THE PICKING TABLE

FRANKLIN OGDENSBURG MINERALOGICAL SOCIETY, INC.

BOX 146

FRANKLIN, NEW JERSEY

VOLUME III JULY 1962 NUMBER 2

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CALENDAR OF EVENTS - 1962

September 15th -	Field Trip - 9:00 A.M. - 12:00 Noon Farber White Limestone Quarry, Cork Hill Road, Franklin, New Jersey.
September 15th -	Meeting - 2:00 P.M. American Legion Hall, Route 23, Franklin, New Jersey. Speaker - John L. Baum, Resident Geologist, New Jersey Zinc Co., Franklin, New Jersey. Topic - A Pictorial Trip through the Sterling Hill Mine.
October 13th and October 14th -	6th Annual Mineral Show sponsored by the Franklin Kiwanis Club, Franklin Armory, Routes 517 and 23, Franklin, New Jersey.
October 20th -	Field Trip - 9:00 A.M. - 12:00 Noon, Old Bethlehem Steel Quarry, McAfee, New Jersey. (on Route 517, alternate, just north of Route 94.)
October 20th -	Meeting - 2:00 P.M. American Legion Hall Route 23, Franklin,New Jersey. Speaker - Brian H. Mason, Curator Gems and Minerals, American Museum of Natural History, New York, N.Y. Topic - Langban, Sweden - A European Franklin.
November 17th -	Meeting - 2:00 P.M., American Legion Hall, Route 23, Franklin, New Jersey. Speaker - Paul F. Kerr, Professor of Geology, Columbia University. Topic - Optical Properties of Minerals.

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F.O.M.S. OFFICERS FOR THE YEAR 1962

President - William Spencer
Vice - President - Neil Wintringham
Secretary-Treasurer - Frank Edwards

Trustees

Mrs. E. Packard Cook — John Durkos
Paul Chorney — Richard Hauck
Edward R. De Roo — Ferd DeP. HasBrouck
Ajax Hull (Alternate)

Editor of the Picking Table - Frank Edwards
Mimeo and Typing - Louise W. Borgstrom

Calendar

Many of our members live some distance from Franklin, where our events are held. For September and October, we have rescheduled our calendar so that field trip and meeting occur on the same date. If such scheduling is popular and results in better attendance, our calendar next year will be scheduled in this manner. Please let us know which you prefer - events on separate days or combined on the same date.

Please refer to our fall schedule, which we believe is most attractive. Arrange to come out and bring your friends.

Elections

As usual, our election of officers and trustees for the year 1963 will be held by mail. Ballots showing nominees designated by the Nominating Committee will be mailed to paid up members on October 1st. On these ballots provision will be made for write-in candidates. But, if you have a personal choice for any office, please write to us now. The Nominating Committee will give every consideration to such nominations.

New Members

New members accepted after September 1st will be given paid-up cards for the year 1963. If any of your friends have hesitated to join because of the time element, please call this provision to their attention. We know they will enjoy our fall events and should join now.

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Financial Report

As of June 30th, our cash balance was $923.57 and paid up membership 277. Members not paid as of that date have been removed from the mailing list.

Franklin Mineral Dumps

In recent years the Borough of Franklin has had a steady source of revenue from the sale of permits to collectors for picking on the Buckwheat Dump. As the number of such permits increases whenever the area is turned over, the Borough Council recently authorized regular bulldozing of the rock piles. In mid June, the first of such actions was taken. Since the Dump will again be dozed for the 6th Annual Mineral Show of the Franklin Kiwanis Club on October 13th and 14th, the next dozing sponsored by the Council will be early Spring, 1963.

The Parker Dump is just about finished for collectors. Last year, the upper area was sold in small parcels to adjacent property owners, who are now using them for their own purposes. Permission to collect in this area is difficult or impossible to obtain. The lower triangle has now been sold for a firehouse location. When a building is erected, all collecting at this Dump will cease.

