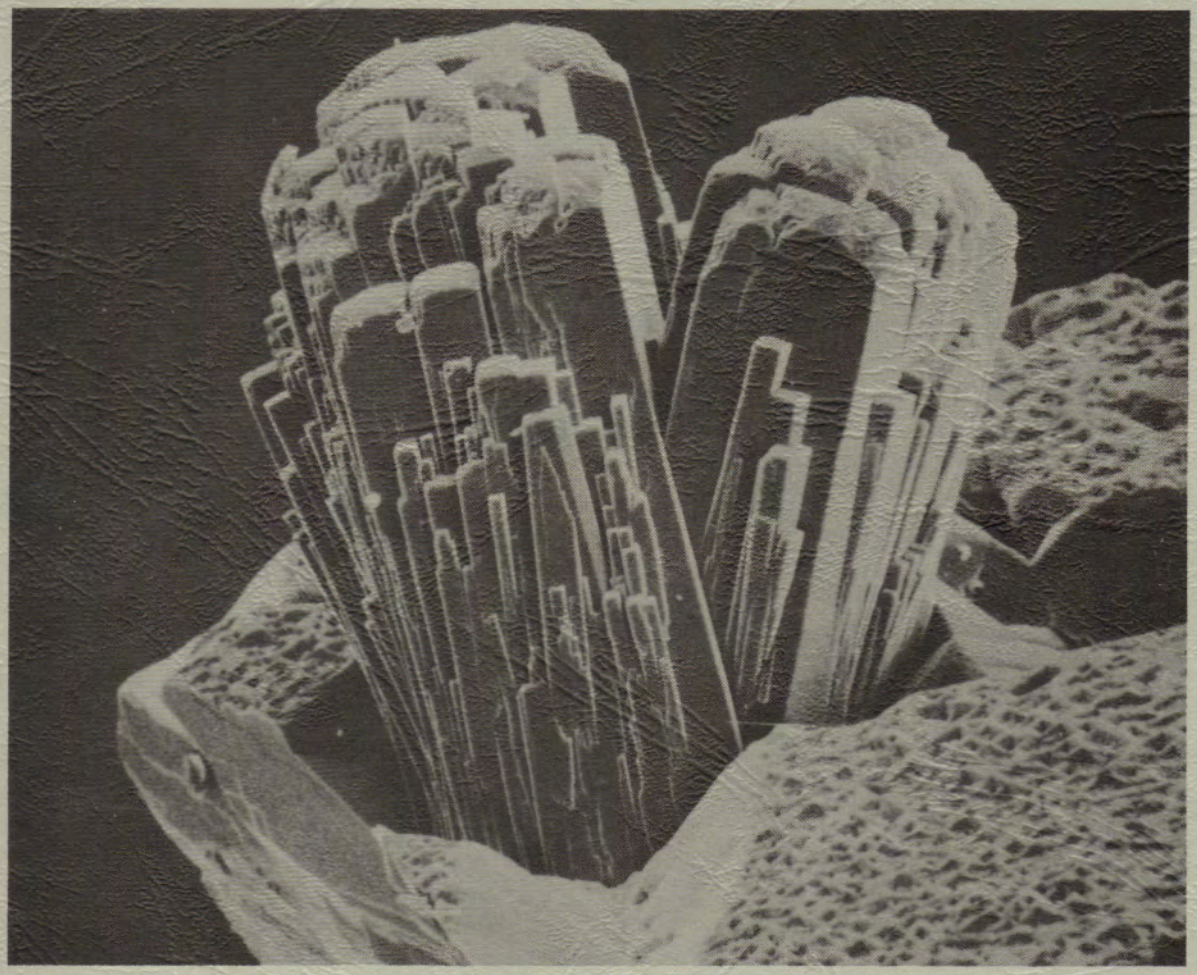
THE PICKING TABLE



JOURNAL of the FRANKLIN-OGDENSBURG MINERALOGICAL SOCIETY, Inc.

FALL, 1991 VOLUME 32, No. 2 Price $5.00

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FRONDEL, Clifford and BAUM, John L. (1974) Structure and Mineralogy of the Franklin Zinc-Iron-Manganese Deposit, New Jersey. *Economic Geology,* **69**, No. 2, p. 157-180. Photocopies only. Add $1.25 if ordered by mail.	$2.50
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THE PICKING TABLE

Journal of the Franklin-Ogdensburg Mineralogical Society, Inc.
Volume 32, Number 2

TABLE OF CONTENTS

* *

ABOUT THE S.E.M. PHOTOGRAPH ON THE FRONT COVER

SEM photo showing divergent aggregrates of kentrolite crystals creating a lovely chevron with distinct crystal faces and rounded terminal pyramids emerging from the depths of a cavity in one face of a cahnite crystal. Field of view is 0.3mm x 0.2mm. This photograph is one of five accompanying the feature article written by John Cianciulli. See the article, which begins on page 15, for photo credits and more about this particular kentrolite assemblage and others found by Herb Yeates.

* *

From the Editor's Desk

Omer S. Dean
10 Bumble Bee Lane
Norwalk, CT 06851-1404

A Study of Top-Slicing at the Franklin Mine
This article is unusual for use in a collector-oriented publication for two reasons. First, it was written specifically for New Jersey Zinc Company management and, therefore, is not collector-oriented. The second reason is its length; in its original form it included a full-page frontispiece, table of contents, and a list of illustrations (28 figures and 12 tables) with the total manuscript totalling about 60 typewritten pages. All of the text will appear in *The Picking Table* in two installments. Only a selected few of the figures and tables will be provided but little or nothing will be lost to the reader because the author provides key information from them within the text.

You may ask, "Why is this article in *The Picking Table* then?" To put it simply, it is an eye-opener; it provides insights into mining practice for which the average collector has no source—you can't find it on the dumps. Instead of concern with finding and breaking into crystal pockets, we see the real routine of the miner and how it varies with the nature of his work place. There is in addition an exposure to mining company values (necessary for a company to remain competitive), which may come as a surprise to some but certainly not to the average business man.

The frontispiece for the article appeared on the the front cover of the last issue of *The Picking Table* before it was decided to use the article itself; a reduced version of the frontispiece is shown again at the beginning of Part One on page 17. The reader may choose to put off reading this two part article until he has the next issue of *The Picking Table* in hand. Reading the article in one sitting will increase its impact.

The author, William D. Lord, Jr., E.M., of the New Jersey Zinc Company, is no longer on the Franklin scene and his whereabouts are unknown. In any case, the Franklin-Ogdensburg Mineralogical Society expresses its gratitude to Mr. Lord for having written the article. It provides many of us with empathy for Franklin miners which would have been impossible otherwise.

Mineral Notes Section
The Mineral Notes section, with its abstracts of selected literature, does not appear in *The Picking Table* in this issue. Look for it again in Volume 33, #1.

Hauck in the Headlines
It has been announced that Dick Hauck, Sterling Hill Mining Company, will be the main speaker at the Eastern Federation of Mineralogical and Lapidary Societies, Inc. Wildacres Workshop held September 9-15, 1991. His topics will include: "Commercialization of Mineralogy (and how that has helped the hobby)", "My experiences as a mineral collector", "How a mine was saved", and "Franklin (NJ) minerals simplified".

For those of you who may not have heard, the Haucks' efforts to obtain official New Jersey Historical Landmark status have succeeded. Congratulations! Efforts to gain National Historical Landmark status for the site continue.

Special Notice
Manuscripts for review and possible use in the next issue of *The Picking Table* should be mailed to the Editor, at the above address, as soon as possible and no later than December 1, 1991. The deadline is, therefore, two weeks earlier than normal. Officers and chairmen should provide their comments or schedules for publication no later than January 10, 1992, and should mail these to the Editor at the following address: 12962 S.W. 88th Lane, Miami, FL 33186. If in doubt as to what to do, please contact Phil Betancourt, FOMS President, who will be kept informed of my travelings and of my Miami phone number when it is available. *The Picking Table*, Spring Issue, will be mailed to the printer at the end of January as it has been in the past. ❐

NOTICE

Do you know of any structures, private or public, constructed primarily or entirely of Franklin rock or minerals? Such structures are part of the "Franklin culture" and their description and location should be preserved. Please provide all details to:
Dr. Pete J. Dunn
Department of Mineral Sciences,
Smithsonian Institution, Washington, DC 20560
See the article entitled "Zinc Memorial Tablets", on page 13, for a prime example of such a structure.

Notes from the Laboratory & changes to the list of species from Franklin and Sterling Hill

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

John L. Baum
Franklin Mineral Museum
Evans Street
Franklin, NJ 07416

Additions to the List

Cianciulliite: This new species from Franklin, a manganese magnesiumzinc hydroxide hydrate, occurs in small dark brown crystals associated with cahnite, willemite, and zincite, on one small micromount-sized specimen. It has been named in honor of John Cianciulli in recognition of his contributions to the three local mineral institutions: the Franklin Mineral Museum, The Franklin-Ogdensburg Mineralogical Society, and the Franklin-Sterling Mineral Exhibit held the first week in October The chemical formula is

$$Mn\ (Mg,Mn)_2Zn_2(OH)_{10}\cdot 2\text{-}4H_2O.$$

Details will be provided in *The Picking Table* subsequent to its formal description.

Stibnite: The material reported as possible stibnite by Palache [*American Mineralogist*, **26**, page 715 (1941)] was subsequently shown to be either zinkenite or berthierite in the late 1970s by PJD. In the autumn of 1990, stibnite was confirmed by PJD as a rare mineral associated with the find of abundant zinkenite on the 800 level and the 900 level at Sterling Hill. This is the first find of legitimate stibnite at Sterling Hill; it is not known from Franklin.

Znucalite: A greenish yellow crust found by Richard Bostwick in the 1970s remained an unknown and unworkable mineral until recently. With the discovery and characterization of the new mineral, znucalite, in Príbram, Czechoslovakia [*Neues Jahrbuch für Mineralogie Monatshefte* (1990), 393-400] the mutual identity of these minerals became apparent. The Sterling Hill occurrence, from the north orebody, is the second occurrence of znucalite. The chemical formula is $Zn_{12}(UO_2)Ca(CO_3)_3(OH)_{22}\cdot 4H_2O$.

(Editor's Note: See znucalite article beginning on page 4]

Changes to the unique list

Cianciulliite is added to the unique list as a new species from Franklin.

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- SPECIAL NOTICE -

Pete J. Dunn of the Smithsonian Institution is particularly interested in examining old maps, sketches, or photographs of the Franklin-Sterling mining operations. If you have such documents, he would appreciate seeing them. If you can help, please write to him at Department of Mineral Sciences, Smithsonian Institution, Washington, DC 20560, or call 202-357-2720 between 5 a.m. and 2 p.m. Monday through Friday.

A Second Locality for Znucalite: The Sterling Mine, Ogdensburg, N.J.

Richard C. Bostwick
43 Montgomery Street
Bloomfield, NJ 07003

Introduction

Znucalite, a rare zinc-uranium-calcium carbonate-hydroxide-hydrate, was first described in September, 1990 from the Lill Mine, Příbram, Czechoslovakia. It is now known from the Sterling Mine in Ogdensburg, New Jersey. Confirmation of Sterling Hill znucalite on the basis of energy-dispersive X-ray analysis and X-ray powder diffraction data has been provided by Dr. Pete J. Dunn.

The article, "Znucalite, $Zn_{12}(UO_2)Ca(CO_3)_3(OH)_{22}\cdot 4H_20$, a new mineral from Příbram, Czechoslovakia", by P. Ondruš, F. Veselovský, and R. Rybka, appeared in *Neues Jahrbuch für Mineralogie Monatshefte* (1990), **9**, pp. 393-400. The information given here about that find is from that article, unless indicated otherwise.

Czechoslovakian Material

Znucalite from the Lill Mine in Příbram was found mostly as white to pale yellow porous coatings, but it also occurs as pale yellow coarsely crystallized aggregrates, and rarely as very small (averaging 15 microns across) thin tabular crystals. Lill Mine znucalite is reported by Ondruš *et al* to fluoresce intense yellow-green under both short wave and long wave ultraviolet radiation. Znucalite is unique chemically in that it is the first zinc-uranium-calcium mineral to be described; its X-ray powder diffraction pattern is also unique. It is named for its composition (Zn-U-Ca).

The Lill Mine exploited complex sulfide veins containing ores of silver, lead, and zinc, with a late-stage overprint of cobalt, nickel, and uranium minerals. The dump where znucalite was found dates from the latter half of the nineteenth century. There znucalite is a recently formed, secondary mineral occurring on weathered rock in the vicinity of corroded sphalerite. It is associated chiefly with gypsum, but also with hydrozincite, aragonite, an unidentified zinc sulfate-carbonate-hydroxide mineral, galena, pyrite, calcite, siderite, römerite, and serpierite.

Lill Mine znucalite is quite rare, and the dump where it was found has been bulldozed and reprocessed for its zinc content (personal communication, Josef Vajdak, April 1991).

