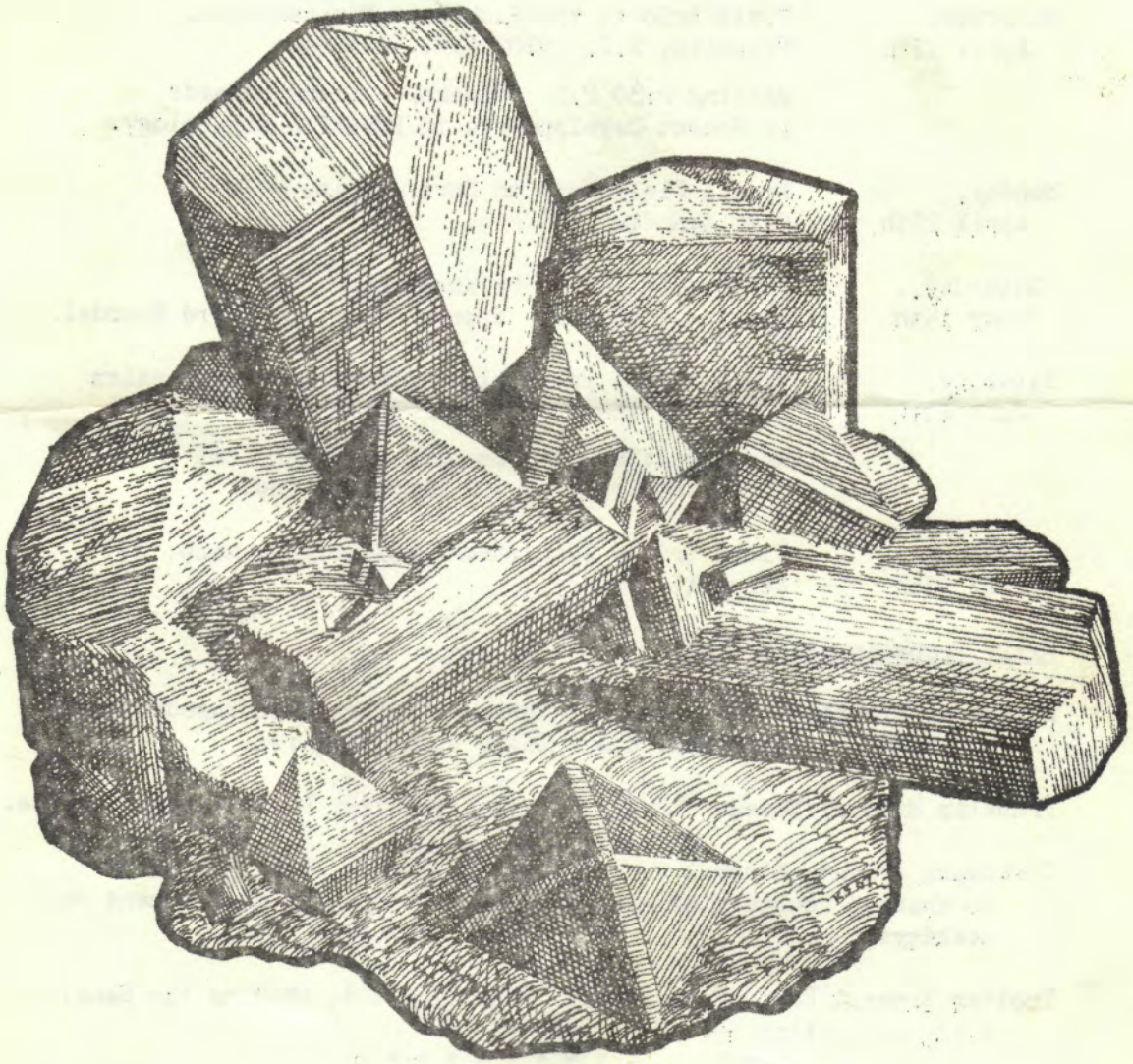
THE PICKING TABLE

JOURNAL OF THE FRANKLIN·OGDENSBURG MINERALOGICAL SOCIETY



VOLUME 12 FEBRUARY 1971 NUMBER 1

CLUB PROGRAM - SPRING 1971

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

Sunday, March 21st	Field trip to the Franklin Museum and/or The Gerstmann Private Museum, Franklin, N.J. 9:00 A.M. to Noon. Meeting 2:30 P.M. Speaker - Richard Hauck re Minerals of Franklin and Brazil.
Saturday, April 17th	Field trip to the Buckwheat Mineral Dump, Franklin, N.J. 9:00 A.M. to Noon. Meeting 2:30 P.M. Speaker - Frank Edwards re Recent Developments in Franklin Mineralogy.
Sunday, April 25th	Fossil Field Trip to Port Jervis, N.J. 9:30 A.M. to 3:00 P.M.
Saturday, May 15th	Field trip - to be announced. Meeting 2:30 P.M. Speaker - Dr. Clifford Frondel.
Saturday, June 19th	Field trip - Intra club outing and swap session at the Trotter Dump, Franklin, N.J. Meeting 2:30 P.M. Speaker - Milton Leet re The Minerals of the Cornwall Mine.
Sunday, July 10th	Field trip - Bethlehem Steel Company Mine, Cornwall, Pa.

Daily Franklin Attractions

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

Franklin Mineral Museum - Evans Street, Franklin, N.J. - entrance fee.

Gerstmann Private Mineral Museum - Walsh Street, Franklin, N.J. No charge, courtesy of owner. Open weekends; by arrangement on weekdays.

Trotter Mineral Dump, Main Street, Franklin, N.J. (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 W. Borgstrom; the cover by Kenneth Sproson.

F.O.M.S. OFFICERS FOR THE YEAR 1971

President	Alice L. Kraissl	Box 51, No. Hackensack, N.J.
Vice President	Henry M. Althoen	319 Third St., Dunellen, N.J.
Secretary	Louis Benedict, Jr.	442 So. 21st St., Irvington, N.J.
Treasurer	Bernard Kozykowski	Box 634, Port Jervis, N.Y.
Asst. Treasurer	Robert Thomas	802 Lindsley Drive, Morristown, N.J.

TRUSTEES

Lee Areson	'72	Frank Z. Edwards	'72
Bruce Barr	'72	Alexander F. Knoll	'71
John L. Baum	'71	Frederick A. Kraissl	'71
William Clinton	'72	William Spencer	'71
John E. Sebastian	'71		

F.O.M.S. Notes

