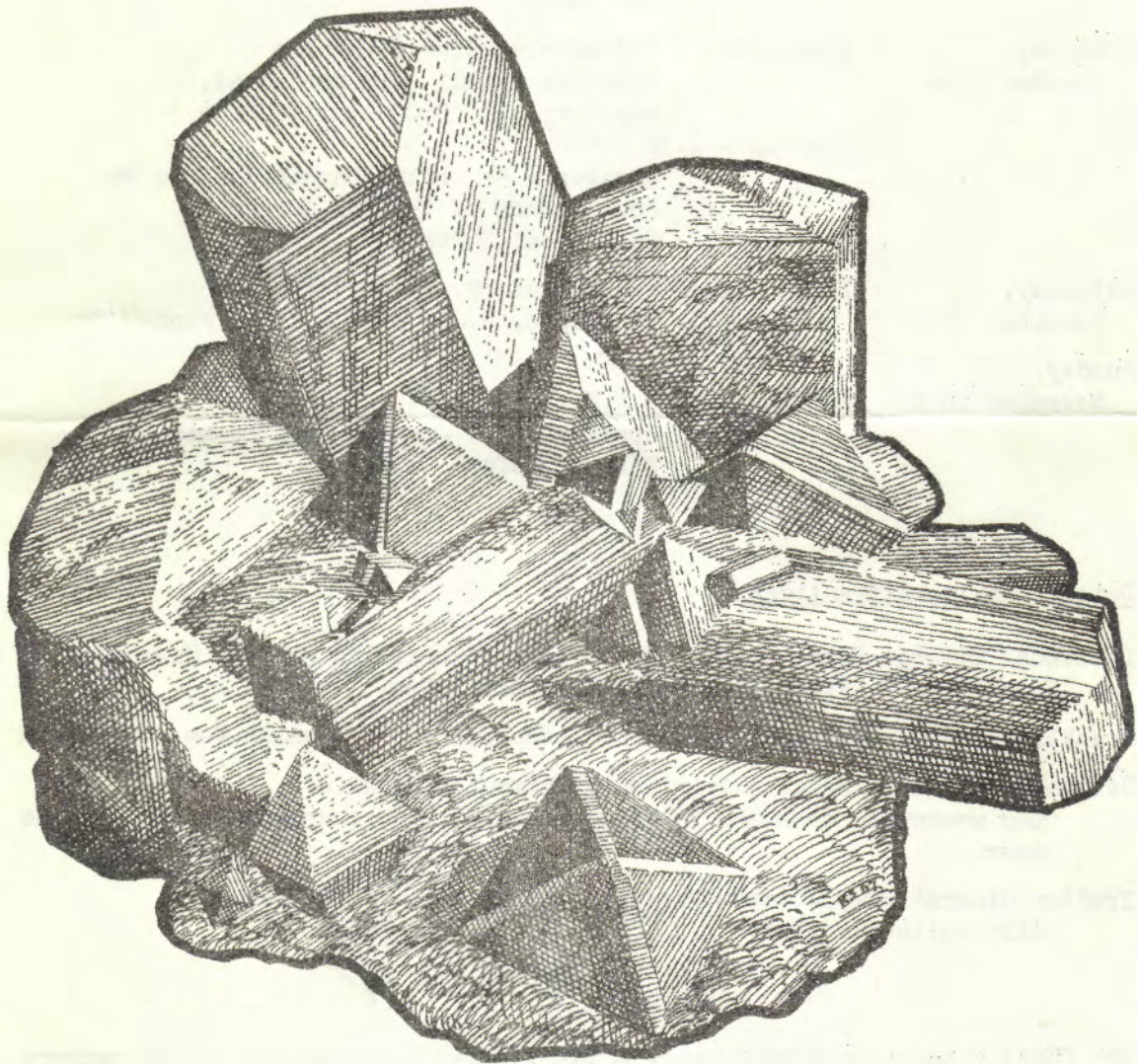


THE PICKING TABLE

JOURNAL OF THE FRANKLIN-OGDENSBURG MINERALOGICAL SOCIETY



VOLUME 14

AUGUST 1973

NUMBER 2

CLUB PROGRAM - FALL 1973

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

Saturday,
September 15th Field trip - Cellate Quarry, Cork Hill Road,
Franklin, N.J. 9:00 A.M. to Noon
Meeting - 2:30 P.M.
Speaker - Mr. Frederick Kraissl, Jr.
re the Paragenesis of the Franklin
Ore Body.

Saturday,
October 20th Field trip - Old Andover Mine (opposite
Aeroflex Field) Limcrest Road,
Andover, N.J. 9:00 A.M. to Noon
Meeting - 2:30 P.M.
Speaker - Mr. Frank Mankiewicz, re the
Recent Work of the New Jersey
Geological Survey

Saturday,
November 17th Field trip - Bodner Quarry, Quarry Road,
Rudeville, N.J. 9:00 A.M. to Noon.

Sunday,
November 18th Meeting - 2:30 P.M.
Speaker - Mr. John L. Baum re his
African Safari

* * * * *

Daily Franklin Attractions

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

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

Gerstman Private Mineral Museum, Walsh Street, Franklin.

Open weekends; on weekdays by arrangement. No charge, courtesy of the
owner.

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

* * * * *

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 1973

President	Henry M. Althoen	319 Third Street, Dunellen, N.J.
1st Vice President	John L. Baum	70 Hamburg Tpke. Hamburg, N.J.
2nd Vice President	Bernard Kozykowski	DeKay Lane, Livingston Manor, N.Y.
Secretary	Wilfred Welsh	67 Lilline Lane, Upper Saddle River, N.J.
Treasurer	Robert Thomas	802 Lindsley Drive, Morristown, N.J.
Asst. Treasurer	Pat Thomas	802 Lindsley Drive, Morristown, N.J.