Sterling Hill Material

Sterling Hill znucalite first appeared in the scientific literature as an unnamed mineral in 1986, in the March-April *Mineralogical Record*, **17**, pp. 126-127, as one of six species described by Pete J. Dunn in his article, "A new zinc magnesium carbonate and data for other unnamed species from Franklin and Sterling Hill, New Jersey." Here is the znucalite entry in its entirety:

> 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.)

Three years earlier there had been a brief, casual reference to green-fluorescing yellow crusts from the North Ore Body* at Sterling Hill on pages 47-48 of Manuel Robbin's *The Collector's Book of Fluorescent Minerals* (Van Nostrand Reinhold Co. Inc., 1983) in a section written by me and titled "In the Sterling Mine." Here the material was referred to as an "impure, highly hydrated dolomite" with "bright uranium green" fluorescence. This reflects Fred Parker's identification of a specimen sent to him by this author shortly after it was found. Partial X-ray diffraction data and semi-quantitative X-ray fluorescence data indicated an uranium-bearing dolomite-like mineral, but due to the impure, complex nature of the material, no more could be determined with certainty (personal communications, Fred Parker, 1976 and 1991).

Sterling Hill znucalite was found in 1976 on the 2350 level of the North Ore Body of the Sterling Mine. There the safety exit was a raise in Franklin marble, at least four meters distant from the footwall of the northern leg of the ore, and in the west rib of the footwall drift. Above 2350 level the safety exit continued in the same relation to the ore through the 2250, 2150, 2050, and 1950 levels, emerging on the 1850 level near the Lamont-Doherty seismograph station. This safety exit evidently acted as a conduit for water from the northern end of the mine, as there was a constant flow of water there, bringing with it displaced algae, earthworms, etc. Where this water flowed over the faces of the drifts adjacent to the safety exit, a thin coating of flowstone was common. On 2350 level, on the west rib of the drift immediately south of the safety exit, at approximate mine coordinates 2950N, 00E, there was a pale yellow patch of flowstone more than a meter across. Here the flowstone, which normally fluoresced white to cream under both short wave and long wave ultraviolet radiation, fluoresced instead a distinct green; it was this fluorescence which prompted collecting in that area. Where cracks were present, slabs of the green-fluorescing crust were removed with a scaling bar. Inside the cracks the color of the material in reflected light

* The North Ore Body was not a separate body of ore at Sterling Hill, but the northern extension of the east limb of the orebody below the 1850 level. It was mined through a two-compartment shaft (technically a winze in that it did not extend to the surface) located approximately 1100 feet northeast of the main shaft. The North Ore Body shaft extended from the 1750 level to approximately 150 feet below the 2550 level; its hoist was located on the 1850 level. The North Ore Body (often abbreviated N.O.B.) was an administrative rather than a geological entity and this spelling, as distinguished from the two word form, with orebody as two words rather than the more conventional "orebody" reflected New Jersey Zinc Company usage.

Figure 1 (upper left). Scanning electron micrograph of znucalite, Lill Mine, Příbram, Czechoslovakia. (ESM BS-340, Telsa, photomicrograph by A. Gabašová, Geological Survey, Praha.

was often vivid greenish yellow, which faded soon after the specimens were removed from the mine. Perhaps fifty pounds of znucalite-bearing material were taken; at the time it caused little interest in the collector community. In 1978 the North Ore Body was shut down, and began to fill with water; by the time of the closing of the Sterling Mine in 1986, the 2350 level was well under water. At present the water has risen over the 700 level there.

Most examples of Sterling Mine znucalite are from the surface of the drift described above. There the mineral formed opaque, lusterless, pale yellow crusts generally less than 1mm thick; rarely this crust was thicker and developed in rib-like structures as much as 10mm across and 5mm thick. Where znucalite had developed in cracks away from the face of the drift, it formed greenish yellow crusts, again less than 1mm thick, but with a botryoidal fibrous structure readily apparent under low magnification, and much like that of wavellite or pectolite.

Sterling Mine znucalite fluoresces green of moderate to weak intensity under short wave and long wave ultraviolet radiation; no phosphorescence was observed. The fluorescence is much weaker than that of typical Franklin-Sterling Hill willemite, and less yellowish than the aforementioned fluorescence of willemite or that of most secondary uranium minerals, e.g. autunite. In a direct comparison of Sterling Hill znucalite with Czechoslovakian material, Earl Verbeek observed that the fluorescent hue of both is almost identical; that their fluorescent intensities under long wave ultraviolet radiation are the same, but that under short wave ultraviolet radiation the Czechoslovakian znucalite is slightly brighter; and that both Sterling Hill and Czechoslovakian znucalite fluoresce somewhat more brightly under short wave ultraviolet radiation than under long wave ultraviolet radiation (personal communication, Earl Verbeek, 1991).

The matrix of Sterling Mine znucalite is compact white calcite with cleavages from 1mm to 3mm in breadth, which in mass presents a mottled pale to dark gray appearance due to abundant graphite distributed in flakes and in a network of thin seams. One millimeter flakes of a colorless mica are present in some specimens.

The znucalite crusts, particularly those from the drift face, are accompanied by other minerals, notably hydrozincite and gypsum (much like the Příbram material).. Hydrozincite is easily identified by its white powdery appearance and intense blue fluorescence under short wave ultraviolet radiation. The gypsum is less common and does not fluoresce, but can be

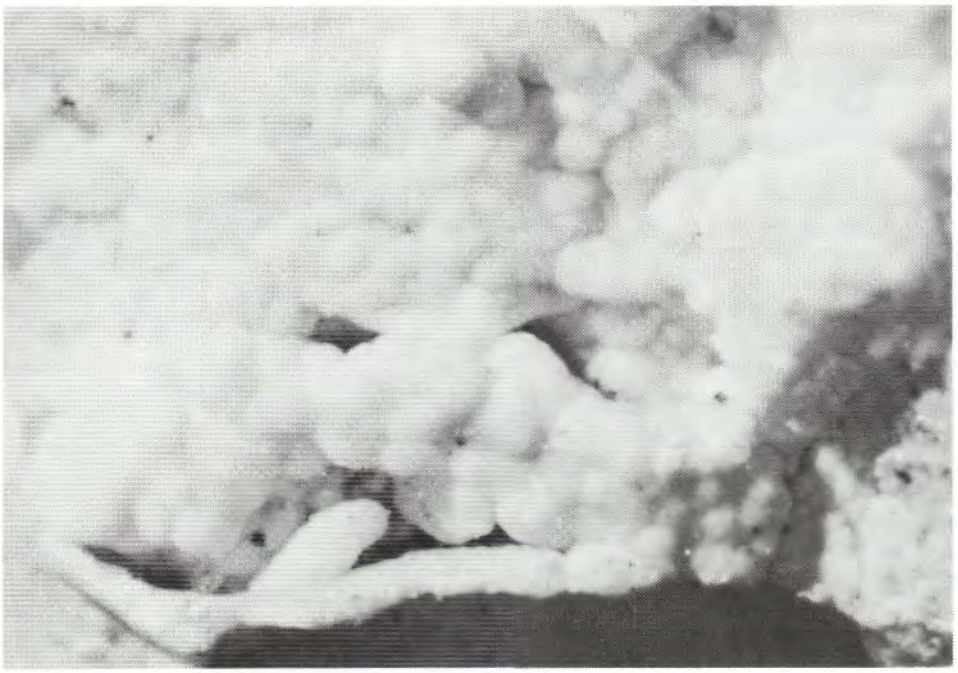

Figure 2 (lower left). Znucalite, Sterling Mine, Ogdensburg, N.J., showing botryoidal and rib-like structure. Horizontal field of view is 2.88mm. Omer Dean specimen and photomicrograph, catalogue #764.

identified by its characteristic crystal form. Fluorescent coatings of two other undetermined minerals are apparent under both short wave and long wave ultraviolet radiation; one fluoresces pale yellow-orange of moderate intensity, while the other fluoresces and phosphoresces weak pale cream.

At the time of the find in 1976, the author suspected the presence of uranium. The uranyl ion, readily transported in low-temperature aqueous solutions, is frequently the cause of fluorescence in minerals deposited through the action of groundwater, notably various fine-grained forms of quartz (agate, jasper, onyx, etc.) and also opal, calcite, aragonite, and gypsum. The distance of the green-fluorescing crusts from the ore and their obvious post-mining origin argued against the presence of primary willemite, the only abundant green-fluorescing mineral in the Franklin-Sterling Hill area. Stephen Sanford provided the first tentative identification of uranium through gamma-ray spectrometry, confirming that the crusts had a gamma-ray emission pattern similar to that of naturally occurring uranium ore. Dr. Warren Miller shortly thereafter confirmed the presence of uranium in amounts greater than 1% by semi-quantitative optical emission spectroscopy; Fred Parker's contribution has already been noted. Specimens were than sent to the National Museum of Natural History, with results cited earlier in this article.

Znucalite is present in many Franklin-Sterling Hill collections, either mislabeled or identified as an unknown. Prior to 1990, at least 20 specimens were dispersed by me, specifically labeled as an unknown mineral; additional material may have been removed from the mine and distributed by others. One specimen of those brought out by me has been seen identified as metalodevite, a mineral whose habit, associations, and location in the Sterling Mine do not resemble those of znucalite. For the record, metalodevite was found in small (less than 1mm) yellow tabular crystals associated with ogdensburgite and köttigite on a matrix of lean "black ore" (grains of franklinite and gray willemite in pinkish calcite) from 960 stope, fifty feet above 340 level.

In closing, it should be noted that not all pale yellow, green-fluorescing crusts from Sterling Hill are znucalite. Monohydrocalcite and uranospinite both bear a strong superficial resemblance to znucalite, and there are other undescribed materials in circulation which might be confused with any of them. Distinguishing between these is not within the scope of this article. Collectors should be cautioned that the accurate identification of such crusts, films, coatings, and the like is often difficult for mineralogists, and practically impossible for amateurs. The conditions of deposition of efflorescent minerals lead to the development of crusts which may have many different mineral phases present, often in complex mixtures. The temptation to label such crusts as rare, valuable minerals without rigorous confirmation is very strong, but should be avoided. ❐

* *

President's Message

Philip P. Betancourt
410 Chester Avenue
Moorestown, NJ 08057

Several activities are planned for the fall, beginning with a new type of collecting trip. The September field trip will be to the new dumps being established at the Sterling Mine where tons of material are being brought up from underground. No charge is made for admission, but $1.00 per pound needs to be paid for anything collected, to help pay for the cost of bringing up the material. This is a new opportunity to collect Sterling Mine specimens, and we will hope for something really fine.

The banquet in October, on Saturday, October 5, will begin at 6:30 p.m. this year. As last year, it will be buffet style, with several dishes including both beef and chicken. The cost is $16.00 per ticket. An auction will follow the banquet.

At the last meeting of the year, the executive board of the FOMS discussed raising dues to meet rising costs but decided to postpone this action for the moment. Dues are not sufficient to support the *Picking Table* and other normal club activities, and special money-raising activities are necessary to help the treasury. The auction at the annual dinner is an important one of these money-makers. Hopefully, some donations of quality Franklin and Sterling Hill mineral specimens can be made this year, making the auction an important way to acquire good specimens (while helping the treasury at the same time). Could a few people please dig down into their duplicate boxes? See you in the fall. ❐

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The Franklin Mineral Museum and the Start of a New Era

John Cianciulli
60 Alpine Road
Sussex, NJ 07461

The Franklin Mineral Museum was started as the replica of an old zinc mine, in what was the Taylor engine house which originally supplied the power to hoist the mined ore from the Buckwheat Open Pit. The venture was an immediate success. Thereafter a small mineral collection was added to the exhibit. This first collection was provided by the Zinc Company, formerly on exhibit at the Neighborhood House in Franklin. Local enthusiasm for the new museum fueled the benevolence of the people of Franklin. Their donations of minerals and artifacts spawned the need for a larger building to house the museum.

The Franklin Kiwanis Club raised the funds necessary to build a repository adjacent to the previously established mine replica. On October 9, 1965 the new museum opened its doors to the public. Mr. Edward G. Selems, the first President of the Franklin Mineral Museum, was a major contributor and driving force in establishing the new museum. Donated, purchased, and loaned specimens filled the exhibit hall and fluorescent display. Such benevolence was memorialized by the Kiwanis by displaying small collections or specimens by donor rather than systematically. This method of display certainly encouraged others to contribute to the museum collections over the years. As time passed, the museum played host to increasing numbers of students of all ages. Schools started to work museum visits into their science curriculum. As the Franklin Mineral Museum's reputation as an educational institution grew, it became increasingly important to improve the museum exhibits and lecture tours. One of the first people to recognize and address this need was John L. Baum, Curator and team leader of the museum staff. Having served the museum and the community for many years, Mr. Baum continues in his efforts to improve the Franklin Mineral Museum and its offerings to students, the general public, and the scientific community.