The officers of the F.O.M.S. that served so capably in 1970 have been reelected and will again administer club affairs for 1971. President Alice Kraissl and the Executive Board have promised an active and interesting year for our members. Field Trip Chairman John Sebastian and Program Chairman Fred Kraissl have lined up a fine complement of field trips and speakers for our meetings. Attendance at these events by our members and their guests will be well rewarded.

President Kraissl has appointed the following committee chairmen:

Auditing - William Clinton, 31 Orange St., Bloomfield, N.J.
Field Trip - John Sebastian, 36 Roxbury Drive, Kenvil, N.J.
Field Trip Registration - Trudy Benedict, 442 So. 21st St. Irvington, N.J.
Historical - Henry M. Althoen, 319 Third St., Dunellen, N.J.
Identification - John L. Baum, Route #23, Hamburg, N.J.
Membership - Bernard Kozykowski, Box 634, Port Jervis, N.Y.
Mineral Sales - Henry M. Althoen, 319 Third St. Dunellen, N.J.
Museum Coordinating - John L. Baum, Route #23, Hamburg, N.J.
Nominating - John Sebastian, 36 Roxbury Drive, Kenvil, N.J.
Publicity - Betsy Althoen, 319 Third Street, Dunellen, N.J.
Program - Frederick Kraissl, Jr., Box 155, No. Hackensack, N.J.
Publications - Frank Z. Edwards, 100 West Shore Trail, Sparta, N.J.
Safety - John Sebastian, 36 Roxbury Drive, Kenvil, N.J.
Social - Mr. and Mrs. Robert Thomas, 802 Lindsley Drive,Morristown, N.J.
Welcoming - Jennie Areson, 21 Irwin St., Middletown, N.Y.

All chairmen need more members to fill out their committees. If you would like to serve on any of these committees, please contact the chairman directly.

At the October 1970 meeting it was proposed that the Constitution of the F.O.M.S. be amended to provide for a 2nd Vice President. This motion was approved and the first reading of the new Amendment was made at the November meeting. Second and final reading of the new Amendment will be made at the March 1971 meeting.

Dues for 1971 are now payable. Some new mineral literature is also available from the Club. Please use the form on our last page for easy ordering and remittance.