TRUSTEES

Lee Areson '74	Frank Z. Edwards '74
Bruce Barr '74	Alexander Knoll '73
Louis Benedict, Jr. '74	Frederick Kraissl, Jr. '73
William Clinton '73	John E. Sebastian '73
Alice L. Kraissl '73	

COMMITTEE CHAIRMEN

Auditing	Bernard Kozykowski
Field Trip	John E. Sebastian 36 Roxbury Drive, Kenil, N.J. and Bernard Kozykowski
Field Trip Registration	Trudy Benedict, 412 So. 21st St., Irvington, N.J. and Betty Sebastian
Historical	Frederick Kraissl, Jr., Box 155, No. Hackensack, N.J.
Identification	John L. Baum, 70 Hamburg Tpke, Hamburg, N.J.
Membership	Robert Thomas, 802 Lindsley Drive, Morristown, N.J.
Museum	John L. Baum
Nominating	Alice L. Kraissl, Box 155, No. Hackensack, N.J.
Publicity	P.E. Scovern, New Jersey Herald, Hamburg, N.J.
Program	Frank Z. Edwards, 100 West Shore Trail, Sparta, N.J. and Frederick Kraissl, Jr.
Publications	Frank Z. Edwards
Safety	John E. Sebastian and Bernard Kozykowski
Social	Betsy Althoen and Alice Kraissl
Welcoming	Jenny Areson, 21 Irwin Street, Middletown, N.Y.

F.O.M.S. NOTES

Another Fall program has been prepared for your edification and entertainment. Our speakers, as usual, will be both interesting and informative. Our field trips always produce good material for the active hunter. Are you taking advantage of your opportunity to participate? The members who do so find their efforts are well rewarded. Note our dates on your calendar and try to attend.

A new slate of officers will head the F.O.M.S. for the year 1974. At our October meeting, the Nominating Committee under the chairmanship of Alice Kraissl, must present a proposed list of nominees. If you desire to propose any member as a candidate for office, please communicate your wishes to Mrs. Kraissl as soon as possible. Floor nominations may also be made at the October meeting.

* * * * *

I am very pleased to announce that Mr. David Cook of Harvard University has agreed to become Co-Editor of The Picking Table. With his assistance, we hope to make this Journal even more interesting and useful. Our main objective will still remain the same - to provide our members with accurate up to date information on Franklin-Ogdensburg minerals and mineralogy. Remember that contributions from members for publication in this journal are always welcome.

* * * * *

Several years ago the Limecrest Quarry in Sparta was closed to general collecting because of abuses by careless and thoughtless collectors. Since then collecting has been limited to one field trip per year and the Franklin Ogdensburg Mineralogical Society entrusted by the Limecrest management with supervision of the event (only because of our excellent safety record). This year attendance at the Limecrest field trip broke all records. But, under the unceasing vigilance and able management of John Sebastian and the members of our Safety Committee together with the help of safety personnel from other clubs and the fine cooperation of all the collectors attending, there were no problems. This insures another field trip to Limecrest next year.

An excellent description of this event was sent to me by Mr. Russell M. Wood of Levittown, Pa. His report makes interesting reading:

OPEN HOUSE AT LIMECREST - 1973

The forecast for Sunday, May 20th certainly was not conducive to the prospect of an all day field trip and a drive of 75 to 100 miles each way for many persons. Rain was the general forecast and a North Jersey temperature hovering around 58 to 60 degrees. In spite of the inclement forecast, attendance was amazing -- 539 signed in representing 28 clubs, 3 colleges and 3 museums. Visitors from Florida, California, Indiana, and two from Denmark were eclipsed by a visitor from Japan. One of those from Denmark was president of the local rock club (FORENINGEN AF STENVENNER). It had rained earlier in the morning but brightened up to give everyone a good start and just about when the quarry was crawling with human ants at 11 A.M. - the downpour started and continued off and on lighter or heavier for the rest of the day. Many examples have been seen of the determination (stubbornness?) of rockhounds pursuing their avocation under adverse conditions and this day provided a good example en masse. Your reporter last attended in 1969 on a brilliant and hot day when 439 from 12 clubs participated, so you can imagine how many might have shown up if it was clear and bright. Those of us who had been here before might well have been pleased at least with the overcast and temperature remembering what it was like to be in a 1500 by 600 by 250 foot stone box with the sun bouncing off the glaring white walls.

As in previous years the registration was handled by the distaff members of the Franklin-Ogdensburg Mineralogical Society acting as host club assisted by a few members of other clubs in the annually growing parking problem and directional work. Safety was ably handled by the Ogdensburg Club from a fenced overlook where all parts of the huge terraced quarry were visible. Warnings were by a portable bull horn which could be heard readily deep in the recesses. For the large group surprisingly few had to be warned--general rules called for remaining at least twenty feet away from overhang and quarry walls. The host club wore white hats and armbands and were easily recognized. Quite a large number arrived without hard hats and were turned away to hunt on scrap piles or broken sized material on the top level. The host

club was helping out some of those unfortunates with a case of hard hats they sold for \$4.50 each. Another person was seen selling hard hats also and it was reported they went as high as \$5.00.

One especially helpful service by the host club was a mineral specimen display showing some 16-20 of the minerals more commonly found in the quarry and many--including myself--made good use of the material both on the way in and on the way out. How I forgot to mention the half-mile hike in I do not know, surely it is the single most famous (or infamous?) and distinctive feature of a Limecrest trip. Parking among the crushed and sized piles and quarry buildings, you proceed down terraced ramps for a full half mile to the floor of the quarry, one route is longer and gradual, the other shorter and steeper. Most groups, knowing this, warn members about weak hearts, picking up too much material, bringing a wheeled vehicle for carrying your load. Speaking of the last, I saw more collapsible shopping carts than one would normally see in a half dozen markets, kids' wagons, borrowed luggage carriers, trash can carts, garden dump carts, a baby carriage without a baby, and a large assortment of hand trucks. Most carried their lunches, something to drink, rain gear, cameras, as well as normal rockhounding gear with them--not wanting to face the long trek out just for lunch. The rain thinned the ranks only slightly but by 3 P.M. most were gone as the official hours were 9 to 3. Most people collected along the sides as they ambled down the ramps, I was halfway down with a good deal of material before I realized it. Most collected along the way leaving as well as entering. Everyone was keeping an eye out for corundum and the rain helped some find sapphire--one boulder found was loaded with blue eyes. Embedded sphene was also found by a number as well as plenty of interesting pyrrhotite, spinel in limestone, tremolite crystals, edenite variety of hornblende, pyroxene crystals, plenty of graphite, interesting norbergite from tiny to 1/4" embedments some of which when I got home fluoresced a faint to bright cream color, plenty of phlogopite, muscovite, biotite, a nice vein of purple fluorite, rhodonite, tourmaline, pyrite, ruby corundum, actinolite, augite, chlorite, garnet, hornblende, scapolite, vermiculite and magnetite.

