Version of the Manuscript

Palache's manuscript was finally finished, so he thought, in 1919 and was submitted for publication to the U. S. Geological Survey on August 4th of that year. At the time Palache also resigned from his long extended appointment to the Geological Survey, never to be resumed. The manuscript was acknowledged by the Director of the Survey, George Otis Smith, and was passed on to A. C. Spencer, who put it aside, and then to F. L. Ransome for review and criticism. Hearing nothing after eight months Palache sent off an indignant letter in late March of 1920 requesting action. This soon came in the form of a rejection of the manuscript by

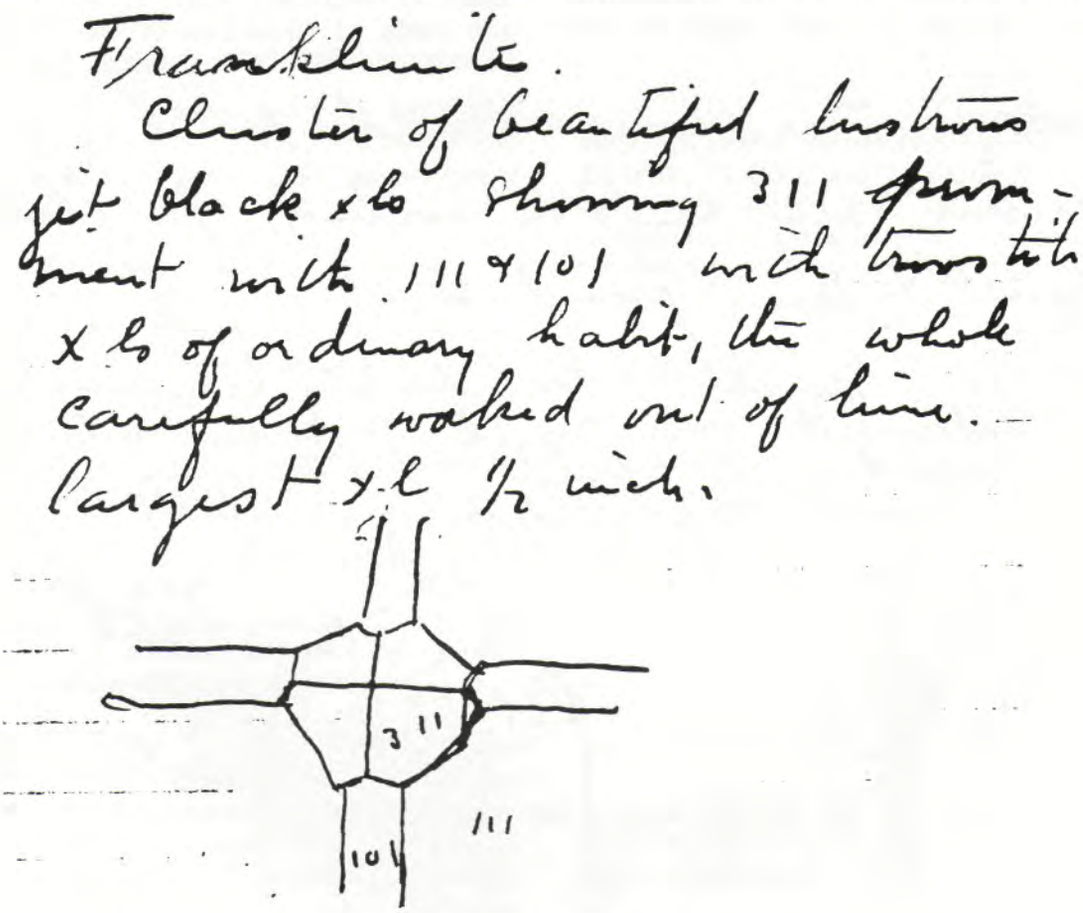


Figure 4. Franklinite. Franklin. McGovern Collection.

Ransome, whose criticism centered on Palache's theory of origin of the Franklin deposit. It was made clear, however, that a revised version of the manuscript would be welcome and that the Survey would provide funds for a further field study at Franklin. In June of 1920 Palache refused the offer of further support although he remarked that he looked forward "...to making a study in the future as will put my theory of the genesis of the Franklin deposit on a surer basis of observation." This was never done and his studies remained based wholly on hand specimens. Actually there was a wealth of maps and other information dealing with the internal structure, geology and mineralogy of the orebodies in the files of the New Jersey Zinc Company but this did not become available until the publication of the genetic study by this writer and J. L. Baum in 1974. It is not known just what Palache had to say about the genesis of the Franklin deposit, since the original manuscript is not extant, but it is very probable that it was the same view he later expressed in 1929 and 1935. Ransome, who had collaborated with Palache in the description of the new mineral lawsonite in 1896, was an authority in the general field of ore deposits, and certainly competent to criticize the rather speculative theories then existing for the origin of the Franklin deposit.

Final Version of the Manuscript

It was 11 years before Palache's revision of the 1919 manuscript was completed and re-submitted to the Geological Survey, on July 17, 1931. The new manuscript was entirely rewritten and much enlarged over the first version. During the 11 year interval over 60 publications on the mineralogy of Franklin and Sterling Hill had appeared in the literature, about half of them contributed by Palache and his associates at Harvard. This material was inserted in the manuscript. Additional new specimen material together with information on the ores and new chemical analyses also resulted from a close association of Palache with Lawson H. Bauer, Chief Chemist of the New Jersey Zinc Company at its Franklin laboratory. Bauer had a fine personal mineral collection, rich in type material and described material, that was later purchased and shared between Harvard and the U. S. National Museum.

A major factor that contributed to the long delay in finishing the revised manuscript was the growing diversion of Palache's time to teaching and research activities, with added administrative duties falling to him when, following the retirement of Professor Wolff in 1922, he took over the posts of Chairman of the Department and Curator of the Mineralogical Museum. Among