Fred and Alice Kraissl were early supporters of the Franklin Mineral Museum. Their contributions came in several guises (minerals, manpower, and money). They also had the foresight to see the opportunities the museum could offer the thousands of people who would come to see it each year. One of their many contributions was the financing and building of an exhibit-lecture hall appropriately named Kraissl Hall in their honor. Kraissl Hall was opened in 1976 and serves as the meeting place for the museum's Board of Trustees and the Franklin-Ogdensburg Mineralogical Society.

1986 was the beginning of a new era for the museum. Ten years after Kraissl Hall was built, Arthur J. and Harriet M. Mitteldorf, former owners of Spex Industries of Edison, New Jersey, donated the Spex-Gerstmann Franklin mineral collection. This collection is one of the most notable private collections of Franklin-Sterling Hill area minerals ever assembled. Mr. Ewald Gerstmann certainly deserves much credit for acquiring and preserving much of the best material from here ever to see the light of day. Mr. Gerstmann shared his collection with the public and scientific community. It is probably the most studied Franklin-Sterling Hill private collection in existence!

The Spex-Gerstmann collection contained 2,029 mineral specimens most of which are from the Franklin-Sterling Hill area. A small number of these were deaccessioned by the Mittleldorfs before the museum acquired the collection. None the less, the major portion of it is intact and the total number of specimens still

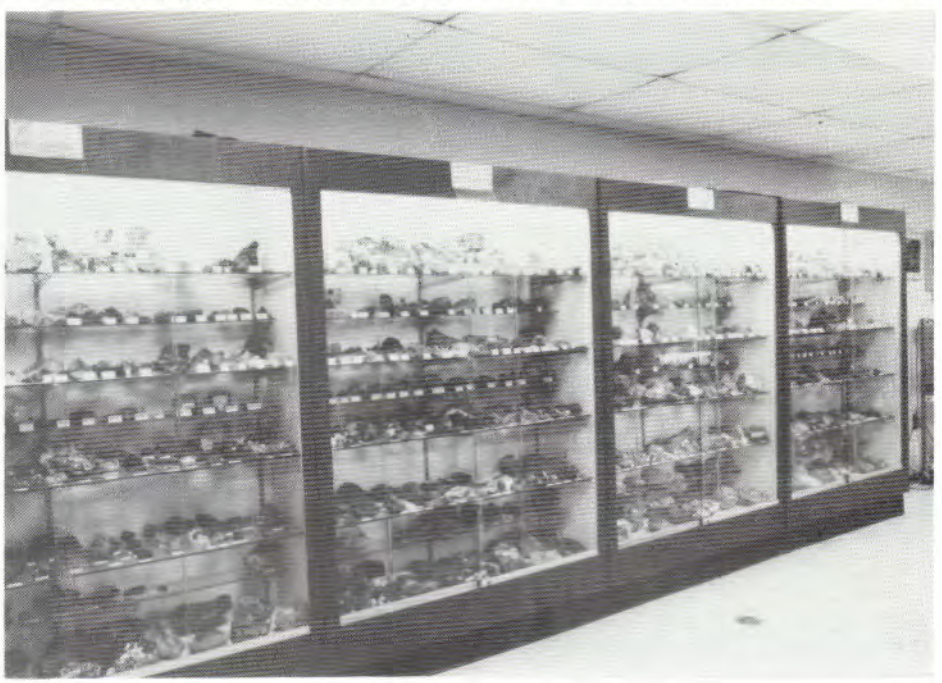

Figure 1. View of some of the Spex-Gerstmann collection located in Kraissl Hall where about 1,700 of the more than 2,000 specimens are on display.

Figure 2. The Wilfred R. Welsh Indian artifacts collection. It contains many curiosities from New Jersey.

exceeds 2,000. The museum also purchased a number of rare species from Mr. Gerstmann which were ultimately integrated into the collection. The fluorescent part of this collection was integrated into the museum's existing fluorescent display and the remainder of the specimens are somewhat systematically displayed in Kraissl Hall in display cases purchased from the late Lee and Jennie Areson estate (see Figure 1).

There are few of the 330+ mineral species found at Franklin and Sterling Hill that are not represented in the Spex-Gerstmann collection. It is difficult to come up with an exact total because more species were being discovered in the collection as it was being put out for display. One such discovery is the mineral antlerite. Antlerite was found in a mixture with gypsum and linarite on rhodonite with hendricksite from the Franklin mine. The mixture, bright green in color in striking contrast to bright pink rhodonite, was previously thought to be malachite (S-G 481). A very fine cuspidine was found (S-G 990). The specimen was labelled as johannsenite crystals. These crystals were found to be glaucochroite in a white matrix which is the cuspidine. Much more work will be done on this collection as time allows. It is now the best reference collection of Franklin area minerals on public display. Most museums exhibit the most aesthetic of their treasures often shutting out the inquisitive collector or student. Where else could someone go to see a real johnbaumite or gerstmannite?

The Spex-Gerstmann collection was just the beginning of good fortune for the museum and the Franklin-Sterling Hill mineral culture. Since, two smaller Franklin-Sterling Hill collections were donated. The Henry Morton Althoen collection which includes along with a number of other fine specimens, a larsenite specimen from the R.B. Gage collection. The Dr. Alfred Standfast collection which turned up a couple of "supersleepers", a spectacular hauckite (confirmed by Dr. Dunn), and hardystonite crystals previously labelled diopside. But for the Franklin Mineral Museum, the "Grand Daddy" of all collections was yet to come!

The late David E. Jensen, former mineralogist for Ward's Natural Science Establishment, remembered the Franklin Mineral Museum in his will. A friend of mineralogy for most of his lifetime, Mr. Jensen showed a particular fondness for the museum and Franklin mineralogy. His generous bequest enabled the museum to follow through on plans for a major addition. Subsequent to the arrival of this bequest, Bill Welsh voiced an interest in donating his world-wide collection to the museum. The museum's Board of Trustees overwhelmingly supported the expansion of the museum and accepted Mr. Welsh's offer of the collection. After rigorous planning, review, and development, the contractor broke ground for the David E. Jensen Annex in November, 1990. By early spring 1991 the almost 1800 square foot addition was completed.

The David E. Jensen Annex is (not visible from Evans Street when

Figure 3 (right). View of some of the Wilfred R. Welsh fossil collection.

Figure 4. View of part of the Wilfred R. Welsh mineral collection located in the main exhibit hall of the David E. Jensen Annex. The carved wood mural over the cabinet is a gift from the MacDonald's Restaurant in Franklin, N.J.

one faces the museum) an expansive complex of four rooms which is accessible via the lobby of the museum. The Annex entrance, double steel and glass doors, is at the opposite end of the lobby from the museum's main entrance. Beyond these doors are two rooms. The room to the immediate right is the "Indian Room" (see Figure 2); the room opposite the double doors is the "Fossil Room" (see Figure 3). To the left, demarcating the Indian and Fossil rooms, is the door entering the "Main Exhibit Hall" which is for the rock and mineral collections. Looking across the Main Exhibit Hall from its entrance, one sees the two doors for the new "Archive Room." The Archive will be the repository for archival literature and artifacts germane to the history of mining, geology, and mineralogy of the area.

The Wilfred R. Welsh collections are an amazing assemblage of mineral specimens, fossils, and artifacts. Bill and Mary Welsh, donors, and John L. Baum, Museum Curator, worked diligently installing the collections in the Annex. Presently on exhibit are 4,000 minerals, 500 rocks, 850 fossils, and 750 artifacts for a total of 6100 specimens. In storage are 700 minerals, 150 rocks, and 100 fossils bringing the grand total of specimens to 7,050. The mineral collection (see Figure 4) is set up systematically (Dana), and sequentially in learning modules such as basic rocks, Mohs hardness scale, crystallography, molecular structure, etc., in keeping with the museum's goal to improve and expand educational exhibits. The fossil collection features many New Jersey specimens including a large dinosaur footprint. The petrified wood is equally impressive! The Indian artifacts collection also features many specimens from New Jersey. In a word, the Welsh collections are "impressive"!

In January, 1991 a small but significant collection of world-wide minerals was donated to the museum by Mr. William Polito, an architect from New York City. Mr. Polito specialized in marble architecture. Hence, he collected a number of polished marble spheres and eggs. His collection of spheres and eggs was featured in an article in the New York Times, September 30, 1973, and again in the December, 1974 isssue of House Beautiful. In addition to the sphere and egg collection, Mr. Polito donated some very fine mineral specimens such as a 4mm diamond in matrix, and a very fine group of calcite crystals from Cumberland, England which were from the Washington A. Roebling collection.

The Franklin-Ogdensburg Mineralogical Society has contributed immeasurably to the growth of the museum. The Society gives logistical support to the museum which was once the duty of the now defunct Franklin Kiwanis. Over the years there have been many dedicated supporters of the Franklin Mineral Museum, Inc. Their unselfish contributions of time, money, and expertise have made the museum what it is today. Thanks to all who continue to support it!

Acknowledgements
The photographs for this article were taken by Mr. Steven B. Sanford. Mr. John L. Baum and Mr. Wilfred R. Welsh gave their assistance by gathering and providing various statistics.

References

Franklin Mineral Museum, Inc. Archives. ❐

Remembrances of Franklin Half a Century Ago

Alfred L. Standfast, M.D.
32 Oak Street,
Binghamton, NY 13905

*[**Editor's Note:** During the course of editorial review several requests for further elaboration on persons, places, or topics were responded to by the author. These elaborations constitute the notes you will find at appropriate places within the text. Although this is a bit unusual it does avoid constant referral to footnotes.]*

The Franklin Mine was still very active during World War II, but there was no store at which to purchase mineral specimens. I visited the New Jersey Zinc Company office on Main Street and begged a specimen from kindly Mr. Bauer. Across the street was the Public Library which attempted to exhibit some very large attractive chunks of ore, but none were for sale.

The Parker Dump was open and it was situated down the street where the Fire House now stands. An opening of the Parker Shaft was covered with a hefty five foot high iron cage and pathways through the adjacent lots revealed sizeable pieces of ore. Part of the railroad track was still in place and fruitful digging for specimens was located in the vicinity of the current Fire House.

Very often a stray rockhound was poking for treasures and frequently an idle miner would appear with a few specimens to sell so he could buy some "near" beer. If you looked rich, he might invite you into his cellar. One miner showed me his collection which occupied half of the first floor of his house. I still remember some of the huge jeffersonite bars (crystals). He proposed to sell the whole collection for $1500.

One portion of the Parker Dump extended down to Route 23 and they were building a garage on top of it. From the Parker Shaft south to Evans Street, Buckwheat Road dumps (mainly calcite) lay next to the fence. Taylor Road, the side road east of Evans Street, also had a dump between the houses. Proceeding towards the Buckwheat Pit was another huge dump with rhodonite and green microcline boulders the size of footballs. The deep pit was dry because the mine was still working at the Palmer Shaft. Mr. Bauer had his residence at the west end of Evans Street and he invited me in to see some of his collection.

Later, in the '50s and '60s, the Buckwheat Dump was very popular and a person could drive his car right in through the woods to the site. Many large boulders were in the woods nestled in the poison ivy; some of these boulders were full of norbergite. Trucks and car trunks carried off tons of fluorescent material. Ed Skidmore had tons of it piled up to the ceiling of his garage. Ed did beautiful lapidary work and manufactured quartz UV lamps. If I remember correctly, he worked with fluorescent materials for the U.S. Navy. A friend of mine, Dr. W. B. Thomas, sometimes got a miner to spall dolomite boulders down to small pieces and then he would carry them off for microscopic study. Ivan Lee did spectroscopic and chemical analysis on questionable pieces.

[Note A. W. B. Thomas, M.D. was a retired psychiatrist who lived in Lavallette, N.J. The "W" may stand for William, I'm not sure; he was always known as "Tommy". He was an ardent micromounter and made thousands of mounts, many of them were Buckwheat dolomite specimens. He wrote one article for The Picking Table (see Vol. 8, No. 1, page 9). I regret that I never made his portrait. I bought some specimens from him, but regrettably I never got around to buy his many "box-fulls". Alice Kraissl was one of his good customers; he also donated many specimens to the Franklin Mineral Museum. Tommy's mineral identifcations were by crystal form, chemical analysis, spectroscopy by Ivan Lee, consultation with experts, etc. In those days X-ray diffraction was available only in the larger institutions. Tommy was a close friend of John Albanese and once rummaged through the discards in Albanese's barn to pick up what appeared to be dirty black rock. Later Tommy found numerous tiny flecks of gold in this Franklin area material.]

The iron quarry opposite Franklin Pond (now called the Rifle Range) had walls covered with attractive amethystine-colored fluorite and was open for collecting. Occasionally a steam locomotive came down the track from Sterling pulling numerous cars of ore.