As this quarry since 1966 is open only one day a year it is always an interesting trip, if not for specimens entirely, then to enjoy the widening fraternity of rockhounds whose kindred interests direct their attention and cars to this locality on that day. Our thanks to Plant Manager, Mr. C. Burnett Freas.

Russell M. Wood.

* * * * *

Franklin Mineral Show

The 17th Annual Franklin-Sterling Mineral Exhibit sponsored by the Kiwanis Club of Franklin will be held on Saturday, October 13th and Sunday, October 14th, 1973. Hours on Saturday -9 A.M. to 8 P.M.; Sunday, 10 A.M. to 6 P.M.

The admission price of \$1.50 per adult - \$1.00 for children provides admission to the Franklin Armory with exhibits and dealer section; to the Franklin Mineral Museum including the Mine Replica and famous Fluorescent Display; and to the Buckwheat Dump for specimen collecting. A shuttle bus will provide quick transportation to all areas; free parking also will be provided.

* *

-3-

Franklin Mineral Show, Cont.

This year one of the dealer booths will be again manned by members selling Franklin mineral specimens only. You may be able to fill some of the holes in your collection with purchases here.

* * * * *

On the first of the year Mr. William Williams became the Manager of the Sterling Mine of the New Jersey Zinc Company. Prior to this appointment, Mr. Williams was the Superintendent at the Friedensville, Pa. mine for about four years.

* * * * *

With great pride we announce that former President Alice L. Kraissl won the American Trophy (the top prize) with her Franklin/Ogdensburg micromount exhibit at the annual show of the American Federation of Mineral Societies at Charlotte, N.C. Mrs. Kraissl entered competition three years ago with an entry in the Novice class at the Eastern Federation Show held in Lake Placid. She won a blue ribbon then and all her entries in competition since have done likewise. These are testimony to the extreme care and thorough preparation of her exhibits. Recently, I asked Alice for an article on the preparation of competitive exhibits. She complied with my request and we give you her article on the subject. It is of interest to all collectors for the basic principles cited hold true for every exhibit, including your own cabinet.

COMPETITIVE EXHIBITING

Alice L. Kraissl

Believing there are members who might be interested in the competitive exhibition of minerals, your Editor requested an article on this subject.

The first requirement for entering competition is membership in a society which belongs to The Eastern Federation of Mineralogical and Lapidary Societies (or one of the other regional Federations).

The next requisite is to obtain a copy of the Exhibitor's Manual and of the Uniform Rules. If your club does not have a supply on hand, the Secretary can always obtain them for you from your regional Federation.

The next step is to read these booklets. I've heard people say they can't understand the Uniform Rules and that they are confusing. I believe this is the result of a general tendency to merely thumb through the booklet and to concentrate only on the exhibit class in which the reader is interested. We prefer to start right on Page 1 and read the entire booklet through; and only then concentrate on the areas of interest. If this procedure is adopted, I feel sure that the provisions and restrictions of the Uniform Rules will be found logical and understandable.

Also included in the Uniform Rules booklet is a list of accepted reference books. The new Mineral Glossary is now an accepted reference, and, as it is arranged alphabetically, is very easy to use. With these reference books you can prepare and check your labels, a step which is extremely important. Material or specimens not included in any of these accepted reference books are not acceptable for competitive exhibition.

Having read the Uniform Rules and familiarized yourself with the various classes of exhibits, it is time to choose the class for which your material is best suited, and also the grade in which you wish to exhibit, either Novice, Advanced, or Master. You will learn from the Rules that Novice requires a score of 70 or over, Advanced requires 80 or over, and Master 90 or more, for a first place blue ribbon. Your score, no matter how high, will be accepted only for the grade you have entered. After a first place has been earned in either Novice or Advanced your exhibit may be reentered in the next higher grade. After a Master first place has been earned, the exhibit may be entered for the American Federation Trophy in that class. It is not required that an exhibitor start at the foot of the ladder. If you have fine material and lots of self confidence, you may start by entering in the Advanced grade.

The next step is to look at your specimens that may qualify for the class chosen. Recheck the Rules to be absolutely sure of size limitations and the number of specimens required. Spread your specimens out and look them over with an extremely critical eye for freedom from flaws and start a process of elimination by taking into careful consideration the point values for the selected class. For instance, if you have decided to exhibit miniatures, you will find that you must not show less than 25 nor more than 35 specimens; each of which must fit into a 2" cube; and that no more than 5 may be so small as to qualify for the thumbnail class. You will further note that point scores are Quality 65, Showmanship 20, Labeling 10, Rarity 5. Obviously you can lose most points in quality; therefore you must take care to exhibit only the best specimens you have. If you own a very rare mineral, but it is of poor quality, you will lose more points for this fault than you can gain for rarity. A display of such a specimen would be a poor choice. Also, familiarize yourself with the rules regarding duplication of specimens. Except in a few specified cases duplicates are not permitted. Inclusion of duplicates will result in deductions from your score.

Showmanship is awarded the next highest number of points (20). Again it is suggested that you reread carefully the Exhibitor's Manual which is most helpful on this subject. A neat, uncluttered exhibit, an unobtrusive color background, free of wrinkles or lumps, is pleasing and recommended. The size and format of labels also counts under showmanship. Be sure your labels are legible; that they will not curl under heat; and that the size harmonizes with your specimens. Be sure that your minerals are sparkling clean and place each specimen to show its best features to the greatest advantage. Finally, before you close your case, recheck carefully for any dust or lint that would detract from the appearance of your exhibit. The most desirable arrangement of an exhibit is rarely achieved on the first try. It is a good idea to set up your exhibit in a location where you can "live" with it for a couple of weeks. Most likely you will find yourself making many changes before you are finally satisfied that you have arrived at the best.

The 10 points allowed for labeling may not seem like many. However, each error in spelling or in the chemical formula is a deduction of 2 points; five errors means zero for labels. Labeling errors are the result of carelessness. So check your reference books and proof read each label at least twice before you are satisfied your labels are absolutely correct. Also check the spelling of the geographical place of origin. This, too, must be accurate and some of

of the names, particularly foreign ones, are quite unusual. The Exhibitor's Manual has considerable information on labeling procedures and should be studied. Note that family names such as garnet, mica, feldspar, must NOT be used on labels.