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We regret to report the death of Leighton S. Donley of Cornwall, Pa., on December 20th, 1970. Many of our members gratefully remember the courtesies and hospitality extended by Mr. and Mrs. Donley on our field trips to Cornwall. The Franklin Ogdensburg Mineralogical Society, on behalf of all its members, extends its sympathy to Mrs. Donley and her family.

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Members of the F.O.M.S. who attend our field trips regularly will remember Mr. and Mrs. Frederick Bird, who are now on one of their periodic visits to Europe. On October 19th, 1970 they wrote to our Treasurer, Bernie Kozykowski, a most interesting letter which I am sure all of our members will enjoy.

Dear Mr. Kozykowski:

"We would like to obtain a copy of the Picking Table for August 1966, Volume 7, Number 2, to make our collection of Picking Tables complete from the beginning, as we find them very useful for reference.

We much regret missing the Fall 1970 trips of the F.O.M.S. but we have been able while here to do some hunting in Switzerland and also to join the Swiss Association of Mineral Hunters and Collectors with whom we had a very interesting time at their Fall Meet at the end of September.

We also spent two weeks in the Valais in Switzerland at the beginning of August mostly at the well known Lengenbach Mine in the Binntal. This mine is worked by the University of Berne and its associates for scientific purposes. The public can only work the dump, which suited us very well, as when the mine is working, they dump from a push car five to six times a day so there is always fresh material to work with. The rock in which the crystals are found is a sugary dolomite, very pleasant to work. This small mine so far has 60 different minerals in it of which 15 have been found nowhere else in the world. The majority of these minerals are sulphasalts. (Interestingly enough, there is a location in Canada - Madoc, Ontario, where similar minerals are found but in which the element Antimony is substituted for the Arsenic of Lengenbach.) We were fortunate enough to find Baumhauerite, Dufrenoysite, Lengenbachite, Rathite, Sartorite - all exclusive to Lengenbach. Also Binnite, which is a Tennantite but with a different crystal form from that found e.g. Colorado. We also found some very small crystals growing on another sulphasalt which could not be identified. Thanks to Dr. S. Valdes of the Berne Museum of Natural History, these are being investigated by Dr. Graeser of the Berne University.

(Cont.)

Mrs. Bird also found some colorless apatite crystals of very beautiful multiple faceted form near Reckingen in an avalanche track. We also worked the well known Gribelsbach location near Fiesch where we found very pale green fluorite crystals and stilbite and heulandite.

The S.V.S.M. Fall meeting was very different from anything we have done with the F.O.M.S. It is run rather like a technical convention. First, there are a number of excursions each led by an expert in mineralogy and generally restricted to 30 to 40 people traveling by bus, to avoid the difficulty of parking cars. These excursions while you may find some good specimens are NOT planned for that but primarily to teach the participants the different rocks and formations and where and in what associations of minerals to look for the different crystals that can be found in the area of the excursion. Hard hats and safety committees are not in evidence! We were fortunate enough to find small specimens of zircon, brookite and monazite crystals on the excursion we took which lasted three days covering the Grimsel area, Lengenbach, Martigny and the Salt Mine at Bex. We also had a lecture day in which eight excellent lectures were given by specialists including one on cleaning mineral specimens. The final day was given over to an excellent Mineral Show (called Bourse there) in which minerals were sold and exchanged. We acquired a very nice rose fluorite, a milarite and a synchisite specimen.

We both hope the club enjoyed a good Fall and expect to be back next June.

With best wishes from us both,

Sincerely yours,
(Mr. and Mrs.) Frederick V.G. Bird.

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Member Don Newsome of Van Nuys, California, announces the formation of a Fluorescent Mineral Society. The objective of this organization will be to advance the hobby of fluorescence by sharing knowledge and experience in collecting, identifying, displaying and trading fluorescent minerals. For area members field trips and information seminars are planned. However, residence in the Southwest is not necessary as newsletters and other means of communications will be utilized. These interested in any aspect of fluoresnce such as photographing fluorescent minerals, the different uses of ultraviolet lamps, the study of other types of luminescence in minerals, etc. should contact Mr. Don Newsome, 7039 Encino Avenue, Van Nuys, California, 91406 or phone (213- 881-2164).