[Note B. Oscar Krautheim should be remembered as a self-appointed guard at many of our collecting dumps, especially at New Street, Paterson, N.J., where he often controlled unruly and reckless collecting which threatened to close the dumps. When the Nicol Quarry (later Cellate) was open, large boulders of fluorescent diopside with norbergite were spalled. In some nearby gully we ran into arsenic-colored water with its characteristic odor but I have never encountered it again. Down at Sterling Hill in the late '50s, when the FOMS listed 700 or more paid members, it required some policing to restrain the wall climbers and also the teenagers who rolled boulders down into the holes. I remember one spectacular large boulder of pure amorphous fluorescent calcite that we started to spall. I carried some pieces to my car, but when I returned a few minutes later, this enormous boulder was no more. Our field trips back then included Cranberry Lake, N. J., which was very radioactive; fossil trips to the Port Jervis area and to Carbondale, Pa.; trips to the Cornwall Iron Mines (closed soon after the flood) with Frank Z. Edwards; plus trips to Hellertown, Pa., Gilman's cave and mineral store and the nearby zinc mines, and the Andover Iron Mine in N.J. where I ran across Perry Armagnac, Science Editor for Popular Science magazine, whom I hadn't seen since our college days at Columbia University back in the '20s.]

Aside from local miners, there was no source of nice specimens.

Of course there was Ward's Natural Science Establishment in Rochester, New York. It was said they had obtained three freight carloads of freshly mined ore from the Franklin area. Columbia University geology students made frequent trips underground as part of their studies. My friend John Albanese, the dealer, had always hoped to go underground but never succeeded. He found numerous unidentified specimens which went to Harvard and the New York Natural History Museum and hoped some day there would be a mineral named for him.

[Note C. John Albanese worked as an electrician for General Motors, I believe, and in his spare time became a remarkable student of mineralogy and mineral dealer, purchasing many famous collections which contained valuable minerals, books, cabinets, etc. He was a veteran of both World Wars. He bragged about having seen and sold more rare Franklin minerals than the staff of the New Jersey Zinc Company. The American Museum of Natural History in N.Y.C. and the museum at Harvard had first choice with his purchases before he sent out lists. For some unknown reason, his is another of the portraits which I did not take; I did , however, make many slides of his minerals for his lectures. He also spent hours at the typewriter and I finally convinced him to write his "Notes"; after two years, however, he became discouraged because of the poor circulation of "Notes" and quit. I enticed him to come to Binghamton for 2 or 3 lectures. He sold at many shows in the East and was upset about the heat and flies when they pushed dealers out into a tent at the Franklin Armory Show. His old friend, Dr. Thomas, was with him when he died in the hospital.]

Another mineral dealer at that time was Shortmann Brothers in Easthampton, Massachusetts. Also, there was Hugh Ford in downtown Manhattan with really choice material. An older doctor rented an area in the Endicott Hotal on Columbus Avenue near the New York Museum. He had large stocks of Franklin fluorescents, including one huge piece of pure wollastonite from the depths of Franklin. It was about two feet across and fluoresced beautifully. How any miner ever got it out of the mine and to New York I'll never know. If I recall correctly it was sold to an Italian museum for around $1500.

[Note D. This older doctor was a retired Swiss physician who came to work at the American Museum of Natural History in New York City and later opened a shop in the nearby Endicott Hotel. I am sorry I don't recall his name, but I showed him a long wave fluorescent lamp I made, housed in an outdoor mount containing a Sun Lamp and a Corex filter (used for stage show lighting). He soon produced this commercially under the name "Teddar".]

Another of the many outside sources of Franklin material was a probation officer residing near Bernardsville, N.J. Somehow he seemed to obtain a steady supply of dynamite boxes filled with choice Franklin minerals and both Albanese and Dr. Thomas helped him identify them. This probation officer at a later date advertised his material as "rainbow rocks".

On my way to Long Island, I frequently passed through Franklin after dark. I walked with my kids through the streets with a battery-powered UV lamp and we saw the rock and sand piles and even the roads glow willemite-green and calcite-red. It was at this time that I worked in the X-Ray department of a hospital in Binghamton and one day I held a chunk of willemite not far from the fluoroscope and was amazed to see how much "scatter" (stray radiation) illuminated the specimen.

[Note E. As a practicing radiologist, I owned Radium and Radiotherapy X-ray equipment and sometimes viewed fluorescent rocks under X-rays. Early fluoroscopes had special willemite screens (but not phosphorescing willemite) and the intensifying screens for X-ray film were made of calcium tungstate (scheelite).]

It is hoped that these remembrances of war-time Franklin and mineral collecting will provide a "feel" and appreciation for the era. ❐

* *

IN MEMORIAM

Gary Weingarten, resident of Morris Plains, New Jersey.
Sept. 19, 1912 — Jan. 28, 1990

"Seeker & Sharer of Knowledge" is the inscription on his tombstone. This describes Gary the best.

Gary was an active member of the FOMS micromount group as well as the "Peregrines' Nest" micro study group. He was known for his dedication to mineral identification at the New Jersey Earth Science Show as well as the Morris Museum Rock & Mineral Day. In addition to FOMS, Gary was an officer at the Morris Museum Mineralogical Society at Morristown, N.J. and a long time member of the Fluorescent Mineral Society and of Sand Collectors International. He owned the largest Israeli mineral collection in the U.S. and had an extensive collection of the Cranberry Lake radioactive minerals. Gary was instrumental in the discovery of the new mineral "bentorite" named after a geologist at Hebrew University. Gary was Curator at the Earth Science Department of Fairleigh Dickinson University and taught geology to gifted children at St. Elizabeth College at Convent, N.J.

We who knew him miss him very much.

Ralph Thomas ❐

SHORT NOTES

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

We know of an unsuccessful attempt, in approximately 1772, to have the Sterling Hill ore (not then known to contain zinc) smelted in Swansea, Wales. What is not commonly known, however, is that Swansea later was to be an early zinc-smelting center; the operation was started by Hussey Vivian in 1835 and was very successful. Thus, the choice of site was a good one, but the attempt was about 63 years premature.

* * *

One of the oldest buildings in Franklin is the small church on Oak Street. *[Editor's Note: The reader may want to refer to the map of Franklin which appeared in the previous issue, **32**, #1, pp.6.]* It has hosted a greater diversity of religious activity than most sites of worship. It was built of stone in 1832 and referred to often in the early literature for its beauty and grace. It was originally a Baptist Church and remained one until 1853; it then was unused for an indeterminate period. The Presbyterians took it over in 1873, and the Methodists and Presbyterians both utilized it from 1873-1876. It was then used by the Dutch Reformed Church from 1877-1893, and again by the Presbyterians from 1894-1914. After substantial renovations, the building became a Jewish synagogue in 1915 and remains so today. Subsequent renovations have not been architecturally compatible with the pre-existing structure, but the beauty of the early building is visible.

The small area surrounding the synagogue is rich in local history. An overgrown area on the northeast side of Oak Street is a long-abandoned and wholly overgrown cemetery. Michael Rorick, one of Franklin's earliest settlers, and instrumental in building one of the earliest ironworks in Franklin, is buried there. A large vacant lot adjacent to the synagogue was the site of the second of the early Franklin Schools; it was built in 1876. Behind the synagogue in the woods to the south is a huge glacially scoured rock with deep grooves; it served as a child's playground slide in earlier years. A bit further to the south, on the bluff overlooking the pond, is the site of a now-removed water-tower and also "cannon-rock," which once hosted the Borough of Franklin's cannon, used for special celebrations. The whole of the area described here is probably less than an acre.

On Main Street, near its intersection with Evans Street, is the new and large Presbyterian Church. The land was donated by the New Jersey Zinc Company, as was the plaque identifying the Church. Look closely; the plaque, fittingly, is made of zinc. See "Zinc Memorial Tablets" elsewhere in this issue.

* * *

Although we are all aware of the immigrant miners who played such a critical role in local zinc mining, it is useful to recognize that these zinc miners were not the first immigrant miners in northern New Jersey. The iron mines 20-30 miles to the south of the Franklin-Sterling Hill area were well-recognized in the mid-18th century, and it was to that area that immigrant miners first came. The pivotal person was Peter Hasenclaver, a vigorous entrepreneur, and he brought the first miners from Germany. All told, about 535 persons came in approximately 1765; these included miners, forgemen, founders (foundrymen), colliers (charcoal-makers), carpenters, and masons. Their ironworks were considered the best of their time, very well-made, sturdy to the point of redundant strength, and seldom needed repairs. Hasenclaver's operations had a great influence on other ironmasters, and many of the features of their forges and furnaces were copied in later years.

Unfortunately, little is known of the character of Franklin's eighteenth century forge- and furnace-workers; the ironmasters were mostly English, but the nationality of the workers was not recorded. Newspapers of the late 1700s carried numerous advertisements offering rewards for runaway slaves. Some of these had run away from ironworks, but the ironworks in Franklin and Ogdensburg are not specifically mentioned. ❐

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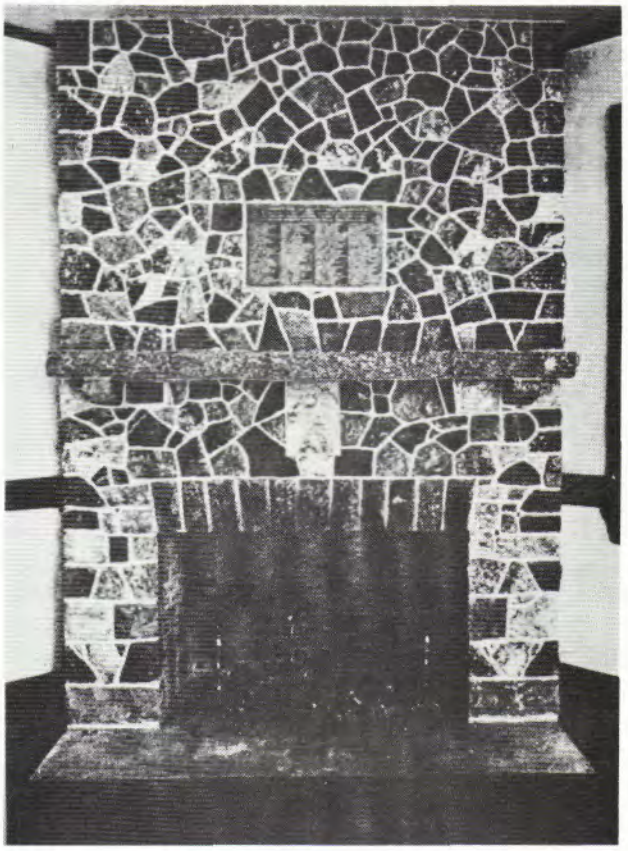
*[**Editor's Note**: The article "Zinc Memorial Tablets" first appeared in Zinc, Volume 11, beginning on page 125 (May, 1926). The first five paragraphs and the first sentence of the sixth paragraph of the original text plus three of the photographs are germane to the interests of our readers and are shown below and on page 14.]*

Zinc Memorial Tablets

by
Anonymous

The durability of zinc makes it appropriate material for the preservation of inscriptions intended to commemorate persons and events. The slate-gray color that this metal acquires with age, in contrast to the greenish black of bronze, lends zinc tablets a distinctive appearance. Zinc produced by The New Jersey Zinc Company has already been used for a number of Memorial Tablets; we reproduce pictures of these in the following pages *(see Figures 2 & 3 on next page)*.

The first two tablets that we show are set in the fireplace of the Sussex County Historical Building. This fireplace *(see Fig. 1)* is built entirely of material obtained from Sussex County itself. The Franklin Mine of The New Jersey Zinc Company not only furnished the zinc for the tablets, but many of the stones in the fireplace as well. These stones are samples of the numerous beautiful minerals found in the Franklin deposits, which have been famous for their wealth in rare minerals for over a century; they were known as a source of rare minerals long before practical mining operations were begun.



The fireplace also contains many stones of historical interest, inserted to keep alive the memory of historical events and places in Sussex County. Among these are stones from the house in Newton where George Washington spent a night; from the four old forts in the county; from the first church and the first parsonage; from the first bridge across the Delaware at Phillipsburg and the first ferry at Shawnee; and from the old copper mines at Pahaquarry, opened in 1640. Other interesting pieces are a fragment of the first millstone operated by water power in the county and a bit of stone road-marker from the old Dickertown-Owego turnpike. Other stones that are of direct interest to us are those from the highest and lowest points in New Jersey, both of which are in Sussex County. The lowest point is in the Ogdensburg mine of The New Jersey Zinc Company; the highest is at High Point, in the park which is likewise marked by a zinc memorial tablet. The mantlepiece of the fireplace is a slab of granite from the quarries at Glenwood.

The zinc tablets on this fireplace are thus in interesting and good company; and if it be true that a metal, as well as a man, is known by the company it keeps, the selection of New Jersey Zinc for these tablets is a pleasing recognition of the prestige of this metal.

The 108 names appearing on the large zinc tablet are the names of the guests invited to the dedication of the fireplace; these guests are members of the old families of Sussex County, and the tablet thus perpetuates the names of these families. The smaller tablet contains the names of the committee in charge of the erection of the fireplace.