The 5 points allotted for rarity are based on the world wide availability of the mineral on display. Perfect quartz crystals from Franklin, N.J. are rare, but compared to other locations they are a poor choice. However, the minerals found only at Franklin are highly desirable, particularly specimens of good quality.

Ten years ago I felt that I would never exhibit in competition - that it was too much trouble and a waste of time and effort, etc. Now I know how short-sighted such an attitude can be. The true reward of competition is not the blue ribbon or trophy but the new friends made among fellow exhibitors; the increase in knowledge that comes from the close and critical study of your collection, and greater discrimination in the acquisition of new specimens. We all intend some time or other to really study our collections. Having a definite schedule to meet for a show insures that we do take time to really study our material. In so doing, we are the beneficiaries.

My own interest in exhibiting has been the micromounts of Franklin minerals. When I look back to my first exhibit and compare it with the current one now in preparation for the next EFMLS show, I KNOW that the statements made above are true and I urge others to join in this enlightening opportunity.

* * * * *

MINERAL NOTES

Recently Validated

Legrandite $\overline{Zn}_{14}(AsO_4)_9 \cdot OH \cdot 12 H_2O}$ Dana 42.7.1 Hey 20.3.2

Legrandite, a hydrated basic zinc arsenate, was identified on a Sterling Hill specimen by Dr. Warren Miller and David Cook. The specimen from the arsenate area is in the collection of Ewald Gerstmann. The original find is on the crusted surface of a diamond shaped piece, about 3" to a side by 2" high. The matrix is ore of black willemite, franklinite, calcite with some sphalerite. The legrandite occurs in about 12 crystallized areas, averaging 1/2" in diameter, of yellow crystals or needles. Other arsenates also occur in the crust.

Pharmacolite $4\overline{Ca}HASO_4 \cdot 2H_2O$ Dana 39.2.1.2 Hey 20.2.4

In the February 1973 issue of The Picking Table on page 8, descriptions of specimens from the arsenate area were given. Under pharmacosiderite it was mentioned that "very small yellow balls of what has been tentatively identified as pharmacolite by chemical and optical means". Identification is now definite and pharmacolite may be added to the verified list. Pharmacolite is a hydrated acid arsenate of calcium. It has been found in other areas in the oxidized parts of arsenical ores together with other arsenates.

Tenorite 4 $\sqrt{\text{Cu } 0}$ Dana 423 Hey 7.3.3

Just verified at Harvard by David Cook is a copper oxide new for Franklin/Ogdensburg on a specimen supplied by Jack Baum. I have been unable to see the specimen up to this time and description will have to wait until the next issue of The Picking Table. Also to be clarified is another question. Dana 7th describes tenorite as a crystalline species and calls the massive material the variety melaconite. On the other hand, Hey says the species is melaconite and the variety is tenorite. More later on the subject.

Others

David Cook has verified Kentrolite on Franklin material. He also has a micromount of this species in his collection. Remove the question mark from kentrolite on your list.

Still not verified are the arsenates - arseniosiderite, scorodite and pitticite, all tentatively identified on material from the arsenate area. So far, insufficient material has been found of the first two named to be used for x ray analysis. But, analysis is under way of the mineral originally believed to be pitticite - it now appears that this may prove to be a new arsenic chlorite.

* * * * *

The Arsenate Area

In July, 1972, a mining crew, working on Stope #960, about 20 ft. below the 340 ft. level in the Sterling Mine, set off a blast. After the smoke had cleared and the ore was being removed, a keen eyed miner noted a piece of ore with an unusual coating. Three pieces of this type were found and brought to the surface. Later, examination of the blast area showed that the pieces came from a slip surface, about 4' x 6', which had been exposed by the blast. This narrow slip, averaging only 1/4" in width, runs transversely upward across the ore. As work continued on the stope, this slip was again uncovered and a few additional specimens recovered. Now, identification of the minerals on these specimens shows that this slip surface is the source of another unusual mineralized area or zone in the natural crucible that is Sterling Hill.

This is an arsenate area. To date, definitely identified from this area are the arsenates - symplectite, kottigite, pharmoc siderite, legrandite, adamite and pharmacolite; tentatively identified are scorodite, arseniosiderite and a new arsenic chlorite.

The most interesting are the rosettes of colorless, blue or gray, 1" to 2" long crystals of symplectite and kottigite (often found admixed). Both of these species are rare arsenates that have been found elsewhere only in micro crystals. The Sterling Hill specimens are thus quite spectacular. It is conjectured, that if these crystals had room to form in an open area instead of the narrow slip surface, that they would compare most favorably with the fine large Mexican legrandites.

The Arsenate Area - Cont.

An equally interesting specimen contains a number of colorless and blue symplectite and kottigitite crystals strewn helter skelter over the surface of a 2" x 4" piece. While the crystals are smaller, 1/2" to 3/4" long, they are very well formed and doubly terminated.

A reexamination of the matrix shows ore of mostly franklinite, willemite and calcite with some bustamite and sphalerite and some small grains of arsenopyrite and/or lollingite. However, for genesis, the most interesting piece I have seen has a reddish coating of unidentified arsenates, the rest of the piece is a mixture of calcite, franklinite and a very large amount of arsenopyrite. Under the slip surface, the arsenopyrite has been heavily etched and eroded. Pending further investigation, it would appear that the arsenates result from the leaching of arsenopyrite by surface waters or solutions.

It is also interesting to note that this arsenate area is only a few feet away from the copper alteration zone, which, in turn, is adjacent to the Mud Zone. (See The Picking Table of July 1962 and August 1966 for descriptions.) Both of these areas have produced a goodly number of alteration minerals as a result of the action of surface water or solutions upon the original minerals.

Stope 960 has been most interesting mineralogically. I understand that stope 920, which is above 960, is even more fractured. It also has greater exposure to surface water. The arsenate, copper alteration and Mud zones, all continue upward into stope 920. Hopefully it may prove to be even more interesting than 960 when it is mined.

* * * * *

Recent Sterling Mine Specimens

In addition to the material from the arsenate area some other interesting specimens have come up from the Sterling Mine in recent months. In the Gerstmann collection is a piece from the Copper alteration zone (again stope 960) about 3"x2"x1-1/2" which consists almost entirely of radiating white to light green balls or clusters (which seemed to resemble Paterson prehnite) on remnants of corroded franklinite. A check by Dr. Miller proved that the material was Prehnite, the first find in this area of the common type of this zeolite. Franklin prehnite occurs as minute scales on Parker Shaft material.

