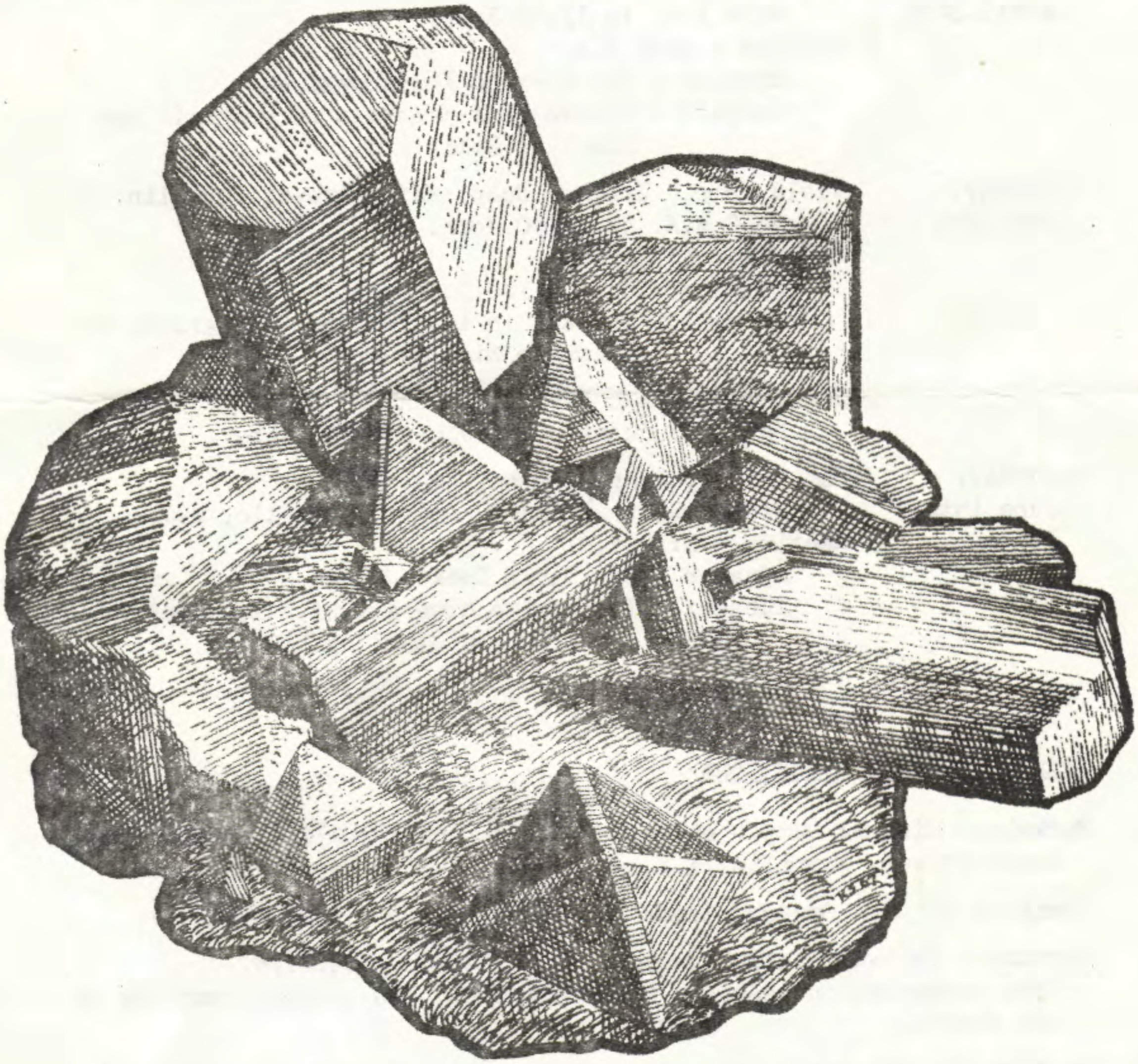
THE PICKING TABLE

JOURNAL OF THE FRANKLIN-OGDENSBURG MINERALOGICAL SOCIETY



VOLUME 15 FEBRUARY 1974 NUMBER 1

CLUB PROGRAM - SPRING 1974

All meetings for the Spring session will be held at THE NEIGHBORHOOD HOUSE, Main and Junction Streets, Franklin, New Jersey. Pre meeting activities start at 1:30 P.M. Speaker will be introduced at 2:30 P.M.

Saturday, March 16th
Field Trip - to the Franklin Mineral Museum and/or the Gerstmann Private Mineral Museum
9:00 A.M. to 12:00 Noon.
Meeting - 2:30 P.M.
Speaker - Mr. Richard Hauck
Subject - Identification of Franklin Minerals by Visible Means and Associations

Saturday, April 20th
Field Trip - The Buckwheat Dump, Evans Street, Franklin
9:00 A.M. to 12:00 Noon.
Meeting - 2:30 P.M.
Speaker - Mr. Bernard Kozykowski -
Subject - Fluorescent Minerals of Franklin and Sterling Hill, N.J.

Saturday, May 18th
Field Trip - Trotter Dump, Main Street, Franklin, N.J.
9:00 A.M. to 12:00 Noon.
Meeting - 2:30 P.M.
Speaker - Mrs. Alice L. Kraissl
Subject - Short Cuts in the Photomacrography of Franklin Micromounts

Field Trip - To Limecrest Quarry
Date and details to be announced later.

Saturday, June 15th
Family Day, Swap Session, etc. - Bodner Quarry, Quarry Road, Rudeville, N.J.
Meeting - 2:30 P.M.
Speaker - Mr. David Cook
Subject - The Humite Minerals with Associations of Franklin and Sterling Hill.

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Daily Franklin Attractions

Buckwheat Mineral Dump - entrance through the Franklin Mineral Museum, Evans Street, Franklin, N.J. Daily collecting fee.

Franklin Mineral Museum, Evans Street, Franklin. Admission fee.

Gerstmann Private Mineral Museum, Walsh Street, Franklin. Open weekends; on weekdays by arrangement. No charge, courtesy of the owners.

Trotter Mineral Dump - Main Street, Franklin (behind the Bank) Daily collecting fee.