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Franklin Mineral Museum

On January 9th, the Board of Trustees of the Franklin Mineral Museum acted on several measures of interest to F.O.M.S. members and other mineral collectors. Permission was granted to purchase a portion of the John Hendricks collection. Many of these specimens will be placed in the permanent collection of the Museum. Duplicates will be sold in the Museum Sales Shop. Also, approval was given for the purchase of a Polarizing Microscope and a Spectrograph. These instruments will be used for mineral identification in the Museum laboratory, another step in improving the educational facilities of the Museum.

The Franklin Mineral Museum will reopen on March 15th. Hours, Monday through Saturday, 9:30 A.M. to 4:45 P.M.; Sunday, 1:00 P.M. to 4:45 P.M. Admission charges - $1.00 for adults; 50 cents for high school students; 25 cents for younger children.

The Buckwheat Dump, which is now under the supervision of the Franklin Mineral Museum, will also reopen on March 15th. Hours and admission charges are the same as those for the Museum. However, this year prospecting on the Dump with ultra violet lights will be permitted on the nights of the 1st and 3rd Saturday of the month.

Group reservations for either the Museum or the Buckwheat Dump may be made by writing to the Franklin Mineral Museum, Mrs. Florence Hansen, Manager, Box 76, Evans Street, Franklin, N.J. 07416 or phoning (201) 827-3481 during Museum hours or (201) 827-9286 at other times.

Mrs. Hansen advises that the Sales Shop at the Museum has acquired a large variety of Franklin minerals plus minerals from other localities - all for sale at reasonable prices - mail orders accepted. There is no admission charge to the Sales Shop and you are invited to stop in to examine the material for sale.

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Sterling Hill Mine

Late last year the New Jersey Zinc Company and the Borough of Ogdensburg reached an agreement on differences over the multimillion dollar assessment against the Sterling Hill Mine located in Ogdensburg. The assessment was cut to $4,000,000 for 1970 and provides for a 4% depletion allowance on its land value annually for the next 25 years to offset devaluation of assets by the gradual extraction of the ore body.

This would indicate that at current level of operation there is a proven ore reserve of 25 years.

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An Abbreviated Manual of Franklin Minerals

A new book is now available for everyone interested in Franklin minerals. Asked for his opinion about this new book, Jack Baum had this to say:

"For the weekend collector of Franklin-Sterling Hill minerals, An Abbreviated Manual of Franklin Minerals will be a handy supplement to the older texts presently available. Written by a hobbyist for hobbyists, the book stresses the easily determined properties of the majority of Franklin-Sterling Hill minerals. It is presented in loose leaf form so that the collector can add his own observations on additional minerals on the blank forms included. The basic data and remarks for each mineral is presented, one mineral to a page, with ample room for additional notes. If the volume is used as intended, it should become a valuable addition to the owner's library.

The author, Ervan F. Kushner, is Presiding Judge of the Paterson, N.J. Municipal Court, a retired U.S. Army Colonel, and a mineral enthusiast. With a lawyer's attention

to detail, Judge Kushner has included helpful lists of Franklin minerals catalogued by color of streak, by fluorescence, abbreviations of chemical elements, and a glossary of terms which will be of great value to the amateur interested in collecting at Franklin."

The "Abbreviated Manual" will be available at any of the F.O.M.S. meetings or can be obtained by mail - see the form on our last page.

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The Paterson(N.J.) Museum

Through an unfortunate blind spot, prior to the last issue of The Picking Table, we had failed to mention the fine collection of Franklin and Paterson minerals at the Paterson Museum. Then, in paying tribute to the late Bill Casperson, we told only a small part of the whole story. Gene Vitale, recognizing your editor's ignorance, has provided me with additional information concerning the formation and value of the Paterson Museum collections, which I am very pleased to quote.

From the "Memorial of James F. Morton" by O. Ivan Lee in the American Mineralogist, Volume 27, 1942, pages 200-202.

"James F. Morton, Curator of the Paterson Museum since 1925, died at St. Joseph's Hospital in that city early on the morning of October 7th, 1941.

As Curator of the collections under his care, he had expanded them until the Paterson Museum had attained an enviable national reputation. When the International Geological Congress met in Washington in 1933, its members signified their desire to visit three museums possessing mineralogical specimens of special interest to them - the SmithsonianInstitution, the American Museum of Natural History and the Paterson Museum. Three hundred delegates made the pilgrimage and were amazed at the richness and scope of the mineralogical exhibits. A group of specimens from Franklin especially impressed them, while the Paterson minerals, of which Mr. Morton had listed more than 57 species, were deemed of surpassing interest."