Another specimen in the Gerstmann collection came up three months ago from the upper levels in the Sterling Mine. The piece is about 18" x 12" x 12", a matrix of calcite and franklinite. The greatest portion of the piece consists of five very large crystals of gray willemite. The biggest crystal is about 7" on edge, the others average 4" on edge.

In the February 1972 issue of The Picking Table on page 8 a description was given of the first hodgkinsonites identified from Sterling Hill. This material was very unusual in that it did not resemble Franklin hodgkinsonite in any way.

Cont. from P. 8

Ewald Gerstmann now has several pieces from Sterling Hill, from an unknown location, which are more familiar looking. This Hodgkinsonite has been confirmed by John White at the Smithsonian. Again, as a surface deposit; matrix is brown willemite, franlinite, calcite ore. The seam surface is covered about equally by rosettes of recrystallized orange zincite crystals, and by crystallized druses of clear to light pink hodgkinsonite, reasonably resembling Franklin hodgkinsonite.

Another piece in the Gerstmann collection, again from an unknown location in the Sterling Mine, has a surface coated with rosettes of yellow orange zincite crystals and with shiny micro needles of black resembling tiny stibnite crystals. There is insufficient material for analysis; after several "educated" guesses, Ewald has tentatively labeled the crystals "haeterolite".

And back to the arsenate specimens. A clear white crystallized mineral in an arsenate crust has been identified as adamite. Another interesting piece has as the final deposition on the arsenate crust of a dozen 1/16" long, doubly terminated crystals of quartz which appear smoky in normal light but are very yellow under a microscope light.

* * * * *

Additional Mineral Data

David Cook's talk to the Society on May 19th was illustrated with slides of micromounts from his collection. Some of these have previously been described in The Picking Table. Others, not seen before, deserve special mention.

An aragonite specimen from Franklin - the micro crystals in the form of sheaves on a leucophoenicite matrix were not only attractive but were also interesting because of their red fluorescence short wave, unusual for Franklin.

Chabazite crystals, very rare for Franklin. Likewise a chloanthite crystal and manganite crystals.

The ruby red descloizite needle crystals from Franklin were described as unique, the only one of that type from any location.

The chalcopyrite crystals shown are the only ones known from Franklin. Other rarities were spear shaped purple datolite crystals; and kentrolite crystals from Franklin. Sterling Hill rarities were siderite crystals, serpierite crystals (only recently verified); and a lovely Magnesium chlorophoenicite.

Very unusual were chlorophoenicites as sturdy crystals in a vug, greatly resembling striated willemites, instead of the normal needlelike crystals.

Equally unusual were elongated micro crystals of ganophyllite of a type not seen before. A "gageite" specimen was analyzed by David Cook. The surface consisted of jackstraw clusters of dark brown acicular micro crystals growing out of a massive mineral which looked like a dull or dusty tan friedelite. Analysis showed that both the crystals and the massive were both ganophyllite, unlike the previous types of this species found at Franklin/Ogdensburg.

* * * * *

(Marine) Zinc/Iron Oxide

Three papers for those interested in the Geochemistry of Franklin/Sterling Hill.

"Distribution of zinc in North Atlantic deep-sea sediments" by D. Bruty, R. Chester, L.G. Royle, and H. Elderfield - Nature, volume 237, 1972, pages 86-87. Min. Abst. volume 24, number 2, June 1973, page 160. Abstract follows:

"Zinc concentrations in the top portions of 35 North Atlantic deep sea cores are between 12 and 284 p.p.m. Highest Zn concentrations are found in mid-ocean areas."

* * * * *

"The Nature of the Iron Oxide Phase of Marine Manganese Nodules" by G.P. Glasby. New Zealand Journal of Science, volume 15, 1972, pages 232-239. Min. Abst., volume 24, number 2, June 1973, page 161. Abstract as follows:

"The iron oxide phase of marine manganese nodules remains poorly defined, but a colloidal origin is indicated. Mossbauer spectroscopy shows that the iron is present wholly in the ferric state either as a mixture of α and γ -FeOOH or as another combination of ferric compounds such as a mixed oxide of iron and manganese. The mean particle diameter of the iron oxide phase is calculated to be around 10 nanomicros."

* * * * *

"Manganese and Zinc in amphibolites near the Sterling Hill and Franklin Mines, New Jersey." Paper by L. G. Collins in Economic Geology, volume 66, 1971, pages 348-350. Min. Abst., volume 24, number 2, June 1973, page 162. Abstract as follows:

"Amphibolites adjacent to these deposits apparently are not the source of the Mn and Zn because the rocks have not been sheared and recrystallized. This, however, does not rule out other amphibolites as source rocks in the area."

In an earlier paper, Mr. Collins studied the "Regional Recrystallization and the formation of magnetite concentrations, Dover magnetite district, New Jersey." See Economic Geology, volume 64, 1969, pages 17-33 or Min. Abst., volume 24, number 2, June 1973, page 133. Abstract:

"Regional recrystallization of amphibolites and gneisses during deformation has created granites, magnetite concentrations and skarns in response to pressure gradients."

* * * * *

Melanterite/Rozenite

Recent studies by Canadian and Iowa State mineralogists on melanterite and other sulphates suggest that all melanterite specimens be reexamined. Abstract follows of the paper "Halotrichite, Szomolnokite, and Rozenite from Dolliver State Park, Iowa" by Robert D. Cody and Donald L. Biggs published in the Canadian Mineralogist, volume 11, part 5, 1973, pages 958-970.

"Abundant sulphate efflorescences on Pennsylvania sandstones of Dolliver State Park have previous been considered to consist of melanterite. X ray diffraction, infra red absorption, and differential thermal, thermogravimetric, and chemical analyses have now shown that they consist of halotrichite, szomolnokite, and rozenite. (Cont.)

*

Melanterite/Rozenite (Cont.)

Melanterite may occur in place of the lower hydrate, rozenite, during times of high humidity." Also "recent studies of melanterite have shown that it rapidly dehydrates into rozenite."