New Jersey Zinc Company

Operations at the Sterling Hill Mine continue to increase. Two full shifts are now operating and several cars of pulverized ore are leaving daily for the smelters at Palmerton.

Recently the New Jersey Zinc Company announced it will enter the field of petrochemicals and will produce and market anhydrous ammonia as its first product. A new plant, estimated to cost in excess of four million dollars, is to be built at Palmerton, Pa. This project represents the second major step in a diversification program, which was originally started in 1956 with the purchase of a plant producing titanium dioxide. Anhydrous ammonia is a basic industrial chemical used in the production of fertilizers, plastics, paper, textiles, explosives, synthetic fibers and other modern day products.

Meetings and Field Trips

This was a busy Spring. It began on St. Patrick's Day with Dr. Henry Millson, American Cyanamid Company, as our speaker. In a return performance, Dr. Millson again delighted and amazed us with his unusual triple exposures of phosphorescence and luminescence in Franklin minerals.

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In April, Mr. G. F. Halfacre, Vice President, New Jersey Zinc Company, completed our series on the mining and processing of the zinc ores, by describing the smelting procedures at Palmerton, Pa. He explained why different processes were necessary to reduce Sterling Hill ores from the processes used on Franklin ores. This clarified many questions, particularly those of an economic nature. Of special interest was Mr. Halfacre's description of costly new smelting facilities now under construction, which should reduce costs and keep zinc products from Sterling Hill ore competitive in the market.

In May, Dr. Paul E. Desautels, Assistant Curator, Gems and Minerals, U. S. National Museum, described the operations of this division with particular emphasis on Franklin minerals, collectors and collections. I'm sure that, as a result of his talk, many of our members have planned a trip to Washington and the Museum in the near future.

In June, our speaker was Dr. Dale R. Simpson, Lehigh University. Under a grant from the National Science Foundation, Dr. Simpson has been studying the formation and stability of apatite and other calcium phosphate minerals under conditions of high temperatures and pressures. Dr. Simpson described his experiments and preliminary results. Two findings should interest all mineralogists and collectors. First, test results indicate that Whitlockite should be more plentiful than occurrences reported. Second; stable, orthorhombic crystals of $Ca_3(Po_4)_2$ are regularly produced in experiments, which indicates that this mineral should be found naturally but no occurrences have been reported to date. A recheck of apatite specimens may be rewarding.

Our first field trip on April 7th was a memorable occasion. This was a joint venture with the New Jersey Audubon Society and featured talks and movies at the Hardyston School and collecting at the Buckwheat Dump. Despite an all day rain, almost 300 people participated. Our guests were enthusiastic and appreciative, and it was truly a pleasure to introduce them to mineral collecting.

On June 9th, almost 150 members explored and collected at the Noble and Passaic Pits, Sterling Hill. The opportunity to visit this this historic locality was most welcome. It marked the first time that the New Jersey Zinc Company has permitted a non professional group to collect in the area. Our sincere thanks to Messrs. Goodwin, Baum and Metsger for making our visit possible.

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Powellite

In our last issue, we reported a find of Powellite from Franklin. Joe Sabo was kind enough to amplify the details of this discovery in a recent letter, which we are most happy to quote:

"Approximately three years ago, Marshall Humphrey of Fanwood, N.J., (now of California) and I collected at the Buckwheat Dump. I found a scapolite rock containing molybdenite and micro-rutile crystals. Marshall and I divided the loot.

Upon arriving home, Marshall immediately used his U.V. light on all of the minerals he had collected. He called me by phone that evening, asking me whether I had tested my minerals under the lamp. I replied that I had not. He was very excited as he was certain we had found powellite. He came over to my home that same evening and we both looked over my specimens. Sure enough, there was a yellowish fluorescence on the molybdenite. We had to use a 10X glass to see the faint coating.