From a Museum circular, "Since 1934 the Paterson Museum has been devoting much research to fluorescent minerals; this territory and that of Franklin, N.J. being rich in such extraordinary phenomena. Robert Williams, long a collector of minerals, and the present chairman of the Museum, started the mineral collection there some fifteen years ago with a gift of 1200 different rare items. The late Curator James F. Morton enlarged this collection through contacts with various Paterson quarries and friendly entree to the world famous zinc mines at Franklin, N.J. Many gifts from Patersonians and others of minerals have enlarged the Museum's collection, till it stands among the finest in the world.

In Dake and DeMent's "Fluorescent Light and Its Application", published in 1941, we find the statement: "Probably the largest museum exhibit of fluorescent minerals is that of Paterson City Museum, Paterson, N.J. This museum has specialized in the spectacular Franklin, N.J. specimens and hundreds of the specimens from this locality are included in the exhibit. Thus placing the Paterson Museum in the forefront of the world's museums in this particular."

My thanks to Mr. Vitale for calling this matter to my attention. I fully intend to revisit the Paterson Museum at an early date.

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Visitors to the annual Franklin-Sterling Mineral Exhibit are presented with a souvenir booklet. For a number of years the mineral and geological information in this booklet has been prepared by Jack Baum. His descriptions are always factual and interesting. He truly deserves a commendation for his efforts. I particularly appreciated a single page in the booklet for the 1970 show. Judge for yourself - can anyone give more information in six short paragraphs, or present it as well?

THE ORIGIN OF FRANKLIN-STERLING MINERALS

John L. Baum

The wealth of mineral species found in the Franklin-Sterling area owes its abundance to an assortment of geological events seldom if ever duplicated elsewhere. A billion years ago sand, silt and carbonate were deposited on the bottom of a great sea reaching from New Jersey nearly to Hudson Bay. With these sediments were submarine lavas and accompanying hot springs. In quiet deep spots, iron, zinc and manganese accumulated and were incorporated into the thickening sequence. Over 800 million years ago, depth of burial and folding transformed the rocks and their enclosed cores into the layered materials we see today.

It was during this initial period of mountain building that such locally abundant minerals as franklinite, willemite, tephroite, rhodonite, feldspar, pyroxene, hendricksite, magnetite, and much of the zincite was formed. Following elevation of the new land above the sea, erosion took place until the land was nearly level and the great cover of rock over the Franklin ore was removed. Some of the ore was incorporated into the beach sand that was deposited over the ore some 500 million years ago, and could be seen underground in the fossil beach prior to the closing of the Franklin Mine in 1954.

The new period of rock deposition starting with the beach at Franklin continued as the surface sank in the classic geologic pattern of submergence, deposition, uplift and erosion. Perhaps four periods of mountain building took place during the repetitions of the sequence, each with an opportunity for deep fractures to allow introduction of new liquids and vapors to add and alter the earlier minerals. Volcanoes flourished in the vicinity 400 million years ago, and again 160 million years ago.

It is no wonder that the number of mineral species in the area continued to increase as various elements were added by solutions circulating through the interconnecting fault patterns. The deepest part of the ore at Sterling was invaded successively by magnesium, boron and sulphur giving origin to a host of additional minerals. The magnesium produced dolomite and serpentine, and zinc was released from the serpentinized willemite to recrystallize as zincite, and dissolved willemite formed radiating white willemite in dolomite veins.

For the last 100 million years or more, the Franklin-Sterling area has been undergoing erosion as the high ground of New Jersey was washed down the rivers and the coast to form southern New Jersey and fairly recently, a million to 10,000 years ago, continental glaciation has aided the process exposing the ore bodies for discovery and mining. Meanwhile, minerals continue to form. Until it was dried up by mining, the mud zone at Ogdensburg was growing aragonite crystal clusters, chalcophanite, and other exotic manganese oxides. At present, greenockite, hydrozincite and hemimorphite are forming underground and in the surface dumps.

While the greater part of nature's work in forming Franklin-Sterling minerals has been finished, the story is far from complete. New discoveries are being made and amateur and professional working together are writing the next chapter in Franklin-Sterling mineralogy.

