The Picking Table

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Inside this issue:

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THE PICKING TABLE

Volume 51, No. 2 – Fall 2010

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The Picking Table is the official publication of the Franklin Ogdensburg Mineralogical Society, Inc. (FOMS), a non profit organization, and is sent to all members. *The Picking Table* is published twice each year and features articles of interest to the mineralogical community that pertain to the Franklin-Ogdensburg, New Jersey area.

Members are encouraged to submit articles for publication. Articles should have substance and be cohesively written and submitted as a double-spaced Microsoft Word document to ***thepickingtable@gmail.com***.

The views and opinions expressed in *The Picking Table* do not necessarily reflect those of FOMS or the editors.

FOMS is a member of the Eastern Federation of Mineralogical and Lapidary Societies, Inc. (EFMLS).

The Picking Table is printed on acid free and chlorine free paper.

About the Front Cover