* * * * *

Allen W. Pinger was the Chief Geologist of the New Jersey Zinc Company for many years until his retirement in 1954. One of his major achievements was the complete geological mapping of the Franklin and Sterling Mines. He was a keen observer and a conscientious recorder of geological data. His opinions were highly respected by management and his colleagues. In June 1961, Mr. Pinger was the leadoff speaker at our F.O.M.S. Symposium. Recently I reread a copy of the paper he presented at that time. Since it contains much valuable information, we felt that it should be printed for our members. The first installment follows; the second and final portion will appear in the next issue of The Picking Table.

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

Allen W. Pinger

In 1774, this part of the area was known as Sharp's Borough, named for Sharp's Forge in Hardyston Township. An unconfirmed story relates that Benjamin Franklin was interested in a company that manufactured Franklin stoves at "Franklin Furnace on the Walkill" during the 1770's.

Ogdensburg was named for Ogden's Forge, which operated at that locality from prior to 1770, until 1805.

In this review, the Franklin locality will be referred to frequently as "Mine Hill," from the Mine Hill Farm Tract, first mentioned in a deed, in 1750. "Sterling Hill," the Ogdensburg locality, was named for Lord Stirling, who held title to the property with his father from about 1740, until the end of the Revolution.

We are situated here at the border of the Highlands and the Great Valley about 50 miles northwest of New York City. The zinc ores are found in the White limestone, and the iron ores are in both the White limestone and in the bordering Gneisses, of pre-Cambrian age. The iron ore deposits are generally lenticular; magnetite predominates, with local hematite, and occasional limonite. The zinc ore bodies are asymmetric U-shaped trough-like masses plunging to the northeast. The ore outcropping of Mine Hill is 2,500 feet long, with a total length of nearly 5,000 feet, extending to a depth of 1,150 feet. The Sterling Hill outcropping is 1700 feet long, with a total length of 2600 feet, extending to a depth of 2,500 feet. The zinc ores contain the unusual minerals franklinite, willemite, and zincite.

The area of interest extends from near Andover, on the southeast, for a distance of about 25 miles, to Pine Island, New York.

As a measure of the economic importance of the area, it is estimated that the iron ores have produced between 500,000 tons of zinc (partly as oxide) and about 5,000,000 tons of spiegel (iron-manganese). (These figures are from publications of the New Jersey Geological Survey, and of the U.S. Bureau of Mines.)

Upon the advent of the first European settlers, the area was sparsely inhabited by the Lenni Lenape, roving hunters having few villages. Artifacts found suggest that their use of minerals was small; flint, jasper, slate and quartz for arrow points, spear heads, and knives; granite, trap and gneiss for tomahawks; clay for pottery; crystalline limestone and specular hematite for ornaments; and iron ore for war-paint. Foreign materials found include soapstone pots, obsidian arrow points, and a single copper ornament has been reported.

A few years after the founding of New Amsterdam, in 1624, the Dutch Governor sent scouts to search for valuable minerals. About 1640, these miners reached the Walkill valley, and old prospect holes at Sterling Hill are ascribed to them. These workings were on the "red-oxide" vein, and were probably opened in the mistaken belief that the red oxide was an ore of copper. The prospectors settled near the present site of Port Jervis, and worked the copper mines in Pahaquarry township, hauling the ore over the "old mine road" to Esopus, now Kingston, on the Hudson River.

In 1664, Nova Caesarea, comprising the lands between the Hudson and Delaware Rivers, was granted by Charles II to the Duke of York. In 1676, the "East Province of Jersey" was sold to George Carteret; and four years later was acquired by the 24 men who formed the "East Jersey Proprietors," still in existence, and where-in all land titles in northern New Jersey originate.

In 1730, a deed from the Anthony Rutgers Estate mentions the "Copper Tract" which was sold about 10 years later to James Stirling, father of William, Earl of Stirling. This deed refers to old mine holes.

Between 1747-'57, reports of the Governor of New Jersey mention charcoal iron forges in the upper Walkill valley. In 1750, a deed from the Anthony Sharp Estate mentions the "Mine Hill Farm Tract;" this designation persists to the present time; the tract contains a large part of the Franklin mine.

Sussex County was organized in 1753; and the period from 1750 to the close of the Revolution, in 1780, saw the development and operation of many of the iron ore deposits of northern New Jersey. Andover Furnace was built in 1763; Ogden's, Sharp's, and other forges were in operation in the Walkill valley. Sharp's Forge was sold at Sheriff's sale, in 1774; and presumably "Franklin's Furnace" was built about this time. In 1761, Lord Stirling inherited the Sterling Hill property from his father. He became president of the East Jersey Proprietors, and was active in the development of the iron industry. In 1770, he attempted unsuccessfully to smelt ore from Sterling Hill at his iron furnace at Charlotte's Borough, and in 1772 or '74, shipped several tons of red oxide ore to England, presumably as copper ore. Specimens of this shipment found their way into mineral collections abroad, and caused confusion as to erroneously reported zincite localities for more than a century.

The first iron produced was used locally; but later it was hauled by wagon to Port Morris on the Morris Canal, about 20 miles from Franklin. About 1830 the new Morris and Essex Canal, an enlargement of the old canal, built a dam forming the

Lake Hopatcong, a large reservoir on the natural divide, affording an adequate supply of water to operate locks to both east and west. A barge dock at Woodport, at the north end of the lake, reduced the wagon haul to a distance of about twelve miles from Franklin. All ore travelled this route, until 1870, when the railroad first reached Franklin.

In 1810, Dr. Samuel Fowler and John Ford acquired a large property from Edward Sharp, including the Mine Hill Farm. In 1816-'17, Dr. Sam bought John Ford's interest. About this same time he married Rebecca Ogden, which brought the Sterling property to his control.

Dr. Sam appreciated the possibilities of the properties, and did much to arouse interest in the investigation and development of the deposits. In 1812, a small amount of zinc was made from the red oxide, and used for making brass; the cost was high, and the project discontinued. In 1830, Dr. Sam succeeded in making enough zinc oxide to paint his house. Dr. Sam served in Congress two terms, during which an Act was passed authorizing Weights and Measures. In 1838, the brass for these standards was made from zinc from red oxide ore, and copper from Perkiomen mines, near Philadelphia.