I selected four of the richest specimens and sent them to Dr. Frondel at Harvard University. A few weeks later I received a reply stating that there was not enough material for testing. We were greatly disappointed as we were sure we would receive a positive answer. This meant we would have to continue to search for more material. I found more molybdenite but no fluorescence showed on any of this new material.

In 1961, I finally hit the jackpot. I found a piece in which the molybdenite has completely altered to powellite, leaving a cast of molybdenite surrounded by powellite. This material is of a grey green color and fluoresces a yellowish color under the short wave lamp.

Living nearby are two good analytical chemists, Dr. Alex Knoll of Westfield and Stanley Schaub of Scotch Plains, N.J., who are also proficient in optical analysis on minerals, especially micro analysis. I contacted Alex and Stanley and agreed to meet at the Knoll residence for the testing. There being no visible metallic molybdenite in the material under the microscope, Alex and Stanley ran three or four different chemical tests and proved molybdenum. I am now satisfied that powellite is a native of Franklin.

I thank Dr. Knoll and Stanley Schaub for their combined efforts and also Mrs. Knoll for her moral support and her good coffee and cake. We should also thank Marshall Humphrey for his enthusiasm and keen observation of the minerals of Franklin."

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The Sterling Hill Mud Zone

One of the more important localities in the Franklin Sterling Hill ore deposit has long been neglected in the literature on this area. Yet today, years after its original exploitation, the mud zone at Sterling Hill still produces new minerals and continues to interest mineralogists and collectors. In June, after our field trip to the open pits, and Mr. Baum's verbal report on new discoveries, I felt that a resume on this location would be of value to our members.

Palache's Professional Paper #180 is still the prime source for historical data. I quote from pages 22 and 23.

"With one notable exception the minerals formed by surface alteration are of minor interest in the Franklin district. This exception is so remarkable that it requires special description. During the seventies (1870-9) the Noble and Passaic mines, open pits in two great bodies of calamine lying in the angle between the two legs of the ore body, were the chief sources of zinc ore mined at Sterling Hill. When mining was begun there that area was a shallow watercourse, and the pits were carried to a depth of more than 40 feet below the original surface. In 1906 the sites of the ore bodies were occupied by two great excavations, having roughly the shape of inverted cones, separated by a wall of barren pegmatite. The bare limestone walls of the ore bodies then remained as they were left by the stripping and were clearly seen to be solution surfaces, probably the result of long continued action by ground water. These exposures have long since been caved in by the later mining at Sterling Hill.

"Mr. O. J. Conley, superintendent of the Noble mine in 1878, kindly went over the ground with the author and described the deposit, of which no contemporary account was published. According to Mr. Conley, the calamine formed a layer 6 to 12 inches thick, lying directly on the limestone. The principal filling of the excavated mass was more or less fragmental, consisting of sand, clay, limestone fragments, and loose and broken crystals of franklinite, willemite, garnet, and the like, all stained by oxides of iron and manganese. Separating this loose material from the calamine layer on the north side of the pit was a layer, as much as 4 inches thick, of greasy black mud, rich in manganese, which was the cause of dangerous slides in the pit. On the south side, in a similar relation to the calamine, were found the deposits of chalcophanite and hydrohetaerolite characteristic of this locality. Excellent specimens of the calamine are preserved in collections, and nearly all those examined showed considerable harsh brown or yellow clay adhering to their lower surfaces. This clay is rich in zinc and has been called vanuxemite.

"The relations of the calamine desposits to the main ore bed, as described by Mr. Conley, fully establish their secondary nature. There is, however, other direct evidence in the presence, in the fragmental material from the pit, of crystals of willemite still retaining their form but wholly covered with needles of calamine stained with manganese and of deeply corroded franklinite crystals enclosed by and embedded in calamine.

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These zinc and manganese ore deposits resulted from the weathering of a part of the outcropping ore body, the products of solution being carried to a lower position, where they replaced the limestone with zinc silicate and hydrous oxides of zinc, iron, and manganese. The reason for describing this deposit at such length, is that it seems to throw some light on the origin of the major deposits, as shown in the next section."