To satisfy the curiosity of the reader, we add that the third tablet shown in the photograph of the the fireplace is of carved stone, and is inscribed with the poem "Hearth Fires" by Kenneth S. Alling.

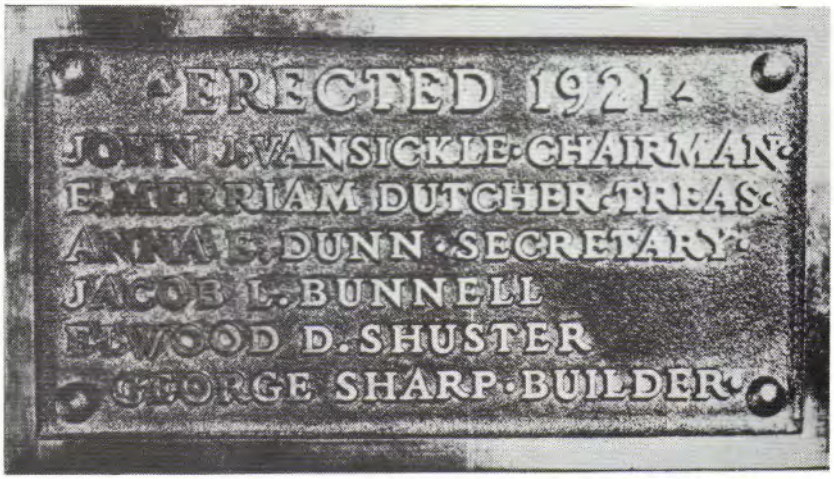
Figure 1 (left). Fireplace in the Sussex County Historical Society Building, at Newton, N.J., marked with two zinc memorial tablets.

Figure 2 (left). Large zinc memorial tablet showing names of those invited to the dedication of the fireplace in the Sussex County Historical Society Building, at Newton, N.J. This tablet is centered on the fireplace above the mantle.

Figure 3 (below). Small zinc memorial tablet, listing the names of committee members in charge of erecting the fireplace. This tablet is located just to the right of the mantle support at the left as one faces the fireplace. At first glance in the photograph, this tablet looks like a rectangular stone.

Acknowledgments

The Franklin-Ogdensburg Mineralogical Society thanks Pete J. Dunn for bringing this article to the Editorial Board's attention, and Barbara Waskowick, Curator of the Sussex County Historical Society at Newton, N.J., for her help in clarifying the specific location of the zinc memorial tablets on the fireplace. For those readers who might want to visit the Sussex County Historical Society Building to see the fireplace firsthand, please be advised that it is open only on Fridays. The phone number there is (201) 383-6010 if you want to call before making the trip. ❐



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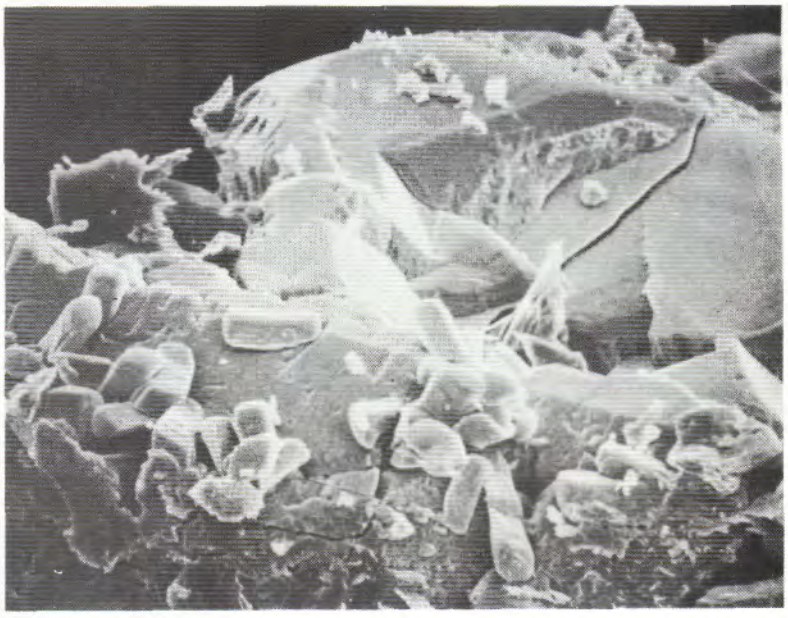
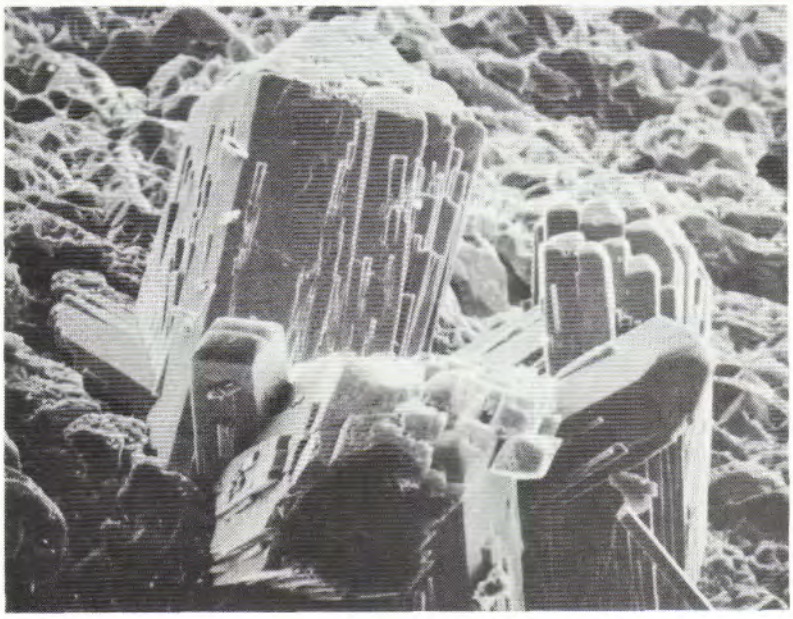
MORE ON THE MINERAL KENTROLITE FROM FRANKLIN, NEW JERSEY

John Cianciulli
60 Alpine Road
Sussex, NJ 07461

Kentrolite, $Pb_2Mn^{3+}{}_2Si_2O_9$, was reported by Palache (1935) as 0.1 mm crystals "which coat a cavity in calcite together with willemite." In 1987 Dr. Pete J. Dunn found kentrolite associated with groutite which occurs with cahnite, calcite and abundant hetaerolite, in a brown garnet, from Franklin. In this assemblage kentrolite forms tiny, 0.1 - 0.3 mm crystals, black in color, with subvitreous luster (Dunn, 1987). This material has been verified using X-ray diffraction methods, and microprobe analyses which confirmed it as Pb-Mn-silicate. Although many specimens from this assemblage were examined, kentrolite was only found in one of them.



Kentrolite was found by Herb Yeates in two different assemblages in 1988 (Yeates, 1991). In the first of these, kentrolite occurs as a sheaf-like aggregrate of needles deep red-brown, almost black in color. Their luster is remarkably splendant. This crystal aggregrate fills a cavity slightly larger than 1 mm in a small patch of cellular manganaxinite intergrown with massive patches of hancockite. There are a few well formed hancockite crystals (0.2 mm) in the manganaxinite. Barite is also present as white grains and patches. The other assemblage of kentrolite described by Yeates occurs as bright red needles from 0.01 - 0.1 mm dispersed in altered barysilite.



The most recently confirmed kentrolite was found by John Cianciulli on one specimen in the "left-overs" of the Areson collection (LA 748) purchased by the Franklin Mineral Museum. Here it occurs as individual and sheaf-like aggregrates of crystals with good faces and rounded terminations interstitial to manganaxinite, cahnite crystals and snow-white col-

Figure 1 (lower left). SEM photo showing a downward view of a hollowed cross section of a kentrolite crystal. Field of view is 0.3mm x 0.2mm.

Figure 2 (upper right). SEM photo showing minute lath-like crystals of kentrolite on cahnite. Under the binocular these crystals appear curved and are red in color. Crystal to left of center is 0.025mm x 0.008mm.

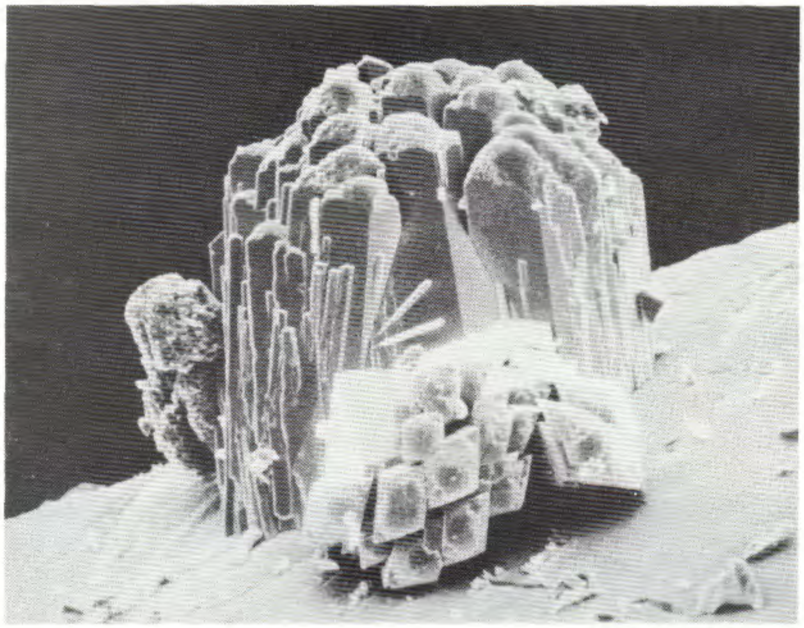
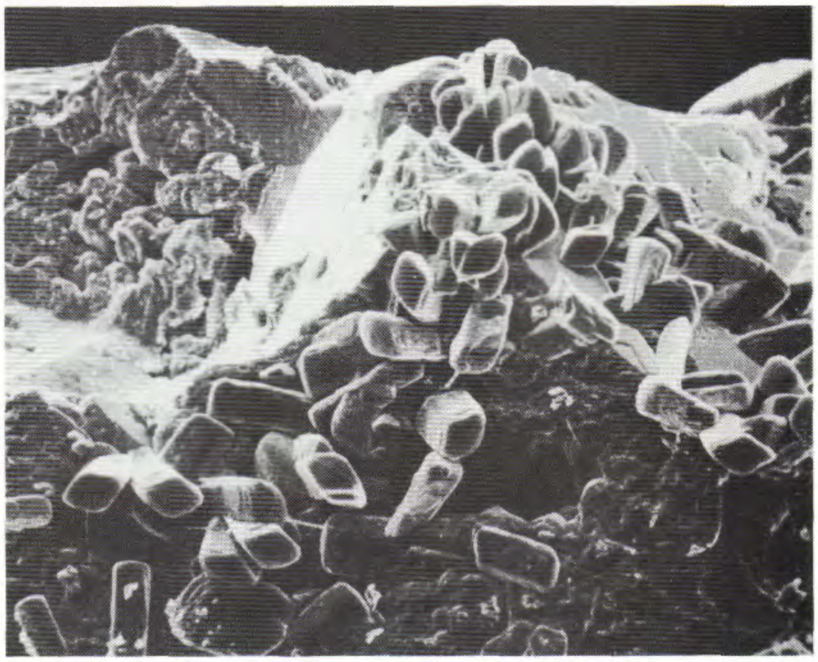


Figure 3 (above). SEM photo provides a side and top view of kentrolite crystals showing diamond-shaped cross sections. This aggregrate is on manganaxinite and measures 0.2mm x 0.2mm.

Figure 4 (right). A group of kentrolite crystals on cahnite. SEM photo; crystals are minute, measuring 0.025mm x 0.018mm x 0.016mm.



ored fibrous datolite. Individual crystals range from 0.02 - 0.3 mm in size whereas aggregrates were seen up to 1 mm. Crystals range in color from red-brown to deep red-brown to almost black. Luster varies from subvitreous to vitreous. The host assemblage for this occurrence is yellow-brown garnet, off-white colored willemite, tiny irregular grains and flakes of a soft gray mineral, possibly lead, altering copper, and a minor amount of franklinite in tiny grains up to 0.5 mm which are restricted to the willemite. Not shown in the SEM photos, is a lustrous deep red-brown crystal aggregrate of parallel growth which is attached to the fringes of a partial radial aggregate of needles of snow-white datolite. These were confirmed by Dunn as kentrolite (personal communication) using X-ray powder diffraction methods. This material is preserved in the collection of the Franklin Mineral Museum.

This rare lead silicate is turning up in a variety of interesting assemblages. Kentrolite is very rare from Franklin and has only been found sparingly in each of the confirmed specimens. A reminder to all serious collectors of Franklin minerals, "All that is deep red-brown and shiny is not kentrolite!"

Acknowledgements
The SEM photographs were taken on an ISI Super 3A by Herb Yeates. Appreciation is extended to Dr. Jan Factor for instruction in and use of the SEM facilities at SUNY - Purchase, New York.