In 1836, Dr. Sam sold 3300 acres in fee, and "Also all the zinc, iron, and other ores, on or within any land of said Samuel Fowler....in Sussex County. He died in 1844, and soon after, his son Col. Samuel Fowler re-acquired all of the mineral titles formerly held by his father. Col. Sam was a promoter, and in the short period from 1847 to 1850, he sub-divided and sold mineral rights to a number of different companies in such a way as to involve the properties in litigation that lasted with only brief respite from 1857 to 1896. Rights sold separately included surface, iron ore, franklinite ore, zinc ore, and limestone. An incomplete listing shows 28 different companies and individuals involved during the next few decades.

The litigation concerned mainly the definition of "zinc ore" and "franklinite ore". The first concept was that the two ores could be mined separately; this proved to be wrong, and the first settlements were made on the principle that when zinc predominated, the ore was zinc ore; when franklinite predominated, the ore was franklinite ore. After almost countless decisions, appeals, reversals, and countersuits, the only sound and lasting settlement possible was made out of court by the consolidation of all interests into the New Jersey Zinc Co., early in 1897.

In 1840, no one had yet been able to exploit the ores commercially. In 1842, S.T. Jones received a patent on "an improvement in the manufacture of zinc oxide," and by 1848, a group of Companies operating together as the "New Jersey Company", were producing zinc oxide successfully at a plant in Newark. These companies were formally organized as the New Jersey Zinc Co. in 1852. Further improvements in the process were made, and rights to use it were sold to the Passaic Zinc Co., and to the Lehigh Zinc Company.

In 1852, the Franklinite Mining Co. built a plant at Franklin to make zinc oxide and Spiegel; this attempt failed, and was succeeded by the New Jersey Franklinite Co. which accomplished the successful production of oxide and spiegel in 1854. This success, which assured the value of the Franklinite ores, as well as the zinc ores, started the long litigation, beginning in 1857.

Between 1860 and '65, the New Jersey Zinc Co. produced small amounts of spelter, - zinc metal, from "refuse oxide", not suitable for pigment. In 1866, the Passaic Zinc Co. made the first successful production of spelter from ore; and by 1869, had a spelter furnace in operation at Jersey City. In 1870, the American Process of making zinc from ore was in use at Newark, Jersey City, Bethlehem, Pa., and Mineral Point, Wis. The Sussex Railway, now the D.L.& W., was completed - now abandoned - to Franklin; and within the next two years the New Jersey Midland R.R. was completed from Franklin to Jersey City. The latter is now a part of the Erie System.

In 1870-'75, the Marshall and Noble Pits, at Sterling Hill, were worked for calamine ore, and produced many museum specimens, as well as an excellent ore for spelter.

In 1874, the Franklin Iron Co. completed a new furnace at Franklin Pond; it operated at intervals until finally shut down and dismantled in 1906. The ore came partly from the magnetite vein at Franklin, and partly from the Ogden Mines east of Ogdensburg, and partly from other mines in the vicinity.

In 1877-'78, the Trotter mine at Mine Hill was opened, the ore being sold to the Lehigh Zinc Co., in Bethlehem.

In 1880, the New Jersey Zinc Co. settled litigation with Moses Taylor, by reorganization as the New Jersey Zinc & Iron Co. The Lehigh Zinc Company became the Lehigh Zinc and Iron Co., and the Passaic Zinc Mining and Manufacturing Co. became the Passaic Zinc Co. (This last, in 1870.)

In 1886, the Lehigh Zinc and Iron Co. contracted to buy 1000 T per month of ore from the New Jersey Zinc and Iron Co., for seven years; the latter Company to make only zinc oxide.

In 1887, R. W. Parker leased the Rutherford Farm, adjacent to Mine Hill; and sold this lease to the Lehigh Company the following year; the latter company drilled eight drill holes, proving the northerly extension of the Franklin ore body. J. P. Wetherill, of the Lehigh Company, began tests on the magnetic separation of franklinite; this was first suggested by H. D. Rogers, in 1840; and attempted unsuccessfully by S. Wetherill, in 1851.

In 1889, the Ogden mines were acquired by the New Jersey & Penn'a Exploration and Mining Co. Thos. A. Edison designed a magnetic Separator, and experiments and operation continued until 1901; 10,000 T of concentrates were produced in 1900, which contained 62.8% Fe, but the ore was too low grade, and costs were too high for the operation to be successful.

In 1890, the Friedensville mines, in Pennsylvania, shut down; and the Lehigh Company was dependent on Franklin for its ore supply.

In 1891, the Lehigh Co. began sinking the Parker Shaft; at a depth of 580 feet the shaft was flooded, and it was 14 months before it was recovered and a pumping station installed. The shaft was completed to a depth of 950 feet, in 1893. During the next three years the Parker mine was developed, and in 1896, the new No. 1 Mill started operation, continuing until 1911, when replaced by No. 2 Mill at the Palmer Shaft.

The magnetic separation of the ore, with production of a low silica franklinite concentrate, suitable for making of zinc oxide, and spiegel from the oxide furnace residue; and a low iron willemite concentrate, suitable for making spelter; was the final key to unlock the full potential of these unusual deposits. Col. Sam Fowler separated the mineral titles; but it took the Wetherill-Rowland magnetic separator to separate the minerals.

The long litigation was settled by agreement to consolidate the Lehigh Zinc & Iron Co., the New Jersey Zinc & Iron Co., the Passaic Zinc Co., and all subsidiary companies into the New Jersey Zinc Company; accomplished early in 1897, with S.S. Palmer as President, W.P. Hardenbergh as vice president, and C.A. Heckscher as General Manager. The Sterling Hill mines were closed, and all mine development was concentrated at Mine Hill. Construction of a new smelting plant at Palmerton, Pa., was started in 1898; operation began in 1900, which permitted eventual closing of the old plants at Newark, Jersey City and Bethlehem.

In 1906, Mr. R.M. Catlin began the modernization of mining methods; sinking of the Palmer Shaft was started, and by 1911, a new and larger mill was built, and all surface operations were centralized at the new shaft location.

In 1910, drill holes at Sterling Hill proved continuation of ore below the old mines; in 1911-'12, the mines were unwatered, and a new shaft started.

In 1915-16, a new mill was built at Sterling Hill. Development and mining have continued with few interruptions at both mines. The Franklin mine was finally exhausted and shut down in September 1954. In recent years the Sterling mine has been modernized, with a new shaft and ore handling facilities ready to resume operations when economic conditions warrant.