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Franklin Mineral Notes

In the past six months considerable research has been performed on Franklin minerals. Drs. Frondel, Hurlbut and others at Harvard have been active in thie field and so has the N.J. Zinc laboratory at Palmerton, Pa. This work has resulted in a number of additions to our list of validated Franklin-Sterling Hill minerals. However, that list is now being rechecked with Dr. Frondel. A number of questionable species and doubtful occurrences are under investigation. We hope to resolve all questions and provide you with a complete explanation and revised list in the next Picking Table.

Several new minerals have been validated through the joint efforts of Jim Gouger, Jack Baum and the Palmerton laboratory of the New Jersey Zinc Company. The news of these discoveries were announced by Mr. Baum in his talk to the F.O.M.S. on November 22nd, 1970. His report follows:

Annabergite

Annabergite was found by J.B. Gouger, Jr. and X ray identified at the Palmerton laboratory. Not found before at Franklin, annabergite is an alteration of nickel, arsenic minerals, and developed during exposure of specimen material on the Trotter Dump.

Gonyerite

Gonyerite, a manganese chlorite, was found by Mr. and Mrs. Frank Phillips on the Buckwheat Dump and was x-rayed at Palmerton in 1967. In the original specimen, the gonyerite is a dark brown massive mineral containing willemite crystals and veins of a nearly black micaceous mineral of a very fine texture, also new, as indicated by x-way.

Note - Gonyerite was also identified at Harvard by x-ray, specimen HS-90366. Much of this specimen was sonolite mixed with a reddish mica, which proved to be gonyerite, a manganese chlorite.

Gonyerite was discovered by Dr. Frondel in 1955. It is listed in Hey, #14.17.6a as "a manganese chlorite with little or no Al_2O_3.

Pyromorphite-Mimetite

This material was found by Jim Gouger and was variously identified as either pyromorphite or as mimetite. It is found in the pits at Sterling Hill as an alteration of galena and apatite-svabite with a yellow to mustard color. It occurs as earthy masses and as globular coatings on aegerine-augite (jeffersonite).

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Areas at best are a few inches across and not solid areas at that. The difficulty in nomenclature occurs because the Sterling apatite contains arsenic as well as phosphate and the lead from the weathering galena picks up both, forming a combination of the lead arsenate, mimetite, and the lead phosphate, pyromorphite. This is a common situation when we develop intermediate members of a series such as this. Other examples are albite-anorthite, aegerine-augite, diopside-hedenbergite, etc. Dr. Hurlbut says the hyphenated name is acceptable.

Other discoveries

Another specimen collected by Jim Gouger of blue Kittatiny limestone contained a vug with quartz, dolomite and fluorite crystals, all coated with a golden sparkling film. Palmerton x-ray analysis indicated this to be a mixture of the three crystalline minerals and a 10 angstrom tri-octahedral mica, unidentified. Biotite is one member of this type mica.

Another specimen submitted by Jim Gouger from the Sterling Hill pit area contained a white powdery mineral resembling kaolin on epidote and augite. Palmerton x-rays indicate this to be a 10 angstrom, di-octahedral mica with some feldspar.

A montmorillonite-illite clay was found by Jack Baum as a waxy appearing buff coating on weathered ore from the 430 foot level at Sterling Hill. It resembles a paint film in the way it adheres to the irregularities of the porous specimen. Identification was made by Palmerton. Montmorillonite-illite is the common clay in the Mississippi delta and Gulf Coast sediments.

Very little or no study has been made by American scientists of the various clay minerals found at Sterling Hill. It took a Russian scientist to identify zinalsite found at this location.

Margarite and Grimaldite

Minute reddish octahedra of spinel occuring with corundum, margarite, anorthite, rutile and arsenic minerals from the Sterling Hill Mine, 430 level, have been confirmed as grimaldite, a spinel first described from Guyana. This mineral was discovered at Sterling Hill by L.H. Bauer in insoluble residues in 1952 and sent to Harvard for identification. However, the amount provided was insufficient for identity purposes. Jack Baum sent additional material but that was still not enough. Then, several years ago the species was described from Guyana. Now, the material has been identified by Harvard through the electronic probe. The associated anorthite is very pure, uncommon in a member of the plagioclase feldspars where combinations of albite and anorthite are most common."