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YEATES, H., (1991) The lead silicate minerals of Franklin, New Jersey: an SEM survey, Mineralogical Record, 22, #4, p 273-278. ❐

* *

The 13th FOMS Annual Dinner, October 5, 1991

Place: The Lyceum Hall, Immaculate Conception Church, 75 Church Street, Franklin, N.J. (Note Main Street runs dead into Church)
Time: The banquet begins at 6:30 p.m.
Price: $16.00 per person. The size of the facility limits attendees to 100. Tickets will be on sale at the September meeting or by mail. Make checks payable to FOMS. If by mail, send your check and a self-addressed, stamped envelope to:
Maureen E. Woods, R.D. #2, Box 440J, Branchville, NJ 07826. Maureen can be contacted by phone at (201) 948-3130.
Food: A buffet catered by Meyer's Bakery-Cafe, who has catered this event for the past two years, includes roast beef, roast chicken, broiled fish, assorted salads, vegetables, potatoes, pastas, assorted desserts, coffee, tea, & sodas

Master of Ceremonies- Dick Bostwick **Guest Speaker-** Peter Leavens

Auction of minerals, Franklin memorabilia, books, photographs, & mining artifacts for benefit of the Society

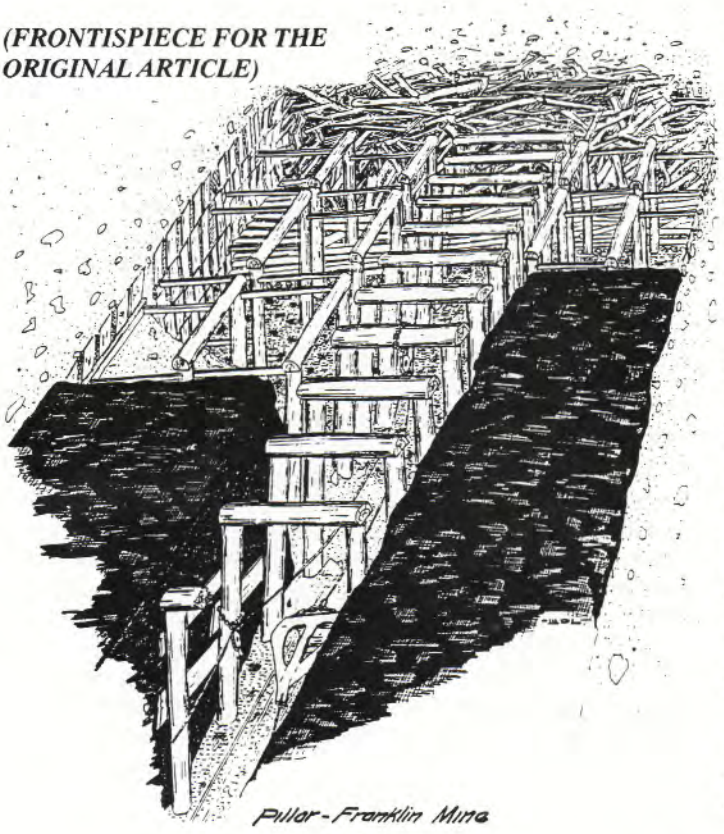
Read Editor's remarks on page 2 prior to starting this article.

This is the first installment of a two part series.

A Study of Top-Slicing at the Franklin Mine

William D. Lord, Jr., E.M.
The New Jersey Zinc Company
Franklin, New Jersey

(FRONTISPIECE FOR THE ORIGINAL ARTICLE)



PREFACE

The data presented in this paper constitute the results of studies conducted from August 27 to October 4, 1946 at the request of Mr. Clarence M. Haight, Superintendent of the Franklin Mine of The New Jersey Zinc Company at Franklin, New Jersey.

The study was never completed as originally intended but enough notes were taken to make it seem worthwhile to assemble them in some orderly form, and to that end this report is directed.

William D. Lord, Jr.

Franklin, New Jersey
August 3, 1947

INTRODUCTION

This survey was made in order to secure data pertaining to the present operation of the top-slicing method of mining as used for the extraction of pillars at the Franklin Mine of The New Jersey Zinc Company located in Franklin, Sussex County, New Jersey.

The immediate purpose of the investigation was to determine the approximate time relationships of the various operations involved — breaking, shoveling, timbering, etcetera — and to obtain a comparison of the rates of progress of the present working pillars, with an idea of uncovering possible means of improvement or, at least, determining more definitely the causes of variation of the production rates of the working pillars. Other interesting relationships have been intimated as this survey progressed and the results (*were*) tabulated.

It was hoped that at least three months would be devoted to collection of daily information so that a reasonable cycle of operations could be included and thereby eliminate discrepancies arising from periods of pillar abnormalities. However at the end of six weeks the survey was unavoidably interrupted and was not able to be resumed in time to insure reasonable continuity of data. The first two weeks were incomplete and were spent mostly to decide methods of data notation and to practice consistency of evaluation. Therefore it was decided to use the last four weeks accumulation of notes in analysis, and while they are not as conclusive as they might be they serve at least to be indicative of conditions and, if analysed broadly, (*one*) may infer the answers to many problems.

No attempt has been made to go deeply into study and interpretation of the data assembled, other than to prepare charts and tables and to accompany them with brief comments, because of the large ratio of estimation of time involved. It is believed, however, that the information herein will be provocative and will be of some aid should a more detailed study be contemplated.

GLOSSARY OF SOME TERMS USED

Breasting. Used in this paper in two senses: (1) That part of the operation of extracting a pillar slice after the center-cut has been completed, i.e., "breasting" to the stopes on either side from the center; (2) the specific act of holding back the fill of the stopes by braces and downward spiling as the ore pile is removed — the timbering sense.

Broken ore. This term usually used in conjunction with sand, in areas near old workings that have been sand-filled and where the ore surrounding has been broken and is in various stages of spalling.

Center-cut. The cross-cut or cuts in the center of a pillar slice driven from foot to hanging as the first step in mining a pillar. These are usually about eight or nine feet in width and the height of the slice.

Company-time. The guaranteed hourly wage-rate. Any work not performed on "contract".

Contract. Refers to the bonus system of the Franklin Mine, whereby the miners are paid a premium on a tons-produced-per-man basis.

Cracked-blocky ore. Solid ore, fractured, usually quite hard, and which breaks up only along slips and cracks, requiring a substantial amount of secondary blasting.

Drilling Speed. The total footage drilled divided by the total time used to set up columns and machines, drill, and dismantle set-up.

Grizzly. A pre-constructed form installed at the top of every ore raise used in the pillar slices to limit the size of ore fragments shoveled into the raise and to provide safety for the men working near the raise.

Long Set. The same as the "regular set" except that the cap is longer (usually refers to cap, 7 feet long between legs at the top, used when breasting from the center-cut — see frontispiece).

Man-hour. One man working for one hour.

Mat. That timber floor which is laid to the limits of every pillar slice and which forms the roof of the next slice.

Pillar. A vertical section of the ore-body between footwall and hanging wall, extending from top to bottom of the ore-body and from thirty to sixty-five feet wide (excluding the shaft pillar), left between stopes in the earlier stages of mining.

Pillar slice. A horizontal section of the pillar extending to the limits of the pillar and usually about ten feet in height.

Regular Set. The timber set ordinarily used in the center-cuts. Legs may be seven, eight or nine feet long and the cap is always 4 1/2 feet between legs at the top of the set.

Shoveling Speed. The total tonnage moved to ore raises divided by the total amount of time necessary to do this. Includes scraper and hand shoveling.

Soft-crushed ore. As the term indicates, this is relatively soft ore which has been crushed by heavy ground. Very difficult to drill but no fragmentation problem.

Solid ore. The ore formation essentially undisturbed by crushing, fracturing or other disformation.

Solid-blocky ore. Solid ore, usually hard, in which fragmentation is poor during primary blasting and requires substantial secondary treatment.

Solid-cracked. Solid ore which has been fractured by movement so that slips along parting planes seriously hamper drilling operations.

Stick of Powder. DuPont Gelex No. 2. Stick weighs about 0.278 pounds. Sticks of powder used not converted to pounds in this report because comparative figures only were desired.

Stope. A previously removed vertical section of the ore-body now completely filled with sand and rock.

Timbering Speed. The quantity of timbering performed divided by the total time necessary to gather, cut-to-size (if necessary) and put timber in place.

DESCRIPTION OF MINING METHOD

The orebody at Franklin is in the shape of a plunging syncline thick at the trough and with one arm severed just above the trough. It is very regular with definite foot and hanging contacts throughout. The strike of the orebody is roughly north and south and the dip about 52 degrees east.

The general mining scheme has been to take vertical east-west slices to the limits of the ore. The initial slices were, of course, the stopes (shrinkage). Thirty to sixty foot pillars were left between the stopes and it is these remnants of the orebody which are being removed today by top-slicing methods (Figure 1). The characteristics of the pillars themselves vary somewhat according to the portion of the orebody they are in, and depending upon old workings encountered which were made before plans for 100% extraction of the ore were put into effect. But the pillar method is essentially the same for all of them and results in total removal of all material in the pillar, be it ore, rock ledges, sand-fill or old construction.

In general, today, these pillars are all mined via foot-wall rock drifts and raises and are serviced through three inclined shafts also in the footwall. The foot-wall rock raise serves as the ladder-way and supply-entry. Another raise is driven along the foot-wall contact as an ore chute, and, if the pillar is a long one, other ore raises are carried up through the center of the pillar, if possible. (Figure 2) The cracked and crushed condition of some of the pillars often make it impossible to drive these additional ore chutes. The ore raises feed to chutes on one of the haulage levels below, where it *(the ore)* is trammed by trolley or battery motors to the shaft ore pockets.

The pillars are mined by top-slicing them from foot to hanging, one slice at a time. The center of the pillar is taken out from foot to hanging and the sides are removed in the retreat from hanging to footwall. Entrance to the ore pillar is gained by driving sub-drifts (4' x 5') from the footwall rock raise to the contact ore raise. These sub-drifts are approximately ten feet apart vertically and it follows that the pillar slices are about ten feet high. The

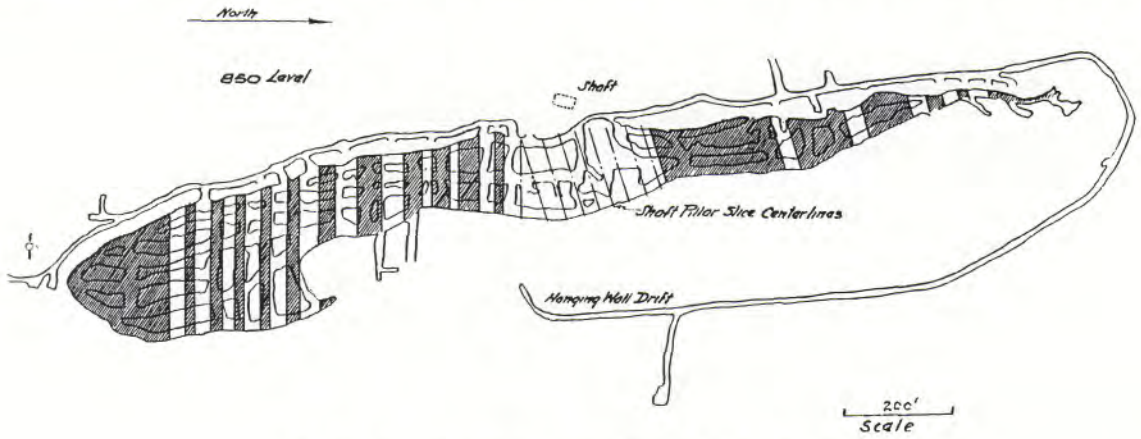


Fig 2. Plan showing pillar layouts and also old workings (filled) encountered on levels. Shaded areas mined out.

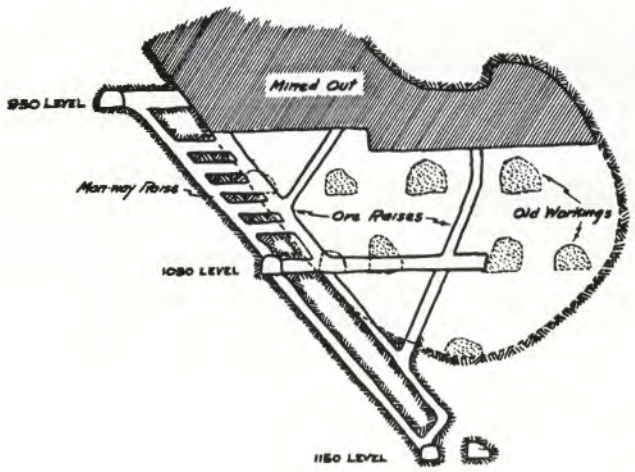


Fig. 2.
Section Showing Pillar Development and Ore-Pass Arrangement

man-ladder and timber-slide are carried down from the level (footwall drift) above to the sub-level on which the slice is to be taken. When the ore is contacted by the sub-drift the drift is enlarged around the ore-raise to the size of the center-cut which will be carried through the center of the pillar to the hanging wall. Sets are stood and the grizzly installed over the raise. The scraper is installed and blocked permanently and the pillar is then prepared for extraction. All the work up to this point is usually paid as "company time" and from this point on the remainder of the pillar is worked out "on contract".