The history of mineralogical and geological investigations runs concurrently with the development and exploitation of the deposits, first inspired by the interest and enthusiasm of Dr. Fowler. Here were two obviously large deposits; the material resembled iron ore, but could not be smelted to produce iron; the red oxide looked like good copper ore, but would not yield copper. The first problem was: "What is it?" the second: "What can be done with it?" Dr. Fowler found answers to the second question.

In 1810, Prof. A. Bruce, in one of the first mineralogical papers in American scientific literature, presented the first analysis and description of the "red oxide of zinc".

In 1818, Wm. McClure, in observations on the Geology of the U.S., mentions: "A new variety of this metal (Zinc) has been discovered (in New Jersey) in such abundance, that it promises to be a very valuable acquisition.... it is a red oxide, composed of ZN-76%, O-16%, and oxides of Mn and Fe-8%."

In 1819, P. Berthier, in Paris, confirmed Bruce's work, and suggested the name: Manganesian Oxide of Zinc; he described and named the mineral Franklinite.

In 1820, J. Pierce published the first geological description of the highlands, and started a controversy on the age of the White limestone, which he stated was "not Archean," that lasted until 1898, when Wolff and Brooks established the pre-Cambrian age.

Between 1822 and '32, 25 papers appeared, mainly description of minerals found. Torrey, in 1882, first reported the "siliceous oxide of zinc;" Vanuxem and Keating, in 1824 published the first correct description and analysis of this material, which was named Troostite, in 1832, and later (1846) became known as willemite. In 1822, a list of 29 minerals was noted for the locality.

From 1833 to 1849, only 12 papers were published. In 1836, and 1840, the First and Final reports of H.D. Rogers appeared, with a comprehensive geological description; the ores were considered to be of igneous origin, emplaced in metamorphosed Paleozoic limestone. In 1844, J. D. Dana lists 34 minerals; and Alger suggests the name Sterlingite for the red oxide.

From 1850 to 1879, 73 papers appeared; these show a notable increase in consideration of economic and metallurgical problems. In 1855, Kitchell ascribes a sedimentary origin to the ores, and believes the White limestone to be older than the Blue. In 1868, G. H. Cook presents a good physical description of the mines, and placed all ores in the metamorphosed pre-Cambrian. 41 minerals listed.

From 1880 to 1899, 62 papers appeared; many of these are mineralogical, describing the many new minerals found by increased development of the mines. In 1890, Nason proposes a contact metamorphic origin for the ores, later advocated by Kemp, in 1893. Kemp lists 66 minerals.

From 1900 to 1934, 100 papers were published, these concern new minerals, re-study of old material, and are notable for increased accuracy in analysis, and more precise mineralogical descriptions.

Time does not permit acknowledgement to all the deserving contributors, but it would be remiss to fail to mention Dr. Palache of Harvard University, and Mr. Bauer of our laboratory here at Franklin, Palache first worked with Spencer in the preparation of the section on mineralogy in the Franklin Furnace Folio published in 1908. Bauer came to Franklin in 1913 shortly after this publication appeared, and devoted much time to the study of the minerals during his long residence here. These two names appear as author or co-author of more than 20 papers prior to the publication of Palache's "Minerals of Franklin and Sterling Hill," in 1935. In 1908, Palache lists 91 "well defined species," and in 1935, he lists 148. The interest and enthusiasm of both men continued, with constant correspondence, and resulted in adding perhaps 20 additional species to the list. Our loss, now that they are gone, is great; but we may thank them for their many contributions to our knowledge of Franklin minerals.

* * * * *

1973 DUES ARE PAYABLE NOW - - - - PLEASE GET YOUR RENEWAL IN

MEMBERSHIP RENEWAL

I would like to renew my membership in the Franklin-Ogdensburg Mineralogical Society for the year _____. Dues of \$3.00 are attached.*

Name (Mr. Mrs. Miss) _____

Address _____ Tel. No. _____

Zip Code _____

Please advise of any change in address.

APPLICATION FOR MEMBERSHIP

I would like to apply for membership in the Franklin-Ogdensburg Mineralogical Society. \$3.00 for 1973 dues and a registration fee of \$1.00 is attached.*

Name (Mr. Mrs. Miss) _____

Address _____ Tel. No. _____

Zip Code _____

Please PRINT your name and address exactly as you wish it to appear on your mail.

LITERATURE ORDER *

NOTE: PLEASE ADD 30¢ PER ITEM FOR HANDLING AND MAILING, PLUS 5% SALES TAX.

		<u>No.Copies</u>	
Frondel	The Minerals of Franklin and Sterling Hill (Price to F.O.M.S. Members only)	_____ @ \$8.00	_____
Jones	Nature's Hidden Rainbows - Fluorescent Minerals of Franklin, N.J.	_____ @ 2.95	_____
Knoll	Mineral Identification for the Amateur	_____ @ 1.00	_____
Kushner	An Abbreviated Manual of Franklin Minerals	_____ @ 10.00	_____
Mason	Trap Rock Minerals of New Jersey	_____ @ 2.00	_____
Shuster	Historical Notes on the Iron and Zinc Mining Industry in Sussex County, N.J.	_____ @ 1.00	_____
Sims	Geology of the Andover Mining District, Sussex County, New Jersey	_____ @ 1.00	_____
Widmer	Geology and Geography of New Jersey	_____ @ 6.00	_____
Wilkerson	Minerals of Franklin and Sterling Hill	_____ @ 2.00	_____
Yolton	Fossils of New Jersey	_____ @ 1.50	_____
	Back issues of THE PICKING TABLE (Note issues)	_____ @ .50	_____
	F.O.M.S. Button or Lapel Pin (Specify)	_____ @ 2.50	_____
	F.O.M.S. Shoulder Patch	_____ @ 1.00	_____
	Sub Total		\$ _____
	New Jersey Sales Tax 5%		_____
	Mailing and Handling		_____
	Total (Check enclosed)		\$ _____

*Make checks payable to Franklin-Ogdensburg Mineralogical Society, Inc.

Mail to Robert H. Thomas, Treasurer, 802 Lindsley Drive, Morristown, N.J.

Address correction requested by:
FRANKLIN OGDENSBURG MINERALOGICAL
SOCIETY, INC. BOX 146,
FRANKLIN, NEW JERSEY, 07416



MR. ROGER GROVER
ULTRA VIOLET PRODUCTS, INC.
5114 WALNUT GROVE AVE.
SAN GABRIEL, CA 91778