Note - for additional information concerning this material see the Frondel-Cook report later in this issue.

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At Harvard, Dr. Frondel advises that they have been busy on new analyses of franklinite and gathering new data on the fibrous minerals in slickensided "calcozincite" (which include anthophyllite). An unusual purple silicate submitted by Ewald Gerstmann was found to be scapolite.

Jacobsite

Dr. Frondel's analyses of franklinite show that a number of specimens have a manganese content in excess of iron, which brings these specimens into the jacobsite category. Jacobsite should be added to the validated list of Franklin minerals.

Pyromorphite-mimetite

Additional information on these species was given by Dr. Hurlbut to Ewald Gerstmann, who had sent several specimens to Harvward for analysis. Dr. Hurlbut advised "On two specimens there are small yellow globules; these are the mimetite. X ray photographs give a pattern midway between mimetite and pyromorphite. A spectrographic analysis shows the same thing; that is, about equal amounts of arsenic and phosphorous. A feature more unusual than this is that it contains a considerable amount of calcium, iron and zinc."

Margarite/Grimaldite/Uvarovite

To complete the information available on the analyzed Sterling Hill material containing the above species, here is the scientific report:

Harvard Mineralogical Contribution #468
Margarite from Sterling Hill, N.J.
Clifford Frondel and David Cook

The margarite-corondum-anorthite assemblage was found in 1952 in the Franklin limestone adjacent to the West Shaft of the zinc mine at Sterling Hill, N.J. (cf Figure #1 Metsger, Tennant and Rodda).

The occurrence consists of pale green platy crystals of margarite up to several centimeters in length intergrown with crudely formed crystals of red corundum and white crystals of anorthite. The corundum partly encloses the margarite crystals, and the anorthite envelops both of these minerals. When the calcite matrix is dissolved, tiny crystals of a number of accessory minerals are released. They include arsenopyrite, rutile, sharply formed crystals of graphite, a green garnet, and octahedra of a dark green to brownish black chromium variety of gahnite. A spinel from this occurrence is said to have been determined spectrographically in the laboratories of the New Jersey Zinc Company as $ZnCr_2O_4$ but was not encountered here. A few pseudomorphs of corundum after spinel also were observed.

A chemical analysis of the margarite by Dr. Jun Ito, 1964, gave SiO_2 - 29.70; Al_2O_3 - 49.96; Fe_2O_3 - 0.25; Cr_2O_3 - 0.07; V_2O_5 - 0.10; TiO_2 - 0.25; CaO - 11.68; MgO - 0.12; CuO - 0.53; Li_2O - 0.21; Na_2O - 1.24; K_2O - 0.05; H_2O^+ - 5.60; H_2O^- - 0.23; total 100%. Cl is also present in traces; also spectrographic traces of Ga, Mn, Ba, Si, Y, Yb, Ni, Mo, Ag, Cd, and Sb.

The content of Na, Mg and Fe^3 is lower than is ordinarily found in margarite and there is a noteworthy content of Cr, V, Ti and especially of Cu. Some Li is present, as is usual for this species.

Palache (page 41, 1937) stated that an irregular chain of pockets containing corundum extended in the Franklin limestone from Sterling Hill to Franklin. Unidentified brittle micas have been found at other localities in the Franklin limestone and the type locality for clintonite (seybertite) is in this formation at Amity, N.Y.

Addenda - The margarite, not earlier identified from either Sterling Hill or Franklin, has given rise to the erroneous reports of mariposite and kyanite that appear in some lists of the minerals from these localities.

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Note - the green garnet referred to in the above report has been identified by Dr. Frondel as uvarovite and the chromian spinel as grimaldite. These new minerals should be added to your validated list of Franklin minerals.

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Hydroxyapatite

Still another new species for the validated Franklin list - hydroxyapatite. This is listed in Hey as #19.4.8 with the formula $2[Ca_5(PO_4)_3\ OH]$.

In the last issue of The Picking Table, we presented the story of the finding of Fluor-edenite by Bob Coffee of Rochester, N.Y. In that article we mentioned that an unknown yellow fluorescent mineral found on the Trotter Dump was being analyzed and that it might be Dahllite. The x-ray patterns proved that this new mineral is hydroxyapatite. Bob Coffee again provides us with a complete description of the discovery and verification of this mineral.