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

F.O.M.S. OFFICERS FOR THE YEAR 1974

President	John L. Baum	70 Hamburg Tpke., Hamburg, N.J. 07419
1st Vice President	Bernard Kozykowski	DeKay Lane, Livingston Manor, N.Y. 12758
2nd Vice President	Robert Thomas	802 Lindsley Drive, Morristown, N.J. 07960
Secretary	Wilfred Welsh	67 Lilline Lane, Upper Saddle River, NJ, 07458
Treasurer	Robert Thomas	802 Lindsley Drive, Morristown, N.J. 07960
Asst. Treasurer	Mrs. Robert (Pat) Thomas	802 Lindsley Drive, Morristown, N.J. 07960

TRUSTEES

Henry M. Althoen '75	Ewald Gerstmann '75
Lee Areson '74	Frederick Kraissl, Jr. '75
Bruce Barr '74	Al E. Lord, '75
Louis Benedict, Jr. '74	John E. Sebastian, '75
Frank Z. Edwards '74	Alice L. Kraissl, '75 (Alternate)

COMMITTEE CHAIRMEN

Auditing	Bernard Kozykowski
Field Trip	John Sebastian, Al E. Lord
Field Trip Registration	Trudy Benedict, Betty Sebastian
Historical	Fred Kraissl, Jr., John L. Baum
Identification	Bruce Barr, Ewald Gerstmann, John L. Baum
Membership	Robert Thomas, Henry M. Althoen
Mineral Sales	Lee Areson
Museum Coordinating	John L. Baum
Nominating	Henry M. Althoen
Publicity	P.E. Scovern
Program	Fred Kraissl, Jr., Bernard Kozykowski
Publications	Frank Z. Edwards
Safety	John Sebastian, Al E. Lord
Social	Betsey Althoen, Alice Kraissl
Welcome	Jenny Areson

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F.O.M.S. NOTES

With both pleasure and pride we welcome the new administration for the year 1974 of the F.O.M.S. John L. (Jack) Baum is probably the best qualified person in the entire club for the office of President. His former position as Geologist of the Franklin Mine and his interest and familiarity with Franklin minerals provide a background of Franklin mineralogy that is unsurpassed. As Curator of the Franklin Mineral Museum and a working member of the F.O.M.S. he has graciously and willingly shared his knowledge with all collectors. A fine person and complete gentleman, he will provide excellent leadership for our organization.

Bernie Kozykowski, 1st Vice President, is another splendid choice. Dedicated and a diligent worker, he continues to expand his interest in and knowledge of Franklin minerals and mineralogy. All of this, he too shares willingly with members of the F.O.M.S.

Another capable and diligent worker, Bob Thomas, is 2nd Vice President. He continues to prove his devotion to Club activities by also remaining as Treasurer, ably assisted by his wife, Pat.

Bill Welsh also stays on as Secretary. To that office he contributes ability, dignity and hard work. We can not ask for more.

The Board of Trustees and list of Committee Chairmen shows several new names. Such new officers are members with high qualifications. To remain vital and continue to grow, every organization must attract and promote willing, active members to contributing positions. Our new officials are highly welcome and we hope their contributions prove to be both interesting and beneficial. We also salute the returning Trustees and Committee Chairmen. These members have proven their value by past performance and we are sure that they will again promote the welfare of the Club.

There is always a need of interested members to fill committee positions under the committee chairmen named above. If you would like to serve on any committee, please contact the chairman directly. John Sebastian and Al Lord, particularly request additional members for the Safety Committee. This is the most important committee in our organization. Through their efforts the F.O.M.S. has achieved a splendid record and reputation for Safety. It is this record and reputation that enables our Society to schedule field trips to locations that are often inaccessible not only to individuals but also to other groups. To insure a continuing welcome to choice collecting locations, a strong Safety Committee is essential. Please volunteer your services to either Mr. Sebastian or Mr. Lord.

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Please read the Spring Calendar Page very carefully. In the interests of economy, the Executive Board has decided that no separate Bulletins be issued for the months of March and September. The Picking Table, which should be received by our members in ample time, will give details of the events to be held in these two months, thus saving separate mailings.

Also note that the Energy Crisis has affected our activities. For many years, to accomodate those members who could not attend Saturday events, the F.O.M.S. has scheduled activities on Sundays in March and November. This year, because of Sunday driving uncertainties, all events are being scheduled for Saturdays only. We realize this may disappoint some members, but we really have no choice in the matter.

Furthermore, the Sussex County Board of Education has ordered that all school buildings be closed over weekends. This means that we have lost our long time meeting place, the Hardyston School. Our new meeting place will be The Neighborhood House, which is located on the northeast corner of Main and Junction Streets, Franklin. This is in the center of town and the location of the only traffic light. Cars may be parked in a municipal lot, a half block away on Main Street and Parker Street, or in legal parking places on the surrounding streets.

The Neighborhood House is of some interest to collectors. When the Franklin Mine was in operation this building was the recreational center provided by the New Jersey Zinc Company for the use of the miners. After the mines were closed, the Company deeded the property to the Borough of Franklin. Since then it has been the meeting place for all sorts of civic and community affairs. The first two Kiwanis Annual Franklin Mineral Shows were held in this building and the F.O.M.S. was born in a meeting room on the second floor on Saturday, October 9th, 1959.

Program Chairman, Fred Kraissl, has scheduled an excellent list of speakers for the Spring program, which offers what amounts to a short course in Franklin mineralogy. The speaker for the March 16th meeting will be Mr. Richard Hauck, who will advise on the "Identification of Franklin Minerals by Visible Means and Associations". Dick, first President of the F.O.M.S., is an acknowledged Franklin expert and a top collector and dealer. His observations on identification helps will be of assistance to all collectors.

The field trip on Saturday, March 17th will be to the minerals museums in Franklin - The Franklin Mineral Museum, Evans Street, and the Gerstmann Private Museum on Walsh Street.

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Dues for the year 1974 are now payable. Please use the handy form on the last page for transmission to our Treasurer.

Please note that dues remain at $3.00 for the year. The Executive Board voted to retain dues at this figure for 1974. However, dues for 1975 will be increased to $5.00. This increase is made necessary by increased costs, particularly of preparing and mailing our monthly Bulletins and The Picking Table. We hope that it will not prove to be a burden to our members.

In the October 1973 Bulletin, Ex-President Henry M. Althoen mentioned the possibility of a dues increase. This prompted a letter from member Walter S. Detrick, which we reprint here because of its interest to other members. We also hope that this represents the opinion of all our members.

"Dear Mr. Althoen:

During several years of membership in the FOMS (originally by courtesy of Carl S. Oeder) I have wondered how the Society managed to operate at the prevailing low level of its membership dues. Therefore, your president's message as regards financing FOMS Bulletin, October 1973, was read here with special interest. Since it appears that you and your staff may wish to hear from members on this subject, I should like to make known my willingness and readiness to go along with any plan deemed adequate to increase the Society's income. Your excellent publication, The Picking Table, alone is worth considerably more to me than the present annual cost of membership. Some plan for subscription or direct subsidization of the publication would seem to be justified, plus an ample boost of the annual fee. However, I leave these matters to you men at headquarters who are best qualified to judge requirements and know the membership.