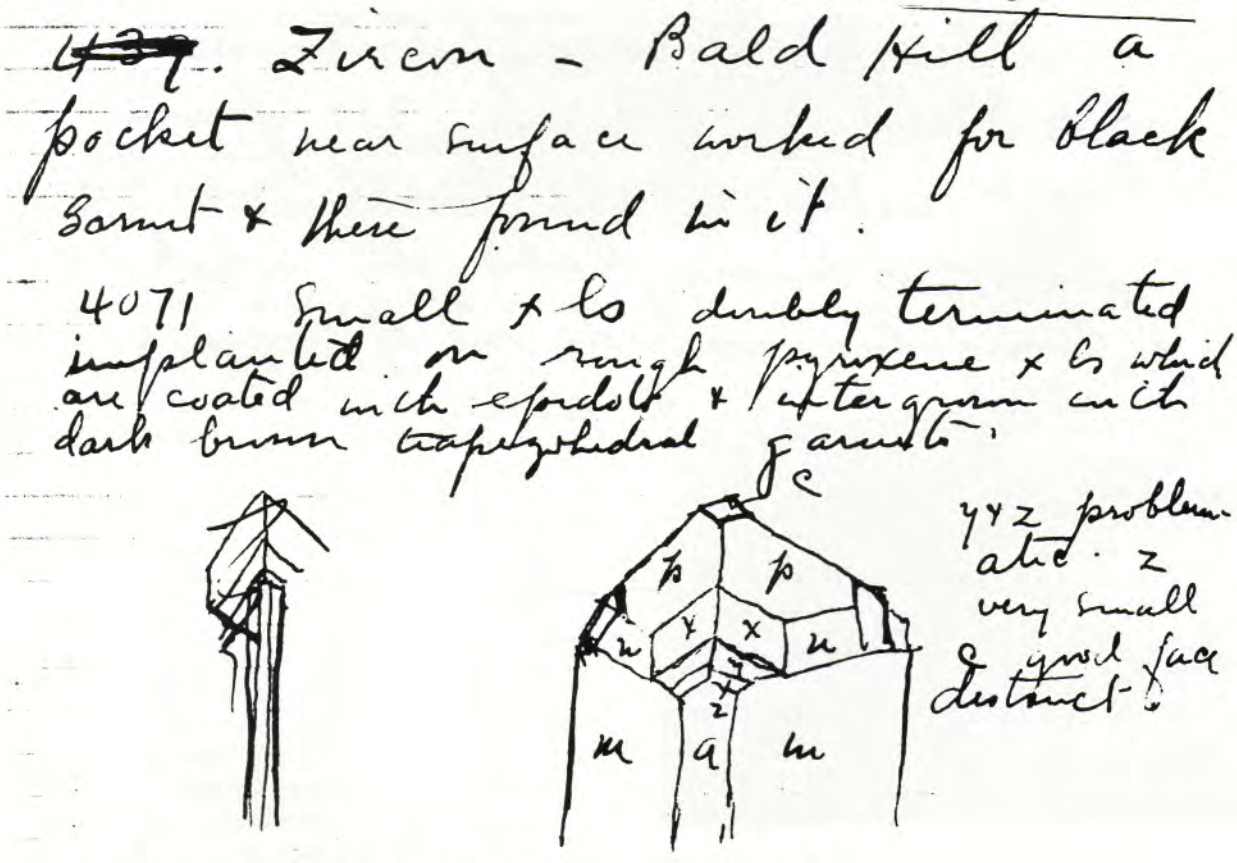


Figure 5. Zircon. Balls Hill, Franklin. Canfield Collection.

the major research projects that competed with his Franklin work during this period were an extended study by him and his students of the pegmatites of New England, beginning in 1912, a study of the Lake Superior copper deposits, beginning in 1920, and a notable series of publications dealing with the methodolgy of morphological crystallography.

When the revised manuscript arrived at the Geological Survey in 1931, it was turned over to Waldemar T. Schaller for review and criticism. Schaller was Chief Mineralogist of the Geological Survey and an authority in descriptive mineralogy and mineral chemistry. He made a lengthy and careful examination of the manuscript and, to Palache's dismay, made numerous new suggestions for further change, mostly of a crystallographic nature. At this point Palache decided that enough was enough, and he turned the final revision of the manuscript over to Laurence LaForge. He was a well known field geologist, who as a Harvard graduate student in 1903 had studied crystallogrphy with Palache with distinction. LaForge finished his rewriting of the text and the redrafting of crystal figures during 1932. The drawings were in pretty bad shape because, as Palache notes in a letter of July 1932, to C. W. Weckerly, Chief Illustrator of the Geological Survey, "...they had been made from time to time through the course of 25 years by different draftsmen with difficulty in getting anything like homogeneous results." The 1930s were a time of long and deep economic depression. A letter to Palache from the Director of the Geological Survey, W. C. Mendenhall, in November of 1931, comments on "...the great need for economy and the many demands on the publication funds to print reports already long delayed." Further, a projected color plate had to be withdrawn because of the cost. Finally, in 1935, 29 years after the project was initiated, Professional Paper 180 was published. It was worth the wait.

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The Epidote–Pyroxene–Fluorapophyllite Assemblage in the Franklin Mine at Franklin, New Jersey

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

A mineral assemblage from the mining area at Franklin, New Jersey, contains substantial amounts of epidote. The occurrence, which is sometimes in large masses, is composed mainly of crystalline yellow-green epidote and green to very dark green pyroxene (mostly hedenbergite), with smaller amounts of garnet and other minerals. It contains cavities with crystals of fluorapophyllite, ferroaxinite, pyrite, and numerous other species. Epidote also occurs in lesser amounts in the Franklin Mine itself, in a similar assemblage in the Sterling Mine, and in the magnetite deposits on Balls Hill southwest of Franklin. It has not been found, however, in the quarries in the Franklin marble.

Because the epidote-pyroxene-fluorapophyllite assemblage occurs in veins that run through several rock formations (including gneiss, pegmatites, and ore), it is associated with many minerals. The most interesting species include:

Actinolite
Dark green crystals and fibrous masses are common. They have been identified as actinolite by Palache (1935: p115).

Allanite
Allanite has been noted as distorted and incomplete black crystals embedded in masses of epidote with associated hedenbergite. The crystals usually have a brown "halo" around them. They are weakly radioactive.

Andradite (?)
Garnet is common in the epidote assemblage. It is usually in dark brown to red-brown masses. Small distorted crystals occur occasionally in vugs.

Calcite
Tiny secondary calcite (or aragonite?) crystals occur in the veins, and large pink or colorless masses of calcite are present on some of the epidote-hedenbergite specimens. Small amounts of calcite are present on most specimens.

Diopside (?)
On one specimen of massive epidote and garnet, the pyroxene is very pale green (in some areas nearly white). It has not been analyzed, but the color indicates it is probably diopside rather than hedenbergite (PPB, #6505).

Epidote
As Palache noted (1935: pp97-98), epidote at Franklin is usually associated with pegmatites in close proximity to the franklinite ore. In the massive epidote-pyroxene finds, the mineral varies from bright yellow-green to a duller green. Most specimens show evidence of more than one period of mineralization, with zeolites and other minerals crystallized in vugs. The epidote is occasionally beautifully crystallized, and prisms over half an inch in length may be present. One specimen is known with radiating sprays of crystals (FJP, #236X).

Ferroaxinite
Charles Palache described a find of "clove-brown axinite in minute crystals" found at the 600' level in the Palmer Shaft in a cavity with epidote, pyrite, garnet, and apophyllite crystals (1935: pp100 and 115). What may be similar material was found in recent years by Nick Rochester and other collectors at the Mill Site dump, as masses of epidote and hedenbergite containing vugs with tiny crystals of all these minerals (PPB, #6703).

Fluorapophyllite
Well-formed fluorapophyllite crystals occur in cavities in the epidote and pyroxene matrix, associated with crystals of ferroaxinite, natrolite, epidote, and pyrite. They are transparent and up to 4 mm long. Sometimes, they form rounded clusters of colorless crystals. Because the fluorapophyllite was one of the last minerals to form in the cavities, its crystals perch on the top of the other species to form particularly attractive specimens.

Fluorite
Rough octahedral crystals of fluorite occur in

Figure 1. White natrolite sprays perched on aggregrates of fluorapophyllite crystals in a vug. PPB 7219. Horizontal field = 12.65 mm.

a vein in gneiss, with epidote and fluorapophyllite. They are violet in color and up to 4 mm in size.

Galena
Cubic galena crystals up to 3 mm in size occur in a vein in gneiss, on prismatic epidote crystals (JC, #3065).

Goethite (?)
Occasionally, the pyrite crystals in the masses of epidote and hedenbergite have altered to dull, brown iron oxide. The main alteration product is most likely goethite.

Hedenbergite
Massive dark green to almost black hedenbergite occurs with crystalline masses of epidote, garnet, and other minerals. The pyroxene is a normal constituent of the assemblage when it occurs as large masses. An analysis of one specimen (PPB, #7219), by Dr. Pete J. Dunn, Smithsonian Institution, yielded the following percentages by weight: SiO_2 50.9; Al_2O_3 0.5; FeO 15.9; MgO 8.4; CaO 22.8; ZnO 0.2; MnO 0.9; Na_2O 0.6; Total 100.2 percent.

Heulandite (?)
Crystals which appear to be heulandite occur on one vein specimen (FMM-K).

Natrolite
Beautiful white tuffs of hair-like crystals occur in cavities in a matrix of massive epidote and hedenbergite and in epidote veins in pegmatite. One specimen has been identified as natrolite (PPB, #7219). The verified natrolite is in vugs in epidote and hedenbergite, associated with fluorapophyllite crystals. Dark brown garnet, pink calcite, and pyrite are present, and tiny zircon crystals are enclosed within the hedenbergite.

Pyrite
Crystals and masses of pyrite are common in the assemblage, occurring as inclusions within the epidote-hedenbergite matrix as well as in cavities. Pyrite is not present when the pyroxene is very pale green.