Of special interest is the last sentence. Palache's own theory (Metasomatic-emplacement) of the formation of the Franklin-Sterling Hill ore bodies, was based on this calamine zone. (Page 24.)

"That these ore bodies originated through metasomatic emplacement was first suggested to the writer by the characters of two other deposits of zinc ores having a related origin. The first is a small scale illustration that has the advantage of being situated in the Franklin area - the calamine deposit at Sterling Hill, described on Page 23. There has been accumulated a rich ore deposit made up of parallel layers of calamine, smithsonite, zinciferous clay, and hydrous oxides of iron and manganese, and the layering followed the walls of the cavity in the limestone by whose solution a place for the new ore was formed. The source of this ore was the nearby franklinite-willemite mass, and the new ore was constituted in such fashion that, had it and the surrounding limestone been subjected to a vigorous, deep-seated, high temperature metamorphism, there might well have resulted from its dehydration and recrystallization a new deposit closely analgous to the parent mass."

For the latest information on the Mud Zone, I turned to Mr. John L. Baum, Resident Geologist, New Jersey Zinc Company, who most graciously provided the following:

"The Sterling Mine mud zone interests us because of the unusual specimens it has produced and because minerals are still available in place. Formed primarily from the weathering of ore and its adjacent rocks, the zone accordingly produces oxides or silicates of iron, zinc and manganese, and residual minerals released by solution of their enclosing rocks. Although the zone has been known since 1870, its continuous extent downward to a point just above the 700 foot level was not recognized until studied in recent years by R. W. Metsger, present mine geologist, who had the area tested by drill and analysis on various levels until its shape was determined.

The mud zone has an irregularly oval pattern, and is perhaps most contorted in shape on the surface, where it forms somewhat of a dumbbell in outline, one knob representing the southern or Noble pit of the open cut, and the other the Passaic pit close by. The Noble pit was worked through a tunnel from the east, produced a small amount of calamine, and had a short life from 1860 to 1870. The Passaic pit and mine produced from 1870 to 1896, and was the source of most of the showy calamine. The superintendent was named Marshall, and east of the pit sank a 500 foot shaft which bears his name. The old timers failed to follow the mud zone to any depth, and their penetrations of it underground apparently did not disclose the same type of calamine found at the surface, if indeed they recognized any at all.

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"At the present time there are about six mineral localities associated with the mud zone, four of them on the surface. In the Passaic pit is a remnant of the original mud, the source for much of the chalcophanite and hydrohetaerolite in modern collections. Here were collected the reported todorokite and woodruffite, and here also originated specimens of goethite (limonite) containing 42.7% iron and 0.3% manganese, with virtually no zinc. These, occurring close to sparkling white to clear calamine show how completely the processes of alteration responsible for the mud acted to separate the elements of the original ore.

"Between the Passaic and Noble pits is a smaller pit, almost a cave, in which the contact between the gneissic blackrock and the white marble shows remnants of the noted coarse crystals of jeffersonite pyroxene and feldspar. From here and similar situations close by came king-sized crystals shown in Palache including large garnets, apatites, hornblendes and the like. These were the residual contact minerals, most of them found floating in the mud.

"The Noble pit is less productive, but small jeffersonite crystals are found, and coarse pyroxene masses contain galena and its alteration products. A new discovery is a thin cover of soil containing goethite and chalcophanite on the east slope outside the Noble pit, apparently the downhill migration of material once over the pit.

"Underground, the 500 foot level is noted for its clay-encrusted calamine, which is vastly inferior to the old surface specimens, but attractive nonetheless. The mineral occurs as porous layers on the inclined floor of what may have been an open fissure now clay filled and overlain by a thick sequence of mud apparently produced in place and fairly high in zinc. The original rocks were marble and blackrock which is the gneissic material seen so frequently in quarry walls, and the blackrock is preserved as masses of kaolin.