Cont.

My appreciation to you and all of your people whose combined efforts ably serve to commemorate Franklin/Ogdensburg: its minerals, mining, history, literature and contemporary activities, by means of a well managed and reputable Society dedicated to the principles and objectives worthy of one of the world's great and unique mineral/ore/mining districts.

In several respects Franklin is well known to me. My formal mineral collecting was begun at the picking table of the Franklin mill (1931), when a college student. As geologist I served The Zinc Company at its Austinville, Va. operations (Bertha Mineral Division). We often visited our many friends resident in Franklin and Ogdensburg: and as a Zinc Company employee I also visited underground at Sterling Hill. More recently I corresponded with John Albanese, whose Notes on the Minerals of Franklin and Sterling Hill I find as unique as are the minerals themselves. The Picking Table has helped to keep me informed of that broad and interesting field of literature, both past and present, with current activities, all generated by the fascinating world of the Franklin environment."

With very best wishes - Sincerely, Walter S. Detrick.

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Which brings us to The Picking Table. Until this issue, as Editor of the Picking Table, I possessed one asset which helped me greatly in obtaining information. This was mobility. In my previous position as Mill Representative, I regularly visited 21 states in the East. This often gave me opportunity to see collectors, dealers, museums and universities, contributing to my knowledge and providing news items for this journal. Now that I have been retired, that mobility is gone. Also removal to Florida has taken me away from home base - Franklin and Ogdensburg - where the action is. Nevertheless, Jack Baum has requested that I continue as Editor of The Picking Table. To do a satisfactory job news will now have to come to me through correspondence. Therefore, I ask each and every member to send me, when available, information on anything that concerns Franklin and/or its minerals. Such letters and information will be greatly appreciated and acknowledged. Please address all mail to Frank Z. Edwards, 1050 S.E. Fairfax Avenue, Palm Bay, Fla., 32905. (Telephone 305-723-4966). Collectors visiting or living in the area are also invited to drop in for a visit and conversation.

Next to seeing a fine specimen, I enjoy reading about one. Although many excellent specimens of Franklin minerals are widely scattered in collections and museums, there are very few descriptions of outstanding pieces in Franklin literature. Our members are particularly invited to send me descriptions of what they think are outstanding Franklin specimens in any collection for publication in The Picking Table. Such descriptions should make a very interesting feature for this publication.

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We are happy to report that due to the constant and persistent efforts of Bernie Kozykowski, that Charles Palache's Professional Paper #180, The Minerals of Franklin and Sterling Hill, Sussex County, New Jersey, will again be available soon for purchase by our members. This Paper, one of the great monographs in American Mineralogy, was originally published by the Superintendent of Documents, Washington, D.C. at a selling price of 35¢. It was a small edition and sold out in a few years. In 1960, through the efforts of the North Jersey Mineralogical Society, a second edition of 2000 copies was printed and sold at $2.00 per copy. About half of this issue was purchased and resold by the F.O.M.S. Later, at our request a second printing of the 1960 edition was made (about 1965); about 1500 copies of this reprint were purchased by the F.O.M.S. and the Franklin Mineral Museum. In 1970 we were informed no more copies were available and efforts were begun to obtain another reprint. Despite constant inquiry and the help of several New Jersey Congressmen, Bernie could get no information or action from the Government Printing Office until this past summer. Then, upon the promise of the F.O.M.S. and the Franklin Mineral Museum to purchase the entire edition of 2000 copies, the GPO consented to quote a price. They then quoted a cost which would have required a selling price of $6.00 per copy. This made Bernie very unhappy. He then turned to private industry and finally found a printer who would do the job for a more reasonable figure. After due consultation, the F.O.M.S. and the Franklin Mineral Museum jointly agreed to sponsor the reprint of Palache by this printer. This reprint will differ only from past editions by showing the two organizations as the publishers and by the inclusion of the Memorial of Charles Palache by Clifford Frondel. Arrangements have also been made for hard cover copies as well as the usual paper covered issues. Both will be available to members by mail or at meetings from our Treasurer. When ready, further details for ordering will be given in a bulletin.

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On March 15th the Franklin Mineral Museum and the Buckwheat Dump will reopen for the 1974 season. During the winter months Curator Jack Baum purchased several collections and advises that attractive specimens will be available for sale to collectors. Some new display specimens have also been acquired.

Ewald Gerstmann announces the donation by Madeline Frey of the late Edmund Frey's collection of Franklin cabachons to the Gerstmann Private Museum. Ewald also has made several changes in the physical layout of his Museum, all for the better, and has added some new specimens to his collection. He again invites all collectors to visit the Museum; a prior phone call is appreciated.

The Trotter Dump is open to collectors. Nick Zipco continues as the Dump custodian.

These Franklin attractions are always of interest to Franklin collectors. Despite gasoline shortages, a visit to the area and these localities is still recommended and will be self rewarding.

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A list minute note from Jack Baum contains some information that will be appreciated by our members.

"The Frondel-Baum article (on the genesis of the Franklin Ore Body) will be published in the next month or two in Economic Geology. A very limited number of reprints of this article will be available to the authors for purchase. We will take advantage of this offer and turn these few copies over to the F.O.M.S. and the Franklin Mineral Museum for resale.

Also please let our members know that the Franklin Mineral Museum has purchased a number of unusually fine specimens from the Edwards collection. There will be placed on sale at the Museum from time to time during the year. They will not be cheap but then quality never is.

Word is that the arsenate mineral zone is all gone. Guard well your symplessites, kottigites, pharmacosiderites and other exotics. Also, production of sussexite may be nearing its end as the deeper portion of the Sterling ore body (the North Ore Body) nears exhaustion. However, don't despair as other goodies are sure to take their place, and our younger members will outlive the Sterling Mine. Now is still the time to buy good specimens. They may not be cheap any longer but when will they get any cheaper? European dealers are now looking for Franklin minerals and paying good prices for the quality ones. Rhodonite and franklinite crystals are particularly in demand."

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Fluorescent Mineral Notes

Several collectors, with justification, have complained that very little news of Franklin fluorescents has been given in past issues of the Picking Table. And, as it so often happens, as soon as they complained, several news items concerning fluorescents came to hand. The most important is validated.