The center-cut is driven the full height of the pillar and about eight feet wide. Sets (regular) of nine foot legs and six and a half foot caps are stood at five-foot intervals. Scraper rails are laid as the center progresses. If there is a center ore-raise to the pillar, a grizzly is installed when the pillar center reaches this point and the scraper-hoist is advanced, and the center is continued from there. When the hanging is reached, slices about ten feet in width are carried from the center and along the hanging to the filled-stopes on either side. Ten foot caps are used for the timber sets here, the first being placed about two and a half feet from the center legs (for additional center support) and then at intervals of five feet to the stope. The stopes are breasted back by spiling downward from the top until the fill is completely walled off from the pillar. Retreat is made from this point to the footwall by taking successive ten-foot slices alternatively on each side of the pillar. As the ore is removed and progress is made toward the footwall, a matting is laid on the floor of the mined out portion of the pillar. Matting consists of laying ten-inch sill timbers fourteen feet long north and south from stope to stope in overlapping rows about five feet apart. On top of these sills, and at right angles to them, three- or four-inch round lagging is laid rather close together. The lagging in turn is covered by a layer of sawmill slabs — produced when trimming logs. The ten-inch sills provide the strength and the smaller stuff keeps fines from sifting through the mat to a great degree. When about three slices — sometimes less, sometimes more —are left open by the retreat, and the mat has been laid, holes are drilled in the logs of the sets by a compressed air auger drill, powder is inserted and the overlying mat is caved to the new mat by firing electrically. The safe area which may be kept standing before it is necessary to fire down is dependent upon the weight of the overlying burden, and safety considerations. However, in no case is the pillar allowed to stand indefinitely before caving it. A tight matting overhead is essential for the top-slicing method, and it must have the opportunity to come down tightly before the next slice below is started. When the ore has been progressively removed all the way back to the footwall, the final matting is laid, all equipment is removed, the remainder of the slice is fired down, and the sub-drift is securely bratticed off so as to prevent the matting and fill above from being squeezed through the sub-drift and down the rock raise. The next slice below is then ready to be prepared and mined.

Variations of the above described method are being used to increase the production of some pillars. These variations consist of driving two centers in the pillar instead of one so that two crews may mine the pillar at the same time. The centers are driven either angled from the contact raise to the far corners of the pillar or parallel to each other if there are two contact raises available. A third method, that of driving a double-width center with a double grizzly and two scraper units and using two, three, or four men has been tried recently with success (Figure 3).

In the shaft pillar which may be up to 150 feet wide, centers are driven from the footwall, or hanging wall in some cases, on thirty foot centers and the mining is performed the same as described above except, of course, there is no breasting of the stopes except on the north and south boundaries of the pillar.

Ingersoll-Rand double-drum 2015 and Sullivan double-drum AAF-212 scraper hoists are used in the pillars with Waugh 11, hand-cranked, and Gardner-Denver CF 79 automatic machines.

Level timber-handlers, pipe-men, electricians and machinists service the pillars and keep the equipment in good order.

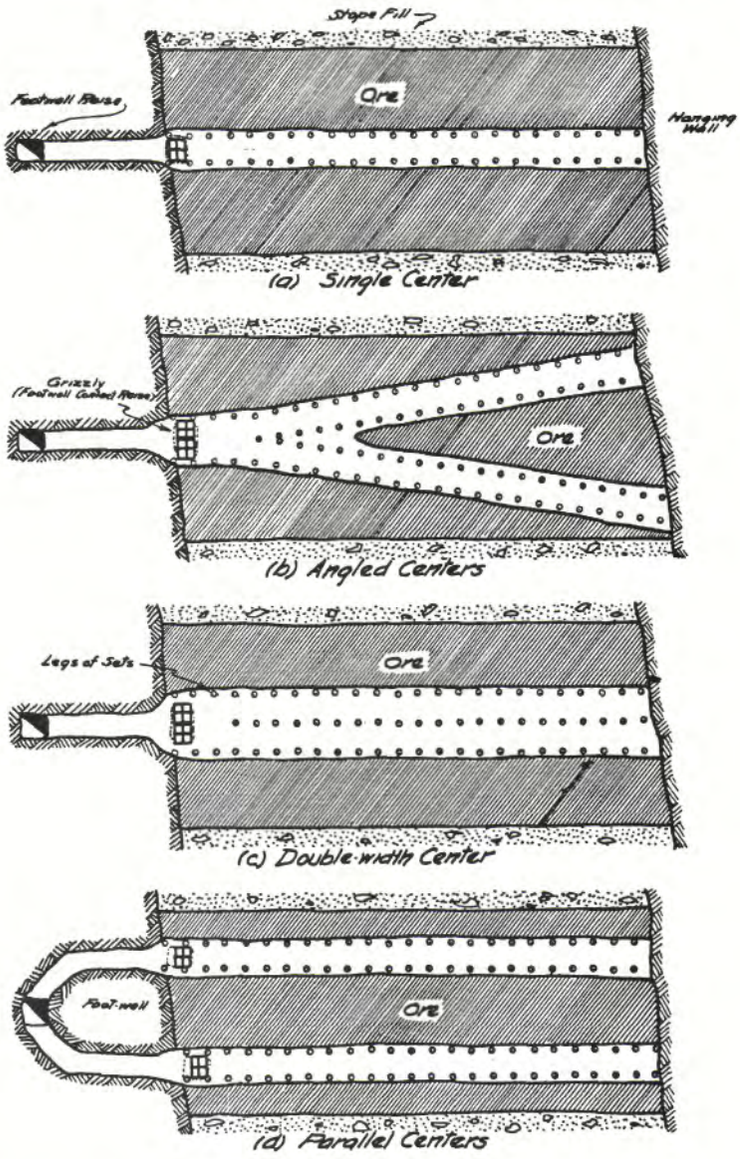
PROCEDURE

At the time of this investigation there were thirty pillars in various stages of operation from the 550 level to the 1050 level of the mine. Data was collected on all of these except two which were too near completion of their slices to warrant any attempt to record their rate of progress. As the objective was to secure as detailed information as possible of operational times involved and at the same time include all of the working places for comparison it was apparent that some method would have to be worked out to give satisfactory results for both conditions.

It was decided to make a short visit daily to each of the working places and record progress from day to day at that time. A route was worked out so that the pillars would be visited in the same order every day and thus a complete twenty-four hour picture would be had of each place. Forms were made up for ease of quick notation (Figure 4) and a small scale (1" = 30') plan made of each pillar slice in operation. Daily additions of excavation, timber sets, breasting and matting were drawn on the plans and time estimates, miscellaneous notes and operations were recorded on the forms. Larger scale plans of each place (1" = 15') were also drawn up and the data collected in the field was transferred to them for permanent record and summary (Figure 5).

The problem of making fairly accurate time estimates of the operations taking place in the previous two-shift period next presented itself and this was solved with the aid of other daily records kept by the mine office and practice. On their daily report sheets, the shift bosses recorded an approximate break-up of the eight hour period involved as to man-shifts spent on timbering,

Fig. 3.
-Arrangements of Pillar Centers-



scraping and timbering, etcetera. This data was noted in the morning before proceeding underground and more detailed approximations were started from that point. Information from the miners regarding the state of the pillar when they came on shift and questions of the shift boss regarding daily progress helped. Occasional queries as to how long it took to do this or that were presented to the miners involved, but as a general rule too much reliance was not put on this source of data. Daily visits and observations promoted ease and proficiency in making these detailed breakdowns and while they are admittedly approximate, it is believed that over a period of time and covering the number of working places that they do the averages obtained are fairly accurately indicative of true conditions.

It was at first attempted to record some idea of the miscellaneous time spent by the men getting to and from their working places, quitting early for lunch and getting back to work there-from, waiting for chutes to be pulled, waiting for smoke to clear after firing, for bosses visits and explanations, repairing hoses and pipes, going after powder, and doing the other dozens of tasks which are small in themselves and often overlooked, but which, nevertheless, add up to a goodly portion of the shift. It was quickly ascertained that it would be impossible to include these items in a once-a-day spot inspection of twenty-eight different places and so the attempt was discontinued. All operations included are proportioned over an eight hour period and it must be realized that in all of the time estimates some of the time was spent on the above mentioned miscellaneous items. Actually, as much as from one hour to three hours of every normal eight-hour shift is directly unproductive time.

FACTS CONCERNING PILLARS STUDIED

Pertinent information concerning each of the pillars about which there is data presented in this report is given here. Reference to this section in conjunction with the study of the graphs and tables which follow will aid better understanding of the contributing factors resulting in a pillar's comparative status among the others.

80

Location: On 1050 level.
Stage: Breasting - to stope on north side and to 730 pillar (solid ore) on south side.
Dimensions: 38' wide, 11 1/2' high.
Character: Sand (old drifts) and broken ore.
Temperature: Moderate.
Miners: 211, 209, 267, 255.
Remarks: *None listed.*

123

Location: 20' below 950 level.
Stage: Center-cut for first two weeks, breasting third week to stopes on north and south; cut into hanging wall fourth week.
Dimensions: 36' wide, average 9' high.
Character: Cracked, blocky ore; solid hanging.
Temperature: Warm.
Miners: 385, 386, 54, 82.
Remarks: Slice in hanging taken because of mineralization. Old cross-cut above in hanging and the presence of large "loose" caused work to be slow and cautious.

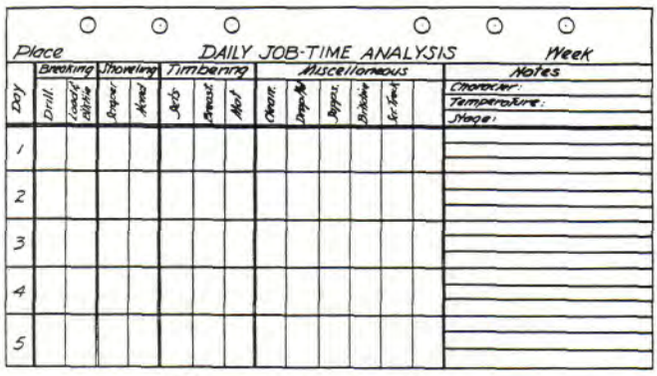
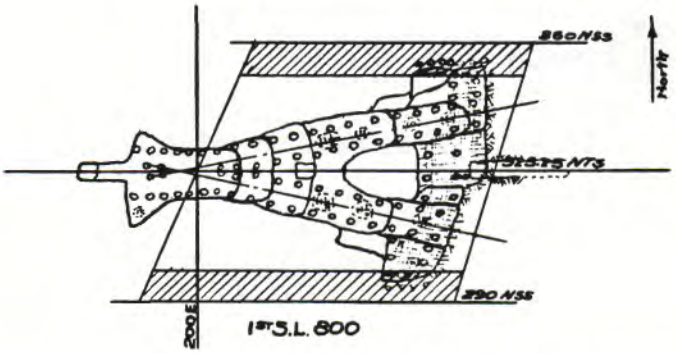


Fig. 4. Daily Data Forms

Fig. 5.
Plan and Data Sheet - Scale: 1"=15'
(Scale of this drawing: 1"=40')



[Editor's Note: This plan appeared at the top of a data sheet (not shown although the size ratio is indicated in the heading above). The data sheet showed production in terms of ore, rock, sand, total tons, cars loaded, feet drilled, sticks of powder, and caps by the week and by crew and by location. It also indicated the manhours breasting, shoveling, timbering; also, the character of the ore, stage of pillar, and the temperature.]

176

Location: 10' below 950 level.
Stage: Breasting to stopes on north and south from two centers (Pillar arrangement "d", Fig. 3) with two crews, and removal of center ore (between center-cuts).
Dimensions: 33' wide, 10' high.
Character: Hard, blocky.
Temperature: Moderate.
Miners: 375, 355, 353, 379, 53, 85, 74, 80.
Remarks: The combination of a thin (3'-4') wall of blocky ore between the center-cut and a free-running sand-filled stope on the south caused very difficult conditions of breasting the stope fill back when the ore was blasted.

229

Location: On 1050 level.
Stage: Breasting to stopes on north and south.
Dimensions: 43' wide, 10 1/2' high.
Character: Sand (old drifts) and broken ore.
Temperature: Cool.
Miners: 230, 218, 261, 268.
Remarks: *None listed*

290-U

Location: 10' below 750 level.
Stage: Double-center-cut (Pillar arrangement "b", Fig. 3) first two weeks, breasting and ore between centers last two weeks--with two crews. Stopes breasted north and south of pillar.
Dimensions: 54' wide, 11' high in centers (Small section on north footwall side: 8' high)
Character: Cracked, blocky ore.
Temperature: Moderate to warm.
Miners: 313, 337, 334, 314, 480, 459, 456, 471
Remarks: *None listed*.