"How many more undiscovered fluorescent minerals lie beneath the surface of the drumps at Franklin, N.J.? Already known as the fluorescent capital of the world, it is still grudgingly yielding up new varieties to add to its long list. And now comes word of still another - hydroxyapatite. The story of its discovery is one of complex circumstances and deep curiosity.

In the fall of 1969, E.A. Lord of Lafayette, N.J. knowing that I was trying to fill in the remaining holes of my collection of Franklin fluorescents gave me a specimen of what he thought was scheelite. He had found it the summer of 1968 on the Trotter Dump. True, it gave a yellow response to short wave U.V., but it also gave (unbeknownst to him) a dull orange response to long wave and, therefore, did not seem to correspond to reports of scheelite. But what was it? It did not match any of the other specimens in my collection - and there were not many voids.

The areas of fluorescence (strong yellow-orange by S.W.; dull orange by L.W.) were massive with a concoidal and uneven fracture. The material ranged from a light green to white in color and had a vitreous to subresinous luster. Further, the areas of interest varied from translucent (light green) to opaque (white). It was in a matrix of limestone and quartz with considerable dark mica and phlogopite.

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There was even a bright green fluorescence associated with the yellow orange but the green was emitted by a white powdery coating. There was no phosphorescence.

R.R. Parmenter of the Mineral Section, Rochester Academy of Science, almost immediately diagnosed it as being apatite and volunteered to confirm the identification in his laboratory (Industrial Laboratory) at Eastman Kodak Co. The first reports substantiated his opinion - it was a calcium phosphate and a member of the apatite family. However, the spectrographic analysis showed no manganese and no arsenic. There also appeared to be no fluorine. This eliminated all the known members of the apatite family (fluorapatite, manganapatite, and svabite) reported to be found at Franklin. What next? An x-ray diffraction pattern seemed to correspond with Dahllite, a carbonated calcium phosphate. However, to confirm this identification, Dr. Frondel indicated that a carbonate analysis would be necessary. Before this could be done other events took place.

In the spring of 1970, E.A. Lord presented me with another specimen to eliminate tourmaline from my missing list. This specimen had also been found by Al Lord on the Trotter Dump in the summer of 1968 but in a different area from where he had found the previous sample. This second specimen was in a similar matrix of quartz, limestone and mica with no other fluorescing associations. This time, however, the material of interest was definitely crystalline with short prismatic crystals of a blue green to white color. To some of us it looked more like apatite than tourmaline. Examination and comparison with the U.V. lamp showed responses very similar to that of the Dahllite specimen. In this case a pure crystal was fairly easy to sample and an x-ray diffraction pattern showed not Dahllite but HYDROXY-APATITE. Fortunately, R. R. Parmenter had a known specimen of hydroxyapatite from another locale. Comparing the x-ray diffraction patterns of all three samples showed them to be the one and the same. Both of the unknowns were hydroxyapatite.

The actual analytical work was performed by Miss Kitty Fritz, Industrial Laboratory, Eastman Kodak Company, Rochester, N. Y. with interpretations by R. R. Parmerter.

Samples of both materials are now in the Gerstmann Museum, Franklin, N. J. with additional specimens in the collections of E. A. Lord, R.D. Coffee and R. R. Parmerter."

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Hardystonite

"Refinement of the Crystal Structure of Hardystonite, $Ca_2ZnSi_2O_7$" by S.J. Louisnathan, Zits. Krist., volume 130, 1969, pages 427-437, Mineral Abstracts, volume 21, no. 3, September 1970, page 204.

"The crystal structure of hardystonite from Franklin, N.J. was refined from three dimensional diffractometer data to R = 5.3%. A microprobe analysis gave SiO_2 36.80, Al_2O_3 0.94; Fe_2O_3 0.20, ZnO 25.56, MnO 0.76, CaO 34.61, MgO 0.39, Na_2O 0.39, PbO 0.56 = 100.11, with the formula $Ca_2ZnSi_2O_7$. Space group $P42_1m$ or $P42_1$; a 7.8279, c 50138 Å, D 3.42g/cm^3; Z = 2. The structure consists of covalen (ZnSi O) sheets, adjacent sheets being held together by Ca^{2+}ions with predominantly ionic interlayer bonding. The classification of melilites by Zoltain as "two dimensionally non-terminated single sheet structure of tetrahedra" is more appropriate than the description in terms of isolated Si O sorosilicate groups."

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