Fluorescent Zincite

In the February and August 1972 issues of The Picking Table fluorescent "Adamite" was reported from Sterling Hill. Identification was made on the basis of chemical tests, optical measurements and fluorescent response. For final verification, specimen material was submitted to Harvard University. There it was determined that most of the specimens were a mixture of willemite and zincite and that none of the material was adamite. Then more specimens were examined by David Cook. These proved to be almost pure zincite with no willemite admixed. Several specimens of this zincite were sent to the New Jersey Zinc Company laboratory at Palmerton, Pa. for reconfirmation and analysis. In November 1973, Mr. N. F. Farber verified that these specimens were definitely zincite and not a mixture of zincite and willemite. Therefore, specimens may now be correctly labeled "Fluorescent Zincite". The purest specimens fluoresce a cream yellow long wave, duller under short wave. When willemite is admixed the response turns toward the green side, increasing with the percentage of willemite in the mixture. The cause of the fluorescence in this particular type of zincite has not yet been determined although Mn appears to be the probable activator.

Mr. Farber's analysis is quoted herewith: Zinc, very strong, more than 10% - Manganese, medium to strong, 1 to 10% - Alumin and Iron, weak to medium, .10 to 1.00% - Calcium, faint to weak, .01 to .10% - Silicon and Magnesium, faint, 0.1% - Chromium, very faint to faint, .001 to .01% - Nickel, very faint, .001% - Lead, extra faint, .0001%.

The history of this zincite is a good example of the problems involved in the verification of a mineral. The first specimens that came up from the mine were a mixture of zincite and willemite plus sufficient arsenic to appear in chemical analyses and lead to a tentative identification as adamite. Later specimens contained little or no arsenic and were varying admixtures of zincite and willemite. Finally, sufficient material was received that showed that the purest mineral was a fluorescent zincite. Another example that shows how rarely natural minerals are found that conform closely to the ideal chemical formula.

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Freak Fluorescents

In preparing material for the 1973 Franklin Kiwanis Show, I came across three unusual, or in my own words, freak fluorescents, since the specimens are normally non fluorescent. The first was a specimen from Sterling Hill that came up in October 1966. The surface of this piece is almost entirely covered by clear quartz crystals, averaging 3/8" in diameter and height, on a matrix of fine grained greyish calcite. Under the short wave light the quartz crystals fluoresced a good yellow, close to the esperite reaction, but had no response long wave. A closer inspection showed that the quartz crystals were not fluorescing; that some unknown mineral under the quartz but on the surface of the calcite was producing the fluorescence. The identity of this mineral has not yet been determined.

At about the same time, a different quartz specimen in the Gerstmann collection attracted some attention. This quartz also fluoresced a yellow short wave and orange long wave. Pat Gross asked Jack Baum to determine the cause of the fluorescence. Also, there is a thin film locally between the quartz and the matrix which fluoresces long wave in a color characteristic of sphalerite. The quartz itself does not fluoresnce."

The second unusual fluorescent I found in October was a piece of relatively pure leucophoenicite which fluoresced a deep red under short wave, a very weak red under long wave. Leucophoenicite is non-fluorescent. An acid test seems to indicate that sufficient calcite is admixed with the leucophoenicite to prompt the fluorescent response.

The third freak response to come to my attention was from a roeblingite specimen. This also fluoresced a weak red under short wave with no response long wave. I discussed this with Jack Baum and he informed me that he has encountered red fluorescent roeblingite on a number of occasions. Normally, roeblingite is non fluorescent. Here again it is probable that enough calcite has been admixed with the roeblingite to trigger the fluorescent response.

These four specimens illustrate the normal causes for freak fluorescent responses. 1) surface coatings of a fluorescent mineral on a non fluorescent species. 2) A fluorescent mineral under a transparent non fluorescent species. 3) A fluorescent mineral admixed with a non fluorescent host.

Such responses sometimes cause confusion as to whether a species is fluorescent or non fluorescent. If freak fluorescents are found early in the investigation of a mineral, and particularly if specimen material is scarce, a mineral may be listed as a fluorescent species when actually it is not and proved so by later and more extensive examination. Nevertheless, such occurrences are interesting and prized by collectors.

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Gypsum or selenite is a species that is normally considered non fluorescent. However, some collectors claim that gypsum from Sterling Hill fluoresces a light blue short wave. Questioning or examination of such specimens proves that these responses are found only in bruised areas of gypsum with clear gypsum on the same specimen non responsive. Now, John MacDonald advises that all specimens he has handled of micro crystals of selenite from Sterling Hill (these came up in 1965-6 from an area adjacent to the Mud Zone) fluoresce a good red under short wave. Have other collectors noticed a similar response? We would like to know if this occurrence is always fluorescent or if only a few pieces show a response. Please check and advise if you have such specimen material.

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Recently Gene Clynes gave Bernie Kozykowski a piece of grey willemite from Sterling Hill that came up recently. This willemite fluoresces the usual green short wave but also produces a good orange phosphorescence. Bernie is trying to determine the cause of this unusual phosphorescence.

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Mineral Notes

Groutite 4 /MnO.OH/ Hey 7.18.9

Another new mineral for the Franklin validated list. Last summer a number of specimens from the old Gage collection were offered for sale. One specimen purchased by Peter Chin has a matrix of brown andradite garnet with one face displaying good cahnite crystals plus a spray of 1/4" shiny black crystals labeled "pyrolusite". Peter submitted this specimen to the Smithsonian for analysis and Mr. Peter Dunn has identified these crystals as groutites. This is the first find of groutite at Franklin; an antimonian groutite from Sterling Hill was identified in 1967 by Cornelius Klein, Jr. and Clifford Frondel. (See The Picking Table of February 1968).

Tenorite

In the last issue of The Picking Table, verification was noted of tenorite from Sterling Hill. The specimen, from the Jack Baum collection, came from the copper alteration zone and with the same associations as the chrysocolla occurence. The tenorite is black pitchy with a conchoidal fracture found as small masses with azurite and malachite in a vein cutting franklinite ore.

Allactite/McGovernite

In July 1872, Ewald Gerstmann forwarded a Sterling Hill specimen to Mr. John S. White at the Smithsonian Institution for verification. This specimen, which came up in June 1972, was from the 1010 stope, about 10 ft. below the 800 ft. level. On one face of this ore specimen is a bronze fibrous crust and a small vug containing several well formed micro crystals of a lavender to smoky color. Verification by Mr. White has determined that the crystals are allactites. The bronze crust (originally thought to be McGovernite) is still unidentified. Palache states that allactite was previously found at Sterling Hill in 1929 as a few clusters of pale brown crystals in cavities in a calcite vein together with beautiful clear green crystals of willemite, pale blue fluorite and a white fibrous mineral packed about with willemite. The current find is the first to be recorded since the Palache description. The miner who made the discovery states that only six pieces were found in this locale.