"On the 430 foot level the mud zone contains areas of relatively unaltered rock, so that a passageway encounters repeated rotten zones, one of them in part open, and on the wall of which a giant franklinite crystal teases the visitor. Here one zone contains weathered ore, the calcite removed and the franklinite and willemite grains cemented in a cindery mass by velvety iron and manganese oxides, mainly chalcophanite. Other zones show where alteration had attached coarse franklinite and tephroite to produce cryptomelane as a dull, black, dense, and very hard mineral, and chalcophanite as a shining, feathery-appearing but fairly compact mass. These have been identified by X-ray at the Zinc Company research facilities, as has a faintly greenish-yellow powdery coating found to be the nontronite variety of chloropal, derived apparently from the alteration of tephroite, which releases manganese and leaves a porous siliceous residue, some of it yet retaining the delicate willemite inclusion pattern characteristic of tephroite.

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"Several other minerals have been observed in the more porous zones, one of them a soft earthy brown mineral for which a good X-ray pattern was obtained but for which no matching pattern was on file. The files are not complete and the experience is frustrating. This may be earthy woodruffite. Other specimens show a soft silver coating, resembling tin-foil, and the similarity is heightened by occasional platy masses of the same mineral standing free in cavities. Additional minerals are certain to be identified before long, and study of the clays making up the mud should be rewarding to the laboratory equipped to do the work. If nontronite went untested although visible in hand specimens, consider the less obvious clay minerals awaiting discovery in our dirty old mud zone.

"Some thought has been given to mining the mud zone at some future date. There are a number of problems. For one thing, to support the roof over the inclined zone, the mud may be worth more right where it is. For another, the gooey mud sticks to everything and certainly can not be dumped from cars, assuming it can be gotten into them. Mining the mud, therefore, may present more problems than a taffy pull in a putty factory. But if the day ever comes that the mud zone is treated with a high pressure water jet, there should be some wonderful mineral specimens."

Minerals reported from the Mud Zone include the following:

Anglesite	Goethite	Smithsonite
Apatite	Hornblende	Spinel
Calamine	Hydrohaeterolite	Tephroite
Chalcophanite	Ilmenite	Todorokite
Corundum	Jeffersonite	Tourmaline
Cryptomelane	Limonite	Wad
Franklinite	Nontronite	Willemite
Galena	Psilomelane	Woodruffite
Garnet	Rutile	

Most recently verified is Nontronite, a variety of Chloropal. For identification help, we list physical properties below.

NONTRONITE - variety of Chloropal (Hey 14.19.25)

A hydrated iron silicate, perhaps with the general formula $Fe_2Si_3O_9.5H_2O$. Belongs to the Montmorillonite family (Clay Group)

Color - pale straw yellow or canary yellow and greenish with an unctuous feel.
Soft and earthy. Specific Gravity 2.50. Infusible.
BB turns black and becomes magnetic.
Gelatinizes with HCL.
Index of refraction 1.59 $\pm$.

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MEMBERSHIP RENEWAL FOR 1963

I would like to renew my membership in the Franklin-Ogdensburg Mineralogical Society for the year 1963. Dues of $2.00 attached.

Name ______________________________

Address ______________________________

____

(Please show exactly as you wish your name and mailing address to appear on our mailing list.)

PROSPECTIVE MEMBERS

I believe the person or persons listed below may be interested in the F.O.M.S. and its activities. Please send them information.

Prospect's name ______________________________

Address ______________________________

____

Recommending Member ______________________________

APPLICATION FOR MEMBERSHIP

I am interested in the Franklin Ogdensburg Mineralogical Society and would like to apply for admission as a member. $2.00 in payment of 1963 dues is attached hereto.

Name ______________________________

Address ______________________________

____

(Please show exactly as you wish your name and mailing address to appear on our mailing list.)

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