Quartz
Quartz occurs occasionally as euhedral colorless crystals (MWB, #100). Small masses are often enclosed within the massive epidote and pyroxene rock.

Stilbite (?)
Palache reported a find of indistinct stilbite crystals on epidote, with actinolite, in a cavity in feldspar (1935: p115). Unanalyzed crystals which may be stilbite occur with the fluorite mentioned above.

Titanite (?)
Lustrous dark brown crystal sections up to one centimeter across, in a matrix of epidote and dark green pyroxene associated with allanite and a small amount of calcite, yield an X-ray pattern near titanite.

Zircon
Brown zircon crystals about one millimeter in length occur within the hedenbergite on a specimen consisting of bright yellow-green epidote and dark green hedenbergite containing vugs with natrolite and other minerals (see natrolite, above).

Acknowledgments
Thanks are extended to the following persons for assistance, advice, and information on specimens: Michael Betancourt, Richard Bostwick, Joseph Cilen, Warren Cummings, George Myer, Fred J. Parker, Nick Rochester, and Steve Sanford.

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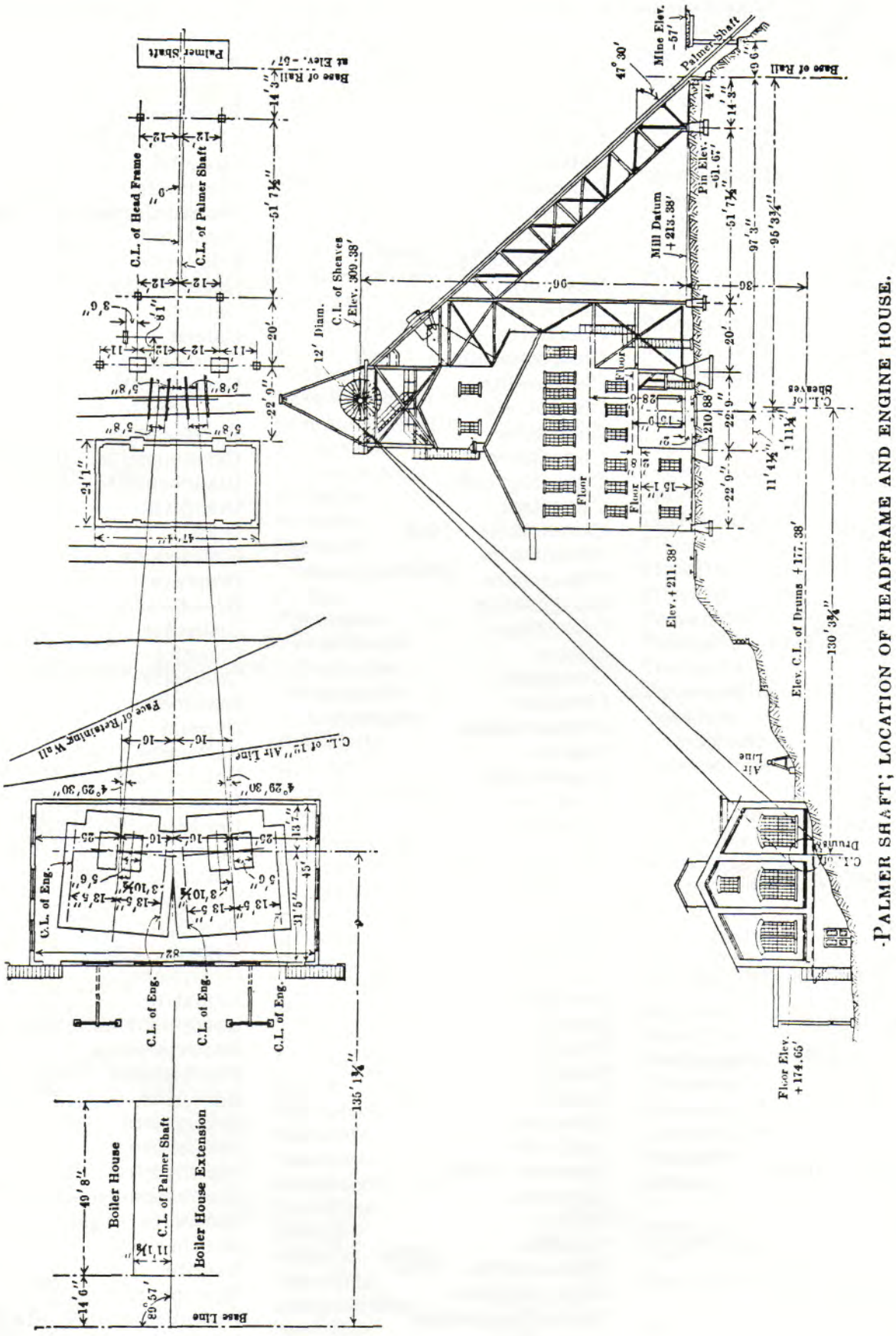
APPENDIX

Species	Method of Verification	Reference or Validated Specimen
Actinolite	Not Stated	Palache (1935); page 115
Allanite	XRD (2); radioactivity	PPB,#8289
Andradite (?)	XRD (2)	PPB,#6505
Calcite	XRD (1)	PPB,#7219
Diopside (?)	Visual ID	PPB,#6505
Epidote	Not stated	Palache (1935); pages 97-98
Ferroaxinite	XRD (3)	PPB,#6703
Fluorapophyllite	Visual ID	Numerous specimens
Fluorite	Visual ID	PPB,#5328
Galena	Visual ID	JC,#3065
Goethite (?)	Visual ID	Numerous Specimens
Hedenbergite	Visual ID	Numerous Specimens
Heulandite (?)	Visual ID	FMM-K
Natrolite	XRD (1)	PPB,#7219
Pyrite	Visual ID	Numerous Specimens
Quartz	Visual ID	MWB,#100 & Numerous Others
Stilbite (?)	Not Stated	Palache (1935); page 115
Titanite (?)	XRD (2)	PPB,#8289
Zircon	XRD (1)	PPB,#7219

Key to abbreviations used in above Table and in the text
XRD - X-ray diffraction
(1)- Dr. Pete J. Dunn, Smithsonian Institution
(2)- George H. Myer, Temple University
(3)- Fred J. Parker
FMM-K - The Franklin Mineral Museum, Kraissl Collection
FJP - Fred J. Parker Collection
JC - Joseph Cilen Collection
MWB - Michael W. Betancourt Collection
PPB - Philip P. Betancourt Collection



PALMER SHAFT; LOCATION OF HEADFRAME AND ENGINE HOUSE.

THE FRANKLIN-STERLING HILL AREA MINERAL SPECIES LIST (12/31/88)

Key: Species followed by dates were first described from this area during the year indicated. Species in boldface type remain unique to the area. An asterisk indicates further confirmation is required.

Acanthite
Acmite
Actinolite
Adamite
Adelite
Akrochordite
Albite
Allactite
Allanite-(Ce)
Alleghanyite
Almandine
Analcime
Anandite
Anatase
Andradite
Anglesite
Anhydrite
Annabergite
Anorthite
Anorthoclase
Antigorite
Aragonite
Arsenic
Arseniosiderite
Arsenopyrite
Atacamite
Augite
Aurichalcite
Austinite
Azurite
Bakerite
Bannisterite -1968
Barite
Barium-pharmacosiderite
Barylite
Barysilite
Bassanite
Bastnaesite-group mineral
Baumhauerite
Baumite -1975
Bementite -1887
Berthierite
Biotite
Birnessite
Bornite
Bostwickite -1983
Brandtite
Brochantite
Brookite
Brucite
Bultfonteinite
Bustamite
Cahnite -1927
Calcite
Canavesite
Carrollite
Caryopilite
Celestite
Celsian
Cerussite
Chabazite
Chalcocite
Chalcophanite -1875
Chalcopyrite
Chamosite
Charlesite -1983
Chlorophoenicite -1924
Chondrodite
Chrysocolla
Chrysotile
Clinochlore
Clinochrysotile
Clinoclase
Clinohedrite -1898
Clinohumite
Clinozoisite
Conichalcite
Connellite
Copper
Corundum
Covellite
Cryptomelane
Cuprite
Cuprostibite
Cuspidine
Datolite
Descloizite
Devilline
Digenite
Diopside
Djurleite
Dolomite
Domeykite
Dravite
Dypingite
Edenite
Epidote
Epsomite
Erythrite
Esperite -1965
Euchroite
Eveite
Fayalite
Feitknechtite -1965
Ferrimolybdite
Ferristilpnomelane
Ferro-axinite
Flinkite
Fluckite
Fluoborite
Fluorapatite
Fluorapophyllite
Fluorite
Forsterite
Franklinfurnaceite -1987
Franklinite -1819
Friedelite
Gageite -1910
Gahnite
Galena
Ganomalite
Ganophyllite
Genthelvite
Gersdorffite
Gerstmannite -1977
Glaucochroite -1899
Goethite
Gold
Goldmanite
Graphite
Greenockite
Grossular
Groutite
Grovesite
Guerinite
Gypsum
Halloysite *
Halotrichite
Hancockite -1899
Hardystonite -1899
Hastingsite
Hauckite -1980
Hausmannite
Hawleyite
Hedenbergite
Hedyphane
Hematite
Hematolite-like-mineral
Hemimorphite
Hendricksite -1966
Hercynite
Hetaerolite -1877
Heulandite
Hexahydrite
Hodgkinsonite -1913
Holdenite -1927
Huebnerite
Humite
Hyalophane
Hydrohetaerolite -1935
Hydrotalcite
Hydroxyapophyllite

Hydrozincite
Illite
Ilmenite
Jacobsite
Jarosewichite -1982
Jerrygibbsite -1984
Johannsenite -1938
Johnbaumite -1980
Junitoite
Kaolinite
Kentrolite
Kittatinnyite -1983
Koettigite
Kolicite -1979
Kraisslite -1978
Kutnohorite
Larsenite -1928
Laumontite
Lawsonbauerite -1979
Lead
Legrandite
Lennilenapeite -1984
Leucophoenicite -1899
Linarite
Liroconite
Lizardite
Loellingite
Loseyite -1929
Magnesiohornblende
Magnesioriebeckite
Magnesium-chlorophoenicite-1924
Magnetite
Magnussonite
Malachite
Manganaxinite
Manganberzeliite
Manganese-hoernesite
Manganhumite
Manganite
Manganosite
Manganpyrosmalite -1953
Marcasite
Margarite
Margarosanite -1916
Marsturite -1978
Mcallisterite
Mcgovernite -1927
Meionite
Melanterite *
Metalodevite
Metazeunerite
Microcline
Mimetite
Minehillite -1984
Molybdenite
Monohydrocalcite
Mooreite -1929
Muscovite
Nasonite -1899
Natrolite
Nelenite -1984
Neotocite
Newberyite
Niahite
Nickeline
Nontronite
Norbergite
Ogdensburgite -1981
Ojuelaite
Orthoclase
Orthochrysotile
Orthoserpierite
Otavite
Oyelite-like-mineral
Parabrandtite -1987
Pararammelsbergite
Parasymplesite
Pargasite
Pectolite
Petedunnite -1987
Pharmacosiderite
Phlogopite
Picropharmacolite
Pimelite
Powellite
Prehnite
Pumpellyite-(Mg)
Pyrite
Pyroaurite
Pyrobelonite
Pyrochroite
Pyrophanite
Pyroxmangite
Pyrrhotite
Quartz
Rammelsbergite
Realgar
Retzian-(La) 1984
Retzian-(Nd) -1982
Rhodochrosite
Rhodonite
Richterite
Riebeckite
Roeblingite -1897
Romeite
Rosasite *
Roweite -1937
Rutile
Safflorite
Sarkinite
Sauconite
Schallerite -1925
Scheelite
Schorl
Sclarite -1989
Scorodite
Seligmannite
Sepiolite
Serpierite
Siderite
Sillimanite
Silver
Sjogrenite
Skutterudite
Smithsonite
Sonolite
Spessartine
Sphalerite
Spinel
Starkeyite
Sterlinghillite -1981
Stilbite
Stilpnomelane
Stilpnomelane (Mn-dominant)
Strontianite
Sulfur
Sussexite -1868
Svabite
Synadelphite
Talc
Tennantite
Tephroite -1823
Thomsonite
Thorite *
Thortveitite
Tilasite
Tirodite
Titanite
Todorokite
Torreyite -1929
Tremolite
Turneaureite -1985
Uraninite
Uranophane
Uranospinite
Uvite
Vesuvianite
Villyaellenite
Wallkilldellite -1983
Wendwilsonite -1987
Willemite -1824
Wollastonite
Woodruffite -1953
Wulfenite
Wurtzite
Xonotlite
Yeatmanite -1938
Yukonite
Zinalsite -1958
Zincite -1810
Zinkenite
Zircon

TOTALS:

Confirmed species--	330
Species requiring further confirmation--	4
Species first described from area--	66
Species unique to area--	34

In Memoria

SUNNY COOK (1899-1985)

Ethel Maxine Packard was born in Brooklyn, New York City on January 15, 1899. At the age of six months her family moved to Upper Montclair, New Jersey. She lived there until her tenth birthday, at which time the family established a large chicken farm in Hammonton, New Jersey. Known as "Sunny", she lived there until October 20, 1923 when she was married to Charles C. Cook, a marriage that lasted twenty-five years. There were two daughters, Phyllis and Natalie, and a son, Carlton. During her married years, Sunny was especially interested in writing short stories, a successful occupation initiated by her winning first prize in a world-wide Camp Fire Girls' short story contest. In 1948 she moved to California to get a divorce and make a home for her son Carlton, who was working on getting his Master's degree.

While in California, Sunny was introduced by friends to lapidary and jewelry work, and at a gem show saw fluorescent Franklin minerals for the first time. Despite the years of residence in New Jersey she had not heard of Franklin. Returning to the east coast in 1951 she was eager to start a collection. Her cousin, Alden Perry Armagnac, an editor for *Popular Science* magazine, accompanied her on her expeditions to Franklin and the two of them became a familiar sight visiting mineral sources. He was reserved and distinguished, with an ever-present camera, and she full of energy, smoking like a chimney and radiating enthusiasm.

At an Eastern Federation show in Washington, Sunny met Tom Warren for the first time, helped him with his displays and impressed him with her knowledge to the point where he invited her to come out and identify Franklin minerals for his concern, Ultra Violet Products, Inc. She was there for three years. She described the work as pure delight. To be near Franklin, Sunny took a job as assistant house-director at Blair Academy, a boy's preparatory school at Blairstown, New Jersey.

Sunny's collection was two-fold: a large number of cabinet specimens, well shaped and clean, and strong in the spectacular fluorescent specimens as well, largely Franklin but not exclusively so; and an assemblage of smaller specimens selected to illustrate Palache's Professional Paper 180, each a choice example, and which she took with her when she retired from Blair. The remainder she donated to the Franklin-Ogdensburg Mineralogical Society in trust for the Franklin Mineral Museum where the greater part of it has been on display since the opening in 1965, one of the two collections that got the museum off to a good start. Hauling Sunny's collection in boxes of all sizes through the corridors and stairwells of the school was a memorable experience.

Following her retirement from the school, Sunny moved to a farm at Barre, Massachusetts owned by her daughter, Phyllis, where she had her own quarters and could garden as she wished and entertain family members and occasional visitors from the old days. Her eyesight was not great, but she kept up her correspondence as long as she was able and continued smoking her two packs a day of unfiltered Luckies or Camels. Her special collection of Palache specimens she ultimately gave to Dick Bostwick. She first met Dick during his senior year (1960-61) at Blair Academy and they remained close friends from then on. Later in their careers, they both worked for Tom Warren at Ultra Violet Products.

Ultimately, Sunny Cook, mother of three, became grandmother of fourteen and great-grandmother (at this writing) of seventeen. The impact on collectors through her gift to the Franklin Mineral Museum is yet spreading among younger generations. She went to her reward on October 29, 1985.

Jack Baum (11/12/88)

* * * * *

It is to Sunny Cook that I owe my awareness of and interest in fluorescent and Franklin minerals, and much of my effort in documenting, collecting, and promoting them is a continuation of her work. She was the first "grown-up" (being one month younger than my father) with whom I had a lasting friendship -- we were able to discuss virtually anything except politics (she was an Eisenhower/Nixon Republican and I was not), and my correspondence with and visits to her were a source of pleasure and encouragement for 25 years. The 44 years' difference

in age never was a barrier to this friendship, but the ageless quality of her mind and her unquenchable enthusiasm would have bridged much wider gaps.

Dick Bostwick (11/25/88)

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HENRY MORTON ALTHOEN (1899–1988)

Henry Morton Althoen was born March 15, 1899 in Waterbury, Connecticut. His father's parents came from Germany and his mother's parents, the Mortons, were Southerners. Henry was known as Morton to his relatives because his father was Henry also. At the age of ten, Henry's family moved to New Jersey, and when he was thirteen they moved into the home in Dunellen, N.J. (the same home in which his days ended on September 9, 1988). He attended the local school through high school and then went to work, ultimately being with A.T.& T. for 46 years. During that time he took courses in electronics and communications in colleges convenient to his work, such as at Milwaukee and the University of Illinois. He retired at age 65 but such was the demand for his special talents in establishing communication systems for business and industry that he was invited to return to work as consultant. This work took him at various times for extended periods to Washington state, California, Florida, and to Rochester, N.Y. Henry Althoen was married three times. There were three children, the first, a daughter by his first wife who died in childbirth, and a son and daughter by his second wife. His last wife, Betsy, of Swiss descent, maintained his home in Dunellen to which they returned in due time, and stayed home while they pursued his second career following retirement. She is a remarkable woman and a delight to know. She has given Henry's Franklin mineral collection to the Franklin Mineral Museum.

Henry Althoen became interested in minerals about the time the Plainfield, N.J. mineral club was founded and apparently was an early member. He was especially interested in organization, and those who worked with him soon found themselves with assignments. His collection was well catalogued and labelled, the smaller specimens each in a clear plastic box on styrofoam, and the origin of each clearly given. Much of the material on display was purchased, and many old collections represented. The Franklin Mineral Museum is indebted to Betsy Althoen for this generous gesture. Henry went on field trips to other mineral localities and visited fossil localities as well. He was possibly as interested in the people he met as he was in collecting. Joining the New Jersey Audubon Society he became ultimately its President, during which time he attempted to instill in the members an interest in mineralogy, to the extent of placing a Franklin mineral collector on the Board of Trustees. The annual meetings and bird outings at Cape May and Atlantic City were a senior citizens' delight with good food, innocuous lectures and boat trips close to shore.

Henry Althoen was a member also of a business mens' luncheon club called the Old Guard in which he took much pleasure. They all seemed to be long retired, and it was they who conducted the final ceremonies. Henry was a kind and generous friend to all he met and Franklin mineralogy was, like all his interests, well served.

Jack Baum (11/17/88)

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Mineral Notes

Research Reports

Ganophyllite

"A re-examination of the structure of ganophyllite" is the title of an article which appeared in Mineralogical Magazine, (1986) Vol. 50, pp307-315. The authors are Richard A. Eggleton, Geology Department, Australian National University, Canberra, ACT, Australia, and Stephen Guggenheim, Dept. of Geological Sciences, University of Illinois, Chicago, IL 60680. The authors' abstract of the article follows.

The superstructure of ganophyllite has been analyzed using subcell single crystal X-ray data and electron-optical observations. The full cell (supercell), space group $A2/a$, a=16.6, b=26.6, c=50Å, β=94°, has the approximate formula $(K,Na,Ca)_6^{+7.5}(Mg,Fe,Mn)_{24}[Si_{32.5}Al_{7.5}]O_{96}(OH)_{16}\ 21H_2O$, Z=8. A structure is proposed in which triple chains of silica tetrahedra parallel to X form narrow 2:1 layers with sinusoidal Mn-octahedral sheets. The triple chains are connected laterally, and across the interlayer, by pairs of inverted tetrahedra, linking each other into four-member rings parallel to (010). Polytypes are generated by various displacements of the inverted tetrahedra.

[*Editor's Notes: 1) The measured density of Franklin ganophyllite was found to be 2.810 (±0.01) g/cm^3, a value unchanged after heating to 35°C in vacuum for 1½ hours. This differs from the Dunn et al. (1983) measured density of 2.77 (±0.04) g/cm^3 for ganophyllite from Franklin. 2) The predicted tetrahedral to octahedral ratio based on the study's model is 80:48. Franklin and Pajsberg ganophyllites are in close agreement with these predicted values; Franklin ratio 78.7:47.1 and Pajsberg 79.0:48.1. 3) The new formula for Franklin and Pajsberg ganophyllites appears in the authors' abstract above.*]

* * * * * * * * * *

Ganophyllite

An article entitled "Cation exchange in ganophyllite" written by Stephen Guggenheim, Dept. of Geological Sciences, Univ. of Illinois, Chicago, IL 60680, and Richard A. Eggleton, Geology Dept., Australian National University, Canberra, ACT, Australia, appeared in the Mineralogical Magazine, (1986) Vol. 50, pp517-520. The following is the authors' abstract of that article.

Ganophyllite has been shown to have alkali cation exchange capability. Partial cesium exchange for K + Na in large (>0.3 mm) grains shows that the exchangeable cations migrate parallel to X, the crystallographic direction for the "interlayer" tunnels. Such exchange capability supports the suggestion that the alkali elements are located in zeolite-like sites attached to the sides of the tunnels. Exchange experiments show that complete sodium substitution for potassium is possible also. Eggletonite, the Na analogue of ganophyllite, is shown to have an identical superlattice to ganophyllite, indicating that eggletonite differs from ganophyllite only by the exchangeable cation.

[*Editor's Note: Points of specific interest, not included in the authors' abstract above, have been abstracted and appear below.*]

Precession photographs of crystals of Franklin, NJ ganophyllite (H-82837), confirmed its identity, its monoclinic subcell, and its supercell dimension along X. More complete characterization was prevented by crystal twinning.

For use in the cation exchange experiments, the Franklin ganophyllite had to be crushed into fragments measuring about 0.3 mm. Fragments this size slow the exchange but permit the crystallographic direction of cation movement to be determined by X-ray or microprobe analysis. For the first set of experiments, fragments were placed in a 0.1 N solution of CsCl. Samples were taken after one, 17, and 50 days, respectively. During the first 17 days, the solution was agitated constantly. Ganophyllite fragments retrieved from the solution were washed repeatedly in distilled water and acetone and then mounted and sectioned for chemical analysis. The second set of experiments had the Franklin ganophyllite fragments placed in a 1 N solution of NaCl, the solution agitated constantly, and fragments retrieved at one week intervals.

The electron diffraction data suggest that the alkali elements are not imperative for development of the superstructure, and thus, raise doubts about the validity of the Kato (1980) subcell model for ganophyllite. A Cs distribution map of a partially exchanged grain (fragment) was in good agreement with the predicted direction of cation migration. By contrast, cations should not be readily exchangeable in Kato's model due to the high residual negative charge associated with the O(5) oxygen(s) coordinating to the alkali site.

The second experiment results indicate that sodium exchange was rapid and nearly complete (even for large grains). Na exchanged for K was consistent with a 1:1 replacement. Calcium content did not appear affected by the exchange reaction, which may be related to differences in cation charge, size, or state of hydration. The authors suggest that the charge associated with total alkali content may be related to aluminium content in ganophyllite; however, such a conclusion is tentative without further data.

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Bustamite & Rhodonite

An article entitled "Lattice expansion and ionic substitution in common pyroxenoids" appeared in Contrib. Mineral. Petrol.,Vol.94 (1986), pp238-244. The authors are Krishnamoorthy Viswanathan and Otto Harneit, Mineralogisches Institut der Technischen Universitat, Gaußstraße 28 29. D-3300 Braunschweig, Federal Republic of Germany. The following is the authors' abstract of that article.

A study of the behavior of the lattice constants of common pyroxenoids and pyroxenes, especially bustamites and rhodonites, reveals that calcium causes the lattices of pyroxenes and rhodonites to expand more anisotropically than those of bustamites or wollastonites. Thus, the chain silicates are characterized by two different types of expansion. In the second part of the paper an attempt is made to correlate the chemical compositions and unit cell parameters of bustamites and rhodonites using the data of 14 bustamites and 33 rhodonites, most of which were investigated in this work. In the case of bustamites, the chemical composition can be determined using the lattice parameters, β, and d_{100}. In the case of rhodonites, the amount of calcium can be determined very accurately, and that of magnesium can be estimated to an accuracy of 3-4 mole-%.

[Editors Note: Although Franklin and Sterling Hill are not referred to in this article, some of the material studied is from that area. Within the article three items of interest are: 1) Quote of P.J. Dunn's opinion (pers.comm.) that Mg-rich natural bustamites with more than 1.5 wt% MgO are very rare. 2) Quote of P.J. Dunn's comment that considerable amounts of zinc (about 8% $ZnSiO_3$) are likely to be present in bustamite, if it occurs in a zinc-rich environment as indicated by the presence of minerals such as willemite. 3) Some rhodonites associated with zinc-containing minerals show appreciable amounts of $ZnSiO_3$ (up to 8-10 Mole-%). Such rhodonites possess large values for β-angle (>103.6°) and can, therefore, be distinguished. Although calcium content can be determined using d_{100} in Fig. 5, the amounts of other elements (Zn, Mg, Fe, and Mn) cannot be determined.]

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Nasonite

Recently an article appeared in Acta Cryst. B43 (1987) pp 171-174, entitled "Detection of non-hexagonal symmetry in an apatite-structure-related mineral (nasonite)." The authors are: E.F. Bres and J.-C. Voegel, Unité de Recherche INSERM U157, UFR d'Odontologie, 1 place de l'Hôpital, 67000 Strasbourg, France; W.G. Waddington and J.L. Hutchison, Department of Earth Sciences, University of Oxford, Oxford, OX1 3PR, UK; S. Cohen and I. Mayer, Department of Inorganic and Analytical Chemistry, the Hebrew Univ. of Jerusalem, 91 904, Jerusalem, Israel. The following is the authors' abstract of that article.

An analysis of nasonite by high-resolution electron microscopy (HREM) has shown: (*a*) a loss of the twofold screw axis in the structure, and (*b*) a deviation from hexagonal symmetry. These results have been checked with a series of computer calculations which show the absence of artefacts in the imaging process. An X-ray structure determination of the same specimen has been carried out resulting in space group $P6_3/m$ which is in contradiction with the HREM findings. It is suggested that the differences in results between the HREM and the X-ray diffraction techniques arise from the presence of phase microdomains inside the original crystal, although no crystal domain showing a hexagonal structure was observed using HREM.

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Chalcophanite

An article entitled "Some observations on the chemical composition of chalcophanite" appeared in Mineralogical Magazine (1985) Vol.49, pp 752-757. The author is J. Ostwald, The Broken Hill

Proprietary Company, Ltd., Central Research Laboratories, Shortland, NSW, Australia. The following is an abstract of that article.

Introduction. Chalcophanite, a manganese oxide layer-lattice mineral, is somewhat common in the weathering zones of Mn-containing base metal deposits. The type material (Sterling Hill, NJ) contains appreciable amounts of Zn (Moore, 1875). Palache *et al.*(1944) suggested the formula $(Zn,Mn,Fe)Mn_2O_5 \cdot 2H_2O$, assuming Mn^{2+} substitutes for Zn about Mn:Zn = 1:3 and Fe^{2+} substitutes for Zn to about Fe:Zn = 2:3. Wadsley's study (1955) of Sterling Hill chalcophanite, containing divalent Mn, indicated a general formula

$(Zn,Mn^{2+})_{1+x}(Mn_{3-x}^{4+}Mn_x^{2+})O_7 \cdot 3H_2O$

with x ranging from 0 to 0.25. Wadsley found the cell structure was composed of layers of edge-shared ($Mn^{4+}O_6$) octahedra and single sheets of water molecules between which Zn^{2+} ions were situated.

Chalcophanite is triclinic, space group $P\bar{1}$, a_o=7.54, b_o=7.54, and c_o=8.22Å, α=90°, β=117.2°, γ=120°, and Z=2.

Greater chemical variation occurred in later studies. Thus, there is abundant evidence that chalcophanite is more complex than is suggested by the formula in Fleischer (1983). The purpose of the article is to point out the need for a revised formula. Electron probe microanalyses do not allow valence state determinations nor those for water or hydroxyl. Hence, the authors make no attempt to present a new formula.

Specimen locations. Eight specimens, of 30 studied, were from Sterling Hill, NJ. Five other localities were included in the study. These include: Groote Eylandt; Norseman, Western Australia; Buchan, Victoria, Australia; Kambalda area, Western Australia; and Lake Macquarie, New South Wales.

Results. Samples were examined by XRD and by FTIR (Fourier Transform Infra-Red spectroscopy). The FTIR spectrum of chalcophanite was very characteristic, having 4 sharp absorption peaks in the region 400-500cm^{-1}, and OH peaks at 1620 cm^{-1} and at 3300-3400 cm^{-1} (Potter & Rossman, 1979). A constancy in the IR spectrum, irrespective of quite gross changes in chemical composition, was demonstrated by the data.

Discussion. The EPMA of chalcophanite (See Table 1 for Sterling Hill data only) suggest that certain aspects of chalcophanite mineralogy need further consideration. The analyses, carried out on areas of optically homogeneous chalcophanite, often show amounts of Al and/or Si. Also, the chalcophanite crystals were often associated with clays and quartz. Examination of powder from polished sections by transmission electron microscopy and semi-qualitative analysis using an X-ray energy dispersive spectrometer were performed on Norseman, West Australia chalcophanite. The results indicate that the Al and Si are probably not clay or quartz contaminants. The analyses also cast doubt on chemical variations in the mineral being the result of isomorphous substitution (Frenzel,1980). If Al and Si are actually constituents of chalcophanite, even at low concentrations, it is difficult to see how these elements could be isomorphous replacements of Mn^{4+}, Mn^{2+}, or Zn^{2+} in the layer-lattice and in relation to minimum levels of non-manganese elements in the manganese oxide structure. One explanation of the above is that chalcophanite may not be a single structure mineral but a hybrid composed of irregular mixed layers of a well-defined tetravalent manganese oxide layer lattice with 7.1 A basal reflection, and one or more series of 'islands' of other structures. Ostwald (1981) concluded that chalcophanite may result from the topotactic metasomatism of kaolinite by manganese ions. Incomplete replacement could create relicts of Al-Si lattice coherently intergrown with host manganese oxides. Such a relict would not be gangue inclusions but actual components of a hybrid mineral. The constant X-ray diffraction and IR characteristics, accompanying the variable chemistry, for chalcophanite are explained by the existence of such a hybrid structure. High resolution transmission electron microscopy (HRTEM) and select area electron diffraction (SAED) studies may provide further elucidation.

Table 1. Electron Probe Microanalyses of Sterling Hill Chalcophanite (Wt.%)

MnO_2 Low 62.3,High 65.3; NiO nd(8)*;

ZnO Low 20.1,High 22.1; Fe_2O_3 nd(3),High 0.3;

CuO nd(6),High 0.2; CoO nd(7),High 0.2;

CaO nd(5),High 0.3; MgO nd(6),High 0.5;

K_2O nd(6),High 0.3; BaO nd(7),High 0.3;

Al_2O_3 nd(7),High 0.3; SiO_2 nd(6),High 0.4;

H_2O (by Difference) Low 12.4,High 17.2

*nd=none detected; ( )=specimens yielding nd

from the Editor's Desk

Omer S. Dean
10 Bumble Bee Lane
Norwalk, CT 06851

Steve Sanford Update
Steve Sanford, Manager of the Franklin Mineral Museum, suffered a stroke in late November. His condition has improved considerably and he has been moved to a rehabilitation center in Wilkes-Barre. He very much enjoys receiving cards and letters. Please remember, however, that his condition prevents him from replying to your correspondence. His address is:

Stephen Sanford
HCR 20-4,
Greeley, PA 18425

FOMS Mineral Photography Contest
The black and white mineral photograph contest announced in the last issue has been cancelled because of lack of interest. There was a single entry as of the deadline.

30th Anniversary Issue
Both issues of *The Picking Table* in 1989 will celebrate the 30th year of the F.O.M.S. The Fall issue may feature some color on the cover if all goes well.

Helpful Visual-I.D. Hint
Visual differentiation of marsturite from johannsenite may present a problem to collectors when these minerals are found associated with rhodonite. The fibrosity of johannsenite when it occurs with altering rhodonite is the primary discriminate factor. However, marsturite-rhodonite intergrowths, almost always have a common lustrous surface shared by both species. Also, the marsturite-rhodonite intergrowths are usually associated with ganophyllite and light-greenish, prismatic willemite. These associated minerals are rarely, if ever, present on specimens where rhodonite is altering to johannsenite.

Letter to the Editor
The article entitled "Disposal of the Stanton Collection", which appeared in the last issue, elicited comments from several sources. Most expressed delight in this historical tidbit. A letter received from one member, however, expresses satisfaction for an entirely different reason. The letter follows in its entirety:

August 29, 1988

Letter to the editor:

I found the correspondence between Mr. Jenkins and Professor Palache concerning the Stanton collection to be very interesting, more so for the context than the content.

The correspondence demonstrated several advantages held by Dr. Palache. First, he could get a letter to or from Franklin by U.S. mail in 2 days. More important, though, is the courteous timeliness of such correspondence, and the prompt attention to it; this matter generated four exchanges (eight letters) in 24 days. Dr. Palache was indeed fortunate in that respect.

Sincerely,
/signed/
Pete J. Dunn

Farewell to the Lime Crest Open House
Ed Wilk, FOMS Field Trip Committee Chairman, received a letter from the Vice President and Director of Operations for Limestone Products Corporation. The complete text of that letter follows:

September 23, 1988

Dear Mr. Wilk:

The Franklin-Ogdensburg Mineralogical Society has sponsored Open Houses at Limestone Products for many years. Unfortunately, this can no longer continue.

Your group has always conducted its programs in a very complimentary way, so please don't think that this reflects badly on the Society. We have simply determined that the potential liabilities associated with allowing the public into our facilities have become too great.

I would suggest you contact people who might have attended the October Open House and tell them it will not be held.

I am sure you can appreciate our situation. The decision was difficult because we have had a

good relationship with the Society over the years.

Thank you for your understanding. Best wishes for a prosperous year in your Society.

Sincerely,
LIMESTONE PRODUCTS CORPORATION

/signed/ Gordon A. Brandon, Jr.

Spotlight on F.O.M.S. Members
John C. Ebner, Manasquan, NJ took first place in the photomicrography slide contest at the Tucson Show in February, 1988. Marcelle Weber, Guilford, CT has succeeded Peter Modreski, Littleton, CO (both are F.O.M.S. members) as the President of Friends of Mineralogy. Steven C. Misiur, Linden, NJ, both an F.O.M.S. trustee and our Assistant Treasurer, has been re-elected President of the New Jersey Earth Science Association. Congratulations to all!

In Memoria Notes
Elsewhere in this issue are tributes to Sunny Cook and to Henry Althoen. Some of the membership may not be aware of the service to F.O.M.S. by these fine individuals. The following outline of their contributions in time and effort to the Society was gleaned from old issues of the *Picking Table*. This outline may be incomplete because the *PT* did not provide such information in its earliest issues.

Sunny Cook served F.O.M.S. as a Trustee in 1962. She was Co-chairman (with Perry Armagnac) of the Historical Committee from 1963 through 1965.

Henry Althoen served F.O.M.S. in many capacities. He was Secretary, 1963-66; Field Trip Chairman, 1964-65; Vice President, 1970-71; President, 1972-73; Trustee, 1974; Chairman, Historical Committee, 1970-71; Chairman, Membership Committee, 1974; Publicity Chairman, 1970-71; and Chairman, Mineral Sales, 1970-71.

Sclarite
A mineral new to science, "sclarite", was announced last fall. Sclarite is a zinc carbonate hydroxide related to loseyite. This new Franklin mineral species has been found on a single specimen and has been named in honor of Dr. Charles B. Sclar, Department of Geological Sciences, Lehigh University, Bethlehem, PA. The mineral description has not appeared in the literature as yet. A future issue of *The Picking Table* will provide more detail.

Reference for Palmer Shaft Headframe Tracing
Back in May, 1987, I received the tracing shown on page 11 of this issue. The tracing is the work of Steven C. Misiur. The drawing appeared on page 747 in the middle of an article written by C.M. Haight and B.F. Tillson. The article was entitled "Zinc Mining at Franklin, N.J.", and appeared in *Am. Inst. Min. Eng. Trans.*, (1917) **57**, pp720-825.

Some Sad Announcements
The following is a list of deaths of FOMS members and/or noteworthy persons in the mineral collector community.
Florence Hansen in January, 1988. She was an FOMS member and served in the past as manager of the Franklin Mineral Museum and as director of the NJ Zinc Co. Clubhouse. She was age 95.
Jenny Areson, widow of Lee Areson, passed away this past fall. She was an FOMS member of long standing and served as Chairperson of the Welcoming Committee from 1970 through 1974.
Curt Segeler, chemical engineer and amateur mineralogist, friend to mineral collectors around the world, passed away on Sunday, Jan. 22, 1989, eight days following his 88th birthday.

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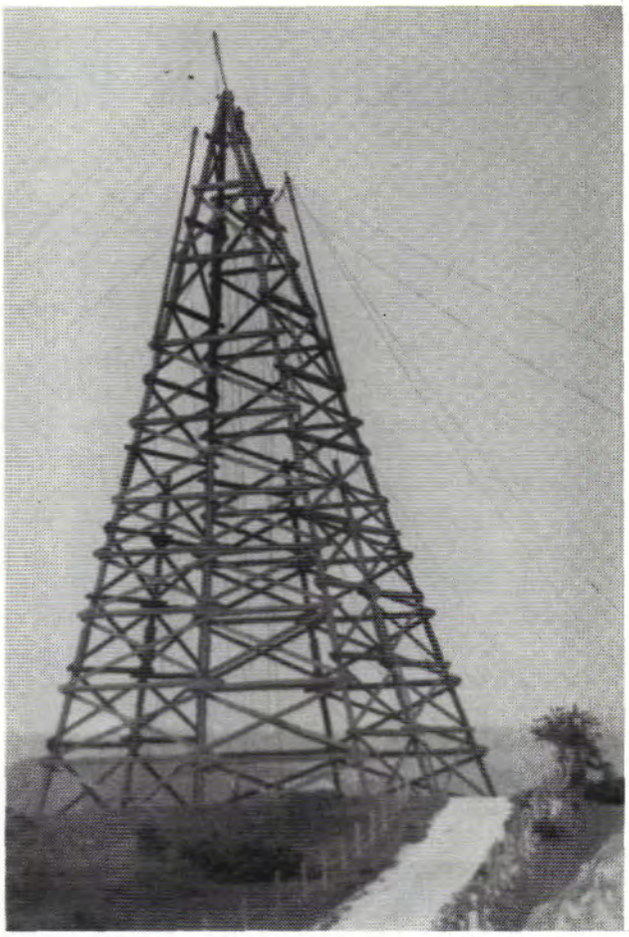
HISTORIC SCENES

(Above) The Parker Shaft head frame, Franklin, NJ (1908). Ralph W. Waters photograph.



On the left are two more classic photographs by Ralph W. Waters. *(Top Left)* Locomotive leaving the Franklin Mine, Franklin, NJ (1933). *(Bottom Left)* Palmer-Franklin hoist, crusher, and tower dryer, Franklin, NJ (undated). *(Above)* The Taylor Mine aerial cable system for hoisting and carrying buckets of waste rock to a dump, Franklin, NJ (1906). The tower stood over 100' high. (Photographer unrecorded). The photographs on this and the preceding page are from the archives of the Franklin Mineral Museum.

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A FRANKLIN FAKE

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

A specimen in the Canfield Collection, held since 1927 by the Smithsonian Institution (U.S. National Museum) consisted of colorless, hexagonal, prismatic crystals on an apparent black matrix, and was labelled "Willemite - Franklin, N.J." Willemite, with identity based on green fluorescence, appeared to be present in small isolated patches, but the prismatic crystals fluoresced in longwave with a light yellow color, and in shortwave with a pinkish orange color. Also present was a brown-coated, light yellow, tabular mineral.

Detailed investigation showed the nearly black coating of the matrix to be goethite (uncommon as such locally) and further studies showed the prismatic crystals to be pyromorphite (also uncommon locally). The brown-coated crystals were found to be drugmanite, a lead ferric-iron phosphate mineral. Because secondary phosphates are unknown from Franklin, the "willemite" was investigated carefully. It was found to be mixed with glue and underlie shards of pyromorphite; the few visible, brightly-fluorescing patches were in spots where previously-attached pyromorphite shards had come off.

This specimen is a sophisticated fake; aside from the willemite mixed with glue under a few shards of pyromorphite, and the misattributed locality, it is a fully legitimate specimen, fine and rich in crystals, and would not arouse the suspicions of many collectors.

It is ironic and tragic in a few ways. Drugmanite is abundant on this specimen, but because the locality was faked, presumably to facilitate its sale to a New Jersey collector, and because we cannot match it with known pyromorphite specimens, this is now a legitimate specimen of drugmanite, from an unknown locality. Because it was faked prior to 1927, this means that drugmanite possibly could have been described much earlier than 1979, when it was found in Belgium. For additional information on Franklin fakes, see the *Mineralogical Record*, **12**, 194 and 197 (1981).

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Editor's Note: *Within a month of receiving the foregoing article, a communication was received from Dr. Pete J. Dunn. The text of that August 9, 1988 communication is shown below.*

The magnificent Balls Hill zircon specimen, figured by Palache (1935; Plate 16 following page 98) has been recently examined by me. It is a spectacular specimen; it is also a spectacular fake. The specimen is a composite, containing several kinds of zircon, much granular matrix, and much more glue. So dies a legend. Simultaneously, the art of Franklin fraud is all the better illustrated.

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WULFENITE

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

Wulfenite ($PbMoO_4$) is confirmed from the Mine at Sterling Hill, Ogdensburg, New Jersey. The mineral occurs as small (to 1mm) yellow intergrown plates directly associated with corroded, granular to cleavage, gray galena. Translucent massive green fluorite, which shows a vivid blue fluorescence under longwave ultraviolet radiation, is also present along with shiny franklinite crystals and a pale pink botryoidal carbonate. The entire assemblage is implanted upon a granular red willemite-franklinite ore with no calcite evident.

It was thought initially that the mineral might be wulfenite due to its color and crystal morphology. Positive identification was made by X-ray diffraction. The XRD pattern consisted of sharp peaks which exactly matched JCPDS Standard #8-475, synthetic wulfenite. EDAX analyses were also performed, but they were less definitive due to peak overlap. However, all the data obtained was consistent for wulfenite. Consequently, the mineral wulfenite should be added to the list of confirmed species from the Mine at Sterling Hill.

The initial wulfenite specimen was brought to the attention of the author by Bruce E. Smith of Allentown, Pa. Several additional specimens have reportly turned up subsequently. However, it appears that wulfenite from Franklin-Ogdensburg will be very rare.

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THE SPRING ACTIVITY SCHEDULE -- 1989

The FRANKLIN-OGDENSBURG MINERALOGICAL SOCIETY, Inc.

The regular activities of the Society consist of lecture programs, field trips, and micro-mineralogy study groups. The regular meetings of the Society are held on the third Saturday of March, April, May, June, September, October, and November. Unless otherwise specified, lecture programs will be followed by business meetings. The seasonal schedule below shows **time** and **place** in **bold face** for all activities.

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MARCH 18, 1989 (Saturday)

NOTICE:	**Today's activities are at Hardyston Township School, Route 23, Franklin, NJ. No Field Trip or Micro-Group in March. Franklin Mineral Museum opens in April.**	
Program #1:	**10:30 a.m.-12 noon**	**"Synthesis observations - Mineral Research at Franklin and Sterling Hill"** by Dr. Pete J. Dunn, Dept. of Mineral Sciences, Smithsonian Institution, Washington, D.C.
	1:00-1:20 p.m.	Business Meeting
Program #2:	**1:30-3:30 p.m.**	**Mineral Exchange Program — SWAP & SELL.** Public invited.

APRIL 15, 1989 (Saturday)

NOTICE:	**All business meetings, lectures, and Micro-Group meetings will be held in Kraissl Hall, Franklin Mineral Museum for the balance of the year.**	
Field Trip:	**9 a.m.-noon**	**Old Andover Iron Mine,** Limecrest Road, Andover, NJ
Micro-Group:	**10 a.m.-noon**	**Kraissl Hall,** Franklin Mineral Museum, Franklin, NJ
Program:	**1:30 p.m.**	**"Formation of Sterling Hill on the Floor of a Proterozoic Sea"** by Dr. Craig A. Johnson, Dept.of Mineral Sciences, American Museum of Natural History, New York City.

MAY 20, 1989 (Saturday)

Field Trip:	**10 a.m.-noon**	**Buckwheat Dump,** Evans Street, Franklin, NJ.
Micro-Group:	**10 a.m.-noon.**	**Kraissl Hall,** Franklin Mineral Museum, Franklin, NJ.
Program:	**1:30 p.m.**	**"Historical Notes on Franklin-Sterling Hill"** by J.L. Baum, Curator, Franklin Mineral Museum.

JUNE 17, 1989 (Saturday)

Field Trip:	**9 a.m.-noon**	Check with Franklin Mineral Museum for field trip location.
Micro-Group:	**10 a.m.-noon**	**Kraissl Hall,** Franklin Mineral Museum, Franklin, NJ.
Program:	**1:30 p.m.**	**"Franklin from the air"** by Bernard T. Kozykowski, Past President, F.O.M.S.

The FRANKLIN-OGDENSBURG MINERALOGICAL SOCIETY, Inc.

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TITLE		PRICE
PALACHE, Charles: The Minerals of Franklin and Sterling Hill, Sussex County, New Jersey. *U.S. Geological Survey Professional Paper No. 180.* Soft back edition, FOMS reprint 1974		$10.00
FRONDEL, Clifford and BAUM, John L.: Structure and Mineralogy of the Franklin Zinc-Iron-Manganese Deposit, New Jersey. *Economic Geology.* Only photocopies are available		$ 2.50
The Picking Table		
Vol. 1, #1 through Vol. 23, #2	each issue	$ 2.50
Vol. 24, #1 through Vol. 29, #2	each issue	$ 3.50
Complete Set (Vol. 1, #1 through Vol. 29, #2)		$80.00

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* *

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MINERALOGICAL SOCIETY, INC.
BOX 146 — FRANKLIN, NEW JERSEY 07416