20 ft. below the allactites, a few pieces of McGovernite were discovered. The occurrence is very sparse and not at all spectacular. The McGovernite occurs as a thin bronze, pulverant to fibrous crust on ore. It is not attractive and does not compare in quality with the original find which was made on the 900 ft. level in 1927. Less than ten pieces of the new material were found before mining activities destroyed the location.

Erythrite

Another specimen forwarded by Ewald Gerstmann to Mr. White at the Smithsonian for verification came from a muck pile in the old workings on the 1400 ft. level. This material has been laying there for many years. The matrix of the specimen is a white calcite with areas of chalcocite and minor amounts of sphalerite and malachite. On one face is a 1/8" diameter rosette of clear crystals. These have been verified by Mr. White as erythrite crystals. Erythrite from this area is rare but Mr. White advises that the Smithsonian does have two specimens in their collection. One was purchased from John Albanese in 1954; the other was acquired with the Herbert Seaman collection.

Ewald advises that two more pieces with the same matrix and from the same area but showing blue crystals on one face have been sent to Mr. White for verification.

Neotocite

Jack Baum has just advised that neotocite from Franklin has again been verified. In his words "Two specimens of this questionable species have recently come to light in the collections of Alice Kraissl and Frank Edwards. The Kraissl specimen shows neotocite in smooth shining black botryoidal surfaces, broken, shining, almost pitch like surfaces, and in triangular black facets and one rhombohedral shape apparently inherited from one or more replacement source minerals, all implanted on and amid hodgkinsonite crystals. The specimen is about thumb nail size. Verification was made by David Cook at Harvard.

The Edwards specimen, now in the Franklin Mineral Museum, is a 2"x 3" piece of altered banded franklinite-willemite ore probably from a shear zone, on an open fracture surface on which the smooth black shining botryoidal neotocite lies as though it had flowed like lava. Veinlets of the neotocite also invade the specimen. As in the case of the Kraisl specimen, transmitted light shows red through thin edges.

Neotocite is probably not as rare as formerly believed, although brown serpentine has been mistaken for neotocite. The fracture of Franklin neotocite is far rougher and more metallic appearing than that of serpentine. Picture a botryoidal franklinite and the image will be close."

The question mark next to Neotocite on the list of Franklin-Sterling Hill Verified Minerals may now be removed. But purists may still disapprove of this listing. Neotocite is poorly defined and not all authorities, including Hey, accept it as a valid species. However, pending redefinition, we feel it should be shown on our list.

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Fluoborite

Recently I received a letter from two young men, Messrs. Lance E. Kearns and Frederick Bopp III, Department of Geology, the University of Delaware, regarding an interesting find. We quote their letter below; additional information must await publication of their paper now in preparation.

"Upon making the discovery of Fluoborite at the Edison Quarry, we prepared the following notice of occurence. Formal publication of the discovery is planned for the near future, but we felt that the F.O.M.S. should get the first notification. We would be more than happy to have the following short notice appear in the February, 1974 issue of The Picking Table.

Fluoborite - A New Locality at the
Edison Quarry, Rudetown, N.J.
by
Lance E. Kearns and Frederick Bopp III
Department of Geology, Un. of Delaware

A new location for the rare mineral Fluoborite was discovered on the recent F.O.M.S. field trip to the Edison Quarry, Rudetown, N.J. Fluoborite is a fluorine bearing hydrous magnesium borate with the formula $Mg_3(BO_3)(F,OH)_3$. The identification of the mineral has been verified by X-ray powder patterns, optical properties, and by a partial qualitative chemical analysis by E.D.A.X. (Energy Dispersive Analysis of X-rays). The mineral has a strong cream response to short wave ultraviolet radiation."

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Research Reports

Alleghanyite

"The Crystal Structure of Alleghanyite" $Mn_5 [(OH)_2 (SiO_4)_2]$ by P.J.Rentzperis. Zeitz. Krist., volume 132, 1970, pages 1-18. Min. Abst., Dec. 1971, vol.22, number 4, page 261. Abstract:

"The crystal structure of alleghanyite from Bald Knob, N.C. has been determined using three dimensional, equi-inclination, diffractometer data and taking into consideration its relation to chondrodite. The unit cell dimensions are a)8.2747 b)4.8503 c) 10.7198 Å, B) 108.64° Z=2, space group $P2_1/c$. The structure consists of slightly distorted SiO_4 tetrahedra and highly distorted Mn octahedra of three different types: Mn(1) octahedron with one OH group, Mn(2) octahedron with two OH groups, and Mn(3) octahedron with no OH group. These octahedra share two, three and four edges with adjacent octahedra and one or two edges with isolated SiO_4 tetrahedra. Within an octahedral layer serrated zigzag octahedral chains repeat themselves periodically along the a-axis; they alternate with similar chains of octahedral voids, also repeating themselves along the a-axis, but displaced by c/2. Adjacent chains are linked together by isolated SiO_4 tetrahedra."

Hetaerolite

"Hetaerolite from the Rodna Base Metal Ore Deposit: A new Occurrence" by George Udubas, Joachim Ottemann, and George Agiorgitis - American Mineralogist, volume 58, Nov-Dec. 1973, pages 1065-1068. Abstract: "A new occurrence of hetaerolite from Rodna/Rumania is described and detailed mineralogical and chemical investigations undertaken."

From the "Introduction" - "The mineral hetaerolite ($ZnMn_2O_4$) which is chemically similar to the mineral hausmanite was first described from the Sterling Hill deposit, New Jersey by Moore (1877) and later studied in detail by Palache (1910). Other localities where hetaerolite is known to occur include the Franklin mine, New Jersey and Leadville, Colorado (Frondel and Heinrich, 1942). Recently Hewett and Fleischer (1960) have reported hetaerolite from the Contact Mine, Grant County, New Mexico, and the Lucky Cuss Mine, Tombstone, Arizona. They as well as Ramdohr and Frenzel (1956) before them, expressed the opinion that hetaerolite - as a product of weathering of Mn-bearing zinc ores - is much more abundant than previously thought. Now hetaerolite has been found in the Pb-Zn deposit at Rodna, Rumania, probably the first locality in Europe. -- The hetaerolite discussed here was found in cavities within the crystalline limestones where it occurs in a matrix of limonitic ochre together with broken off fragments of galena crystals, which have been partially coated by cerrussite. Macroscopically the hetaerolite is usually stalactitic but occasionally botryoidal in appearance. Under reflected light it is gray, and similar to magnetite."

Sarkinite

"Crystal Chemistry of the Basic Manganese Arsenates: V. Mixed Manganese Coordination in the Atomic Arrangement of Arsenoclasite" by Paul B. Moore and JoAnn Molin-Case - the American Mineralogist, volume 56, Sept.-Oct. 1971, pages 1539-1552. From the "Introduction"

"Arsenoclasite, $Mn_5(OH_4)(As_4)_2$, was first described by Aminoff (1931) as a new species from the famous Långban mines, in the province of Varmland, Sweden. It occurs in the paragenesis adelite-sarkinite-arsenoclasite in calcite filled fissures cutting hausmannite impregnated dolomitic marble from the "Irland" drift. Both arsenoclasite and sarkinite crystallized later than the adelite but it is difficult to decipher the relative positions in time for the first two species. Flink (1924) discussed the occurrences of sarkinite at Langban and noted some specimens with the characteristic flesh red color of sarkinite but with one perfect cleavage. As shown by Aminoff, "sarkinites" with perfect cleavage proved to be arsenoclasite."

Scapolite

"The Fluorescence of Scapolite" by W. A. Runciman - Journal of Gemmology, volume 13, 1973, pages 225-226. Min. Abstracts, December 1973, volume 4, number 4, page 399. Abstract:

"It appears certain that sulphur rather than uranium is the principal activator for the characteristic strong yellow fluorescence shown by some scapolites."

Zinc Manganese Cummingtonite

F. C. Hawthorne and H. D. Grundy have determined "The Crystal Structure and Site Chemistry of a Zinc Manganese Cummingtonite by Least Squares Refinement of X-ray and Mossbauer Data". Complete paper in the American Mineralogist, volume 58, November-December 1973, page 1103.

Langban

"The Flink Collection of Unknown Langban Minerals; A Progress Report." By Paul B. Moore and F. E. Wickmann - Geol. Foren Forh., Stockholm, volume 93, 1971, pages 289-301; Min. Abstracts - June 1972, volume 23, No. 2, page 152. Abstract follows:

"Among the 506 unknown Langban specimens assembled by Flink, 282 have been investigated and identified. Of 104 minerals represented 22 are new to science and 27 new to Langban. The most frequent species include svabite, hedyphane, garnet, berzeliite, fluorite, tephroite, calcite, baryte, allactite, tilasite, and scheelite. Fluorite, baryte, and calcite occur in a wide range of parageneses. Hedyphane, tephroite, allactite, and tilasite often occur in a range of subtle colours and closely resemble each other and other species."

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Allen W. Pinger

In the last issue of The Picking Table, we presented the first installment of Allen W. Pinger's opening address to the F.O.M.S. Symposium in June 1961 (second and last portion later in this issue). At that time, we had very little biographical data on Mr. Pinger. Since Jack Baum had worked under Mr. Pinger, we requested him to supply additional information. As usual, he complied graciously with details that enable us to appreciate more fully Mr. Pinger and his work.

Allen W. Pinger - by John L. Baum (Nov. 5, 1973)

Allen Wainwright Pinger was born at the turn of the century and lived for a number of years in Fallon, Nevada. His later school years were spent in Leadville, Colorado where he was raised by an aunt who was a school teacher. He served in the Army at the close of the first world war, seeing action fighting the 'flu epidemic at the base in Georgia. He attended Harvard and was forced by economics to take a year off to raise funds, which he did by teaching English at the Berkshire School in Massachusetts. One of his students was VanWyck Mason, later a noted novelist. Returning to Harvard to complete his studies in geology, Pinger came under the influence of L.C. Graton, noted mining geologist and hydrothermalist, whom he assisted in the early studies of polished sections of opaque ore minerals. At that time, the New Jersey Zinc Company had no company geologists, hiring consultants when problems arose. Graton was such a consultant at the Company's Gilman, Colorado mine, and he recommended hiring of the young Harvard geologist. Pinger started work with the Company in the early twenties at Gilman, later visiting all the Company's mines and prospects, and living at Austinville, Virginia and ultimately, until retirement at the end of 1950, at Franklin, New Jersey. Ping, as he was known, married Adelaide VanEvera whom he met while briefly employed in the Minnesota iron country before coming with the Zinc Company, and they have a daughter Caroline, married and a resident in West Germany, and a grandchild.

The Graton influence could be seen in the reports on Ping's prospect examinations. Masters of the language and not easily misled by Nature, both could recognize and convey the important features of a mineral showing, and both were responsible for the development of enormous ore reserves, Graton in South America and Pinger in Canada. These triumphs were due to great talent it is true, but they were also the result of careful, painstaking, often boring and repetitive effort, carried out under conditions imposed by the wilderness or a foreign atmosphere which compounded the problems. These men were giants in their field. The Pingers live in retirement in Salt Lake City where following his work with the Zinc Company, Ping ran a consulting business for a number of years.

Social life at Franklin was conducted on well established lines, and the salaried personnel of the upper echelons held occasional picnics or even teas for the younger men and their wives. These refined social affairs were a world apart from the black flies, paddle blisters, canned beans and aching muscles of exploration work in the wilds of Quebec yet such was the world of the geologist in those days when the motel and helicopter were yet to be invented, and getting in to the prospect was half the battle. Pinger handled both worlds well, and was always a gracious gentleman. If he knew any swear words I can't recall him using them, and his tolerance of others was exhausted only in the face of incompetence and complaints.

Pinger's winters were spent on reports, library research, and compiling the results of the Company's exploration efforts. All past work was boiled down into thick looseleaf books referred to as bibles, illustrated with geologic maps of states, counties, townships and prospects, and each prospect succintly described each examiner's conslusions given, and all references annotated. The junior members of the department painstakingly colored the maps, and woe betide anyone caught sharpening a colored pencil in the pencil sharpener. Razor blades were to be used for this purpose, as any other type of point was brittle, and the supply of pencils was limited. Everything was done in five copies, and the bibles were worth their weight in gold. They not only cost that much to create, but other companies would have paid well for them.

The detailed mapping of the Franklin and Sterling mines was initiated by Ping in 1931, and following his careful work, a succession of geologists continued the project at Franklin, adding refinements until the internal structure of the Franklin mine became apparent. These maps and sections were studied by Dr. Clifford Frondel at Harvard and did much to confirm his theories concerning the origin of the Franklin ore body.

In the summers Ping and I visited prospects. Sometimes we used public transportation, often his car, and later Company vehicles. We rode bush planes, canoes, and a horse, waded icy streams and worked seven days a week, on occasion without meals. We slept in style at the Chateau Frontenac, and we shared a sofa one night in an overcrowded hotel. We stood in the vestibules of Canadian troop trains and hitched rides in Maine with the mail truck which became a taxi when the end of the rural route was reached. We disembarked from a steamer at 4 A.M. at a deserted pier of a remote fishing village, and happily caught the same boat at the same time a few weeks later. And of course there was the Allard Lake adventure, when we had been away from home for six weeks, flew into the lake with three days' food, and were abandoned, to live on pancake flour and snared rabbits until desperation drove us to seek our way to the coast of Quebec, staggering across the tundra carrying suitcases. Out of this trip came the Allard Lake titanium venture, the result of Ping's recognition that this was indeed the elephant country for which we had been looking.

Except for the necessarily classified nature of his work in a competitive industry, Allen Pinger would be far better known.

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(Part 2)

A REVIEW OF
MINERALOGICAL, GEOLOGICAL AND MINING ACTIVITIES
IN THE FRANKLIN AREA
SUSSEX COUNTY, NEW JERSEY

Allen W. Pinger

The Origin of the Deposits

In a letter written about 1900, a former mine superintendent makes this statement: "The origin of the ore I am not so familiar with, as it has been my misfortune to hear and read of a good many causes for this body of ore being at Mine Hill, I hardly know which to accept."

Ries and Bowen, in 1922, and Palache in 1935, summarize existing hypotheses, which will now be reviewed briefly:

The hypothesis of igneous injection was first offered by Rogers, in 1836; and was suggested by Spencer, in 1908, in the following terms: "The deposits of ores... are derived from the same source as the invading magmas... and were deposited as replacements...or many have been injected." Spurr and Lewis, in 1925, regarded the ores as injected vein-like dikes of sulphide magma that lost their sulphur by a later distillation.

The hypothesis that the ores were originally sediments deposited contemporaneously with the limestone, and subsequently metamorphosed with it, was first proposed by Kitchell, in 1855, and was maintained by the New Jersey State Geologists for 40 years. Nason, in unpublished reports to the Company, favored this view, modified only by the contact metamorphic effects of the intrusive pegmatites.

The hypothesis of the development of the ores by means of contact metamorphism related to the pegmatites was first proposed by Nason, in 1890; and was adopted by Kemp, in 1893, with this difference: Nason suggested sedimentary ores metamorphosed by contact effects of the pegmatites; Kemp considered the ores to be introduced as part of the contact metamorphism. Lindgren, in 1919, places the deposits tentatively with those related to igneous metamorphism. Ridge, in 1952, suggests that the deposits belong in Lindgren's later pyrometasomatic classification.

The hypothesis of replacement from magmatic solutions was suggested by Spencer, in 1908, as an alternative to igneous injection; and was advocated by Ries and Bowen in 1922. Spencer, in later unpublished reports to the Company, favors the idea of replacement.

The hypothesis of an original mixed sulphide emplacement in limestone, extensive oxidation to remove sulphur, and subsequent metamorphism to their present state, was first formulated by Palache in 1915, and published in 1929; it was also suggested by Tarr, in 1929; it was also suggested by Kemp in his "Ore Deposists of the U.S. and Canada," in 1907.

Comments

Appraisal of such hypotheses as "igenous injection," "igneous vein-dikes," "magmatic solutions," and "contact metamorphism" is difficult because of nomenclature and definition, which have varied greatly over the years.

Sedimentary origin fails completely to explain the localization of the ore at the two mines. We may state positively that we have not found a single occurrence of franklinite, willemite, nor zincite except at Mine Hill and Sterling Hill. We believe that the ore favors certain horizons in the limestone; but we doubt that the ore occurs at the same horizon at the two localities. A bed of sedimentary zinc ore would surely be of more general distribution.

Spencer, and Ries and Bowen make the same significant suggestion, namely, that the ore minerals were deposited as replacements in the limestone. This replacement character of the ore minerals with gangue calcite and silicates, is the best argument hypotheses of igneous injection.

The hypothesis of replacement deposition in limestone as mixed sulphides, oxidation of the sulphide ore, and metamorphism to the present oxide - silicate ores, is attractive; certainly the greater part of the zinc supply of the world has come from mixed sulphides and their oxidation products. Usually, the manganese contents of these ores is small, but in a few instances the proportions of zinc, iron, and manganese are similar to the Franklin-Sterling occurrence. The most serious objection to this hypothesis is based on the uniform distribution of Zn Fe and Mn in the Franklin-Sterling deposits. The oxidized mixed sulphide ores characteristically show marked segregation of the metals in the oxidized products. Many examples are known; one only will be cited:

At Leadville and Gilman, Colorado, the primary ores are mixed sulphides of zinc, and iron, with manganiferous carbonate gangue; the proportions of Zn, Fe, and Mn are approximately the same as at Franklin-Sterling. These sulphide ores are manto-like replacements in the Leadville limestone, and have been extensively oxidized for long distances below the outcrops. The oxidized ores are well segregated; a capping of limonitic gossan containing only minor manganese, and almost no zinc; below the limonite, an iron-manganese rich gossan, with only occasional minor zinc content; and below and well removed from these gossans are large deposits of calamine and smithsonite. The iron and manganese oxides occupy the site of the original sulphide ore; the oxidized zinc ore has removed to the foot wall limestone which it occupies partly by replacement, and partly by solution cavity filling. Large tonnages of these three oxidized ores have been mined: The limonite contained appreciable residual lead and silver, and was a desirable flux for lead smelting; the Fe-Mn oxides were low in silica, phosphorous, and base metals, and had a ready sale to the Colorado Fuel and Iron Company furnaces at Pueblo. The oxidized zinc ores, as shipped, contained from 25% to 40% Zn, with negligible Fe-Mn content. Metamorphism of such a deposit would result in anhydrous oxides of iron, iron-manganese, possibly some zincite, and willemite; all in discrete deposits; uniform distribution of the Zn, Fe, Mn would be lacking; and the walls of the zinc ore would be very irregular from solution and replacement effects.

The foregoing criticism leaves a mutilated picture. We have arrived at no strong convictions concerning origin; as Nason observed in 1890; "the existing state of knowledge does not afford an adequate basis for deciding between the....hypotheses." Now, 70 years later, with one of the two known ore bodies mined out, we are still unable to decide.

As all of you will attest, Franklin and Sterling are remarkable for the number and variety of minerals found; many are rare, and a few are unique to the locality. May we obtain clues to the origin from these minerals?

A friend of mine once said; "Some geologists can argue illogically from false premises to a valid conclusion." Be that as it may, let us attempt to set up a sequence of geological events that will fit in with regional and local structure, and account for the elements present in this unusual assemblage of minerals. For some of the premises assumed we have fair evidence; for others evidence may be lacking, or may be subject to divergent or even contradictory interpretation.

1. The regional deformation and metamorphism of the gneisses and White limestone was accomplished prior to the deposition of the ores. This stage involved folding, reorganization and recrystallization of the original components of the rocks with essentially no addition of material. The resultant minerals would be the quartz and rock forming silicates of the gneisses, and a long suite of minerals in the limestone including; calcite, dolomite, diopside, tremolite, phlogopite, graphite, chondrodite, cuspidine, spinel, and minor sulphides and fluorite. These are all found widely throughout the area, and contain lime, magnesia, alumina, silica, carbon, carbonate, and minor iron, sulphur, chlorine, and fluorine.

2. Local intrusion of the gneisses and limestone by granitic rocks and associated pegmatutes. Some of these intrusives were accompanied by the introduction of abundant iron and silica and pneumatolytic materials, followed by a weak but persistant sulphide mineralization. This pegmatitic stage is marked by addition of such minerals as feldspar, allanite, apatite, axinite, epidote, fluorite, scapolite, titanite, tourmaline, vesuvianite, and wollastonite; the abundant iron oxides magnetite and specular hematite; the iron rich skarn silicates; garnet, pyroxene, amphibole, and mica; and sparse local ilmenite and rutile. Materials added would include abundant iron, silica, potash, soda and alumina; and minor berllia, titania, boron, chlorine, fluorine, arsenic, phosphate, and sulphur. The last weak sulphide mineralization would add very minor quantities of iron, copper, lead, molybdenum, nickel, zinc and sulphur.

This pegmatitic stage is probably most extensive at Franklin, less extensive at Andover and Roseville, and minor at most of the other iron ore localities; at all are found the iron ores, iron rich skarn silicates, and varying quantities of the other minerals. Zinc and manganese are notable for their almost complete absence except in very minor amounts in the last weak sulphide mineralization.

3. Here we enter uncharted wilderness; if Franklin were not unique we might have sign posts to guide this way; certainly none are obvious, and we must blaze our own trail. Following the close of the pegmatitic stage there was an interval, probably brief--- only sufficient to block channelways to all localities except Franklin and Sterling, - and then a flood of new material arrived. This is notable for abundant zinc and manganese, almost wholly lacking in the pegmatitic stage, and probably also abundant iron and silica. These we visualize as replacing large volumes of limestone in certain structurally favorable beds adjacent the pegmatitic-skarn masses of the earlier episode, and locally replacing the garnet of the skarn. The magnetite deposits along the footwall of the limestone, just above the gneiss appear to have been effectively sealed, were not replaced, and contain no zinc nor manganese. At Sterling there is less massive garnet, and a suggestion that there may have been a large amount of disseminated magnetite and pyroxene emplaced in the limestone during the pegmatitic stage. Replacement of a part of the complex folded structure resulted in an ore similar to the ore at Franklin, but partial replacement of the disseminated magnetite-pyroxene resulted in the large volume of low-grade material containing only thin lenses of normal franklinite-willemite ore, in which much of the franklinite has low zinc and manganese content. In the discontinuous bands of willemite, we find pyroxene and chondrodite that are incompletely replaced by willemite.

This stage of mineralization is characterized by the ore minerals; franklinite, willemite, and zincite, the more common gangue silicates; tephroite, rhodonite, zinciferous and manganiferous pyroxenes and amphiboles, hardystonite, roepperite; manganiferous calcite and occasional rhodochrosite; and the zinc spinel, ghanite; the rare anhydrous silicates; barysilite; glaucochroite, hodgkinsonite, larsenite, and margarosanite; the oxides hematite and manganosite; and very rarely, native copper and lead.

In the immediate vicinity of the earlier pegmatites and skarns, we find a great assortment of minerals that have presumably resulted from interaction between the pneumatolytic minerals and the zinc-manganese mineralization. Here are found many of the rare and unusual minerals, containing arsenate, borate, chloride, fluoride, phosphate, sulphate, and hydrate. Probably because of the volatile constituents, these minerals have been subject to re-arrangement and some migration, and are often in veins and cavities in skarn and ore.

Materials added are essentially Zn, Mn, and Fe, and silica; the complete lack of sulphur is possibly the feature that makes the mineralization at Franklin unique among mineral deposits of the world. As sulphides, the association is common; without sulphur, it is unknown.

4. The next recognizable stage of mineralization came after a long geological interval, possibly accompanying post Ordovician folding and faulting. This mineralization is weak, but persistent; small veins and breccia fillings occur in the White limestone ore and are locally found in the Blue limestone, particularly above the north end of the Franklin ore body.

Minerals present are: vein dolomite, quartz, calcite, barite, and fluorite, with specular hematite, and base metal sulphides of iron, copper, lead and zinc.

The same assemblage of minerals is found at Sterling, and is assumed to be the same age; although it cannot be traced directly into the Blue limestone, as at Franklin.

Materials added are essentially Ba, Fe, Cu, Pb, Zn, S, F, and sulphate, all in very minor amount, and may possibly be derived from the ore bodies, by a solfataric leaching, and deposition as sulphides.

5. A last stage of a very weak mineralization accompanied the intrusion of the "trap" or minette dikes, which are believed to be of Triassic age. This mineralization added very small amounts of quartz, albite, ilmenite, fluorite, calcite and a few zeolites.

6. Weathering and oxidation of all the foregoing stages of mineralization have produced the usual minerals such as anglesite, azurite, calamine, cerussite, cuprite, gypsum, hydrozincite, limonite, malachite, smithsonite, and psilomelane; and the unusual minerals arseniosiderite, chalcophanite, desaullesite, descloizite, hydro-hetaerolite, manganbrucite, manganite, and pyrochroite. The large deposits of calamine at Sterling Hill were derived primarily from the oxidation of locally abundant sphalerite and pyrite, with some zinc being contributed by willemite decomposed by the acid sulphate solutions from the weathering sulphides. Where sulphides are lacking, there has been no appreciable weathering of the normal franklinite-willemite ore along the outcrops at either mine.

A final review shows that of nearly 200 minerals listed, about half are of general distribution, and half are restricted to Franklin and Sterling; of these, about 30 are unique. In the sequence of events outlined above, all of the elements present-- except zinc and manganese-- are accounted for in the regional metamorphism, the pegmatitic stage, and the late weak suphide stage. These stages are of common and widespread occurrence. The feature that makes the area unique is the stage of mineralization that added large quantities of zinc, manganese, and iron completely devoid of sulphur.

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