290-L

Location: 20' below 950 level.
Stage: Breasting to filled stopes on north and south, and removal of ore between two centers (Pillar arrangement "b", Fig. 3) with two crews.
Dimensions: 48' wide, 10' high.
Character: Hard, blocky ore.
Temperature: Moderate.
Miners: 387, 381, 391, 392, 60, 61, 76, 72.
Remarks: *None listed.*

360

Location: 20' below 850 level.
Stage: Breasting from two centers (Pillar arrangement "d", Fig. 3) to filled stopes on north and south with two crews, and removal of ore between centers.
Dimensions: 60' wide, 10' high.
Character: Hard, blocky ore.
Temperature: Moderate to warm.
Miners: 394, 361, 374, 372, 81, 68, 56, 75.
Remarks: This pillar is the only one serviced from the 850 level on the north side of the mine, and the miners were quite often obliged to gather their own timber from the timber storage on the level.

436

Location: On 650 level, 50' below 600 (service) level.
Stage: Preparation first three weeks, begin center-cut fourth week.
Dimensions: 11' high.
Character: Sand (old drift), old concrete, broken ore.
Temperature: Moderate to cool.
Miners: 327, 303, 464, 466.
Remarks: Long (12') sets used and double grizzly installed for a double-centered slice (Pillar arrangement "b", Fig. 3).

500

Location: 10' below 550 level.
Stage: Center-cut first two weeks, breasting second two weeks — but not to filled stope.
Dimensions: 8' high.
Character: Caved rock and ore; crushed and broken course (*coarse*).
Temperature: Very warm.
Miners: 307, 331, 463, 492.
Remarks: All advance by spiling under heavy, caved ground.

509-U

Location: 30' below 800 level.
Stage: Breasting to filled stopes on north and south.
Dimensions: 67' wide, 8 1/2 to 10' high.
Character: Soft, crushed ore.
Temperature: Cool.
Miners: 447, 449, 6, 23.
Remarks: Fill in both stopes tight and hard packed — no breasting down of fill necessary. Mat overhead old and rotten — necessary for safety to cover overhead with slabbed eight-inch timber on north side near stope.

509-L

Location: 40' below 950 level.
Stage: Center-cut.
Dimensions: 10' high.
Character: Solid ore, timber.
Temperature: Cool to moderate.
Miners: 163, 189, 108, 106.
Remarks: First week spent spiling through old caved

rocks and timber.

622

Location: 70' and 80' below 600 level.
Stage: Finish matting one slice and preparation of next slice first two weeks, wide center-cut next two weeks.
Dimensions: 11' high.
Character: Solid ore.
Temperature: Cool.
Miners: 320, 321, 477, 487.
Remarks: 12' sets and double grizzly installed and double center started (Pillar arrangement "b", Fig. 3).

680

Location: 90' below 600 level.
Stage: Preparation first week and a half, center-cuts next two and a half weeks.
Dimensions: 11' high.
Character: Solid ore.
Temperature: Cool.
Miners: 316, 471, 469, 8.
Remarks: 12' sets and double grizzly for double-centers (Pillar arrangement "b", Fig. 3).

730-U

Location: On 800 level.
Stage: Breasting to stope on north side and 760 pillar (mined) on south side.
Dimensions: 37' wide, 10' high.
Character: Broken ore, sand, solid.
Temperature: Cool.
Miners: 407, 416, 4, 25.
Remarks: *None listed.*

730-L

Location: 50' below 950 level (On 1000 level)
Stage: Center-cut.
Dimensions: 11' high.
Character: Solid-cracked ore, some sand.
Temperature: Cool.
Miners: 170, 174, 121, 123.
Remarks: One raise off center — center had to be widened and timber offset for grizzly installation.

760-U

Location: On 800 level.
Stage: Center-cut for first three weeks, then removal of ore between 760 and 790 centers. No breasting down required.
Dimensions: 10' high.
Character: Solid ore.
Temperature: Cool.
Miners: 411, 441, 40, 48.
Remarks: *None listed.*

760-L

Location: 50' below 950 level (On 1000 level).
Stage: Breasting to filled stope on south and to solid rock on north.
Dimensions: 35' wide, 11' high.
Character: Solid ore and rock.
Temperature: Cool.
Miners: 153, 161, 129, 117.
Remarks: Flat hanging undercut at this stage of the pillar; no mat overhead.

790

Location: On the 800 level.
Stage: Removing pillar of ore between 790 and 820 centers.
Dimensions: 10' high.
Character: Solid ore.
Temperature: Cool.
Miners: 428, 418, 32, 26.
Remarks: *None listed.*

803

Location: 30' below 950 level.
Stage: Breasting to south of filled stope.
Dimensions: 30' wide (south of center), 10' high average.
Character: Solid.
Temperature: Moderate to cool.
Miners: 228, 162, 132, 131.
Remarks: Undercutting flat hanging at this point, no mat overhead, hanging heavy.

812

Location: 10' and 20' below 800 level.
Stage: Center-cut, breasting for first three weeks; strip raise and start sub-drift for next slice fourth week.
Dimensions: 32' wide, 12 1/2' high.
Character: Solid ore and rock.
Temperature: Cool.
Miners: 12, 11, 409, 404.
Remarks: Very short pillar.

859

Location: 10' above 800 level.
Stage: Preparation first two weeks, center-cut third week and breasting during the fourth week to filled stope on the north.
Dimensions: 17' wide (north of center-cut), average 11 1/2' high.
Character: Solid, cracked in parts.
Temperature: Cool.
Miners: 431, 419, 34, 28.
Remarks: Cribbed-chute built up from level over ore-raise to the slice level, and grizzly mounted thereon.

880

Location: 10' below 800 level.
Stage: Center-cut to sand-filled hanging.
Dimensions: 10' to 10 1/2' high.
Character: Solid ore and sand.
Temperature: Cool.
Miners: 427, 423, 7, 33.
Remarks: *None listed.*

887

Location: 20' below 950 level.
Stage: Center-cut first two weeks, breasting to filled stopes on north and south last two weeks.
Dimensions: 43' wide, 10 1/2' high.
Character; *None listed.*
Temperature: Cool to moderate to warm.
Miners: 167, 169, 116, 128.
Remarks: *None listed.*

910

Location: 10' below 800 level.
Stage: Center-cut first two and half weeks, hanging wall breasting last week and half to 940 limit on south and 880 limit on north.
Dimensions: 35' wide, 9 1/2'-11' high in center; 9 1/2'-0' in hanging.
Character: Solid ore and sand.

Temperature: Cool.
Miners: 445, 446, 22, 46.
Remarks: Old openings under solid hanging wall filled with sand; large amount of hand-shoveling necessary.

940-U

Location: 10' below 800 level.
Stage: Breasting to 910 limit on north and to filled stope on south.
Dimensions: Average 60' wide, 10 1/2' high.
Character: Solid ore.
Temperature: Cool.
Miners: 440, 448, 27, 29.
Remarks: *None listed.*

940-L

Location: 70' above 1050 level.
Stage: Breasting to filled stope on north and to 970 limit on south.
Dimensions: 35' wide, 9 1/2' high.
Character: Solid ore.
Temperature: Warm to very warm.
Miners: 221, 181, 280, 357.
Remarks: Entrance to this pillar only from 1050 level below — complicating timber service somewhat.

1000

Location: 10' below 950 level.
Stage: Footwall drift for first three weeks; begin center-cut on fourth week.
Dimensions: 10-11' high.
Character: Heavy area and old concrete ore pass, crushed ore, solid ore.
Temperature: Cool to warm.
Miners: 158, 195, 118, 112.
Remarks: Footwall drift carried near toe of pillar section left above — resulting in pushing, heavy area. Two grizzlies installed.

1008

Location: 60' above 950 level.
Stage: Center-cut.
Dimensions: 11' high.
Character: Solid, sand, some concrete.
Temperature: Moderate.
Miners: 242, 231, 264, 258.
Remarks: Only entrance to pillar is from the 1050 level. 84 man-hours spent on building crib below slice level in old opening.

A list of the miners working in the above places at the time of this survey and their corresponding numbers has been included in the appendix for reference by the Franklin Mine Staff and others who might be interested in this information. ❐

[Editor's Note: See second (and last) installment in next issue.]

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The Franklin-Ogdensburg Mineralogical Society, Inc.

The regular activities of the Society consist of lecture programs and field trips. 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** print for all activities. Except for March and November meetings, held at the Hardyston Township School on Route 23, Franklin, N.J., all others take place at Kraissl Hall, Franklin Mineral Museum, Evans Street, Franklin, N.J.

FALL ACTIVITY SCHEDULE

September 21, 1991 (Saturday)

Field Trip:	**9:00 a.m. - noon**	By special arrangement, a field trip to the newly created dump area on the **Sterling Hill Mining Company property on Plant St., Ogdensburg, N.J.** No admission fee; poundage charge of $1.00 per pound.
Lecture:	**1:30 - 3 p.m.**	Speaker/topic information will be available via special FOMS flyer. **Kraissl Hall, Franklin Mineral Museum, Evans St., Franklin, N.J.**

October 5 - 6, 1991 (Saturday & Sunday)

Show on Sat.:	**9 a.m. -6 p.m.**	
Show on Sun.:	**10 a.m. - 5 p.m.**	The 35th Annual Franklin-Sterling Mineral Exhibit and Show at the **Franklin Armory, diagonally opposite the Hardyston Township School, Route 23, Franklin, N.J.**

October 5, 1991 (Saturday)

Dinner:	**6:30 p.m. - ?**	The 13th FOMS annual Dinner, **Lyceum Hall, Immaculate Conception Church, 75 Church St., Franklin, N.J.** Guest speaker is Peter Leavens; Master of Ceremonies is Dick Bostwick. See "President's Message" on page 6 for auction details. See Annual Dinner ad on page 16 for further details regarding the price and, of course, the food.

October 19, 1991 (Saturday)

Field Trip:	**10 a.m. - noon**	**Buckwheat Dump, Evans Street, Franklin, N.J.** Admission is $3.00 plus poundage charge of $0.50 per pound.
Lecture:	**1:30 p.m. - 3p.m.**	Speaker/topic information will be available via special FOMS flyer. **Kraissl Hall, Franklin Mineral Museum, Evans St., Franklin, N.J.**

October 20, 1991 (Sunday)

Field Trip:	**9 a.m. - 4 p.m.**	**Limecrest Quarry, Limecrest Products Corporation of America, Limecrest Road, Sparta, N. J.** This is a selective interclub outing.

November 16, 1991 (Saturday)

Field Trip:	**9 a.m. - noon**	**Franklin (formerly Farber) Quarry, Limecrest Products Corporation of America, Cork Hill Road, Franklin, N.J.**
Lecture:	**1:30p.m. - 3 p.m.**	Speaker/topic information will be available via special FOMS flyer. **Hardyston Township School, Route 23, Franklin, N.J.**

COLOR SLIDES AND COLOR PRINTS AVAILABLE FROM THE FRANKLIN-OGDENSBURG MINERALOGICAL SOCIETY

Photomicrographs of Franklin-Sterling Hill minerals by Dr. Alfred L. Standfast

Each set of color slides or color prints features four different minerals from the Franklin-Sterling Hill area. There are ten different sets available. The minerals featured in the various sets are listed below; the abbreviations in parentheses indicate where the mineral was found:

Set #1--Aragonite, (SH); gold, (SH); rhodonite with garnet, (Fr); and sarkinite, (SH)
Set #2--Chalcopyrite with aurichalcite, (Fr); siderite, (SH); silver, (SH); and tephroite with willemite, (Fr)
Set #3--Copper, (SH); franklinite with chlorophoenicite, (Fr); quartz with rutile, (Fr); and smithsonite, (SH)
Set #4--Graphite with realgar, (SH); greenockite with galena, (SH); hauckite, (SH); and willemite, (Fr)
Set #5--Bostwickite, (Fr); erythrite, (SH); lead vein in ore, (Fr); and zincite with pyrochroite, (SH)
Set #6--Hodgkinsonite, (Fr), retzian-(Nd), (SH); scheelite, (SH); and thomsonite, (Fr)
Set #7--Cahnite, (Fr); clinohedrite, (Fr); goethite, (Fr); and vesuvianite, (Fr)
Set #8--Azurite with wurtzite, (Fr); gageite, (Fr); kolicite, (SH); and roeblingite on leucophoenicite, (Fr)
Set #9--Anatase, (Fr); barite, (Fr); gypsum, (SH); and leucophoenicite, (Fr)
Set #10--Aurichalcite with hemimorphite, (SH); fluorite, (SH); hancockite, (Fr); and heulandite, (SH)

Each set is priced at $5.00. If ordered by mail, indicate whether you want slides or prints and add $0.50 per set for postage and handling. Make check or money order payable to FOMS and address your order to: Stephen C. Misiur, 309 Fernwood Terrace, Linden, NJ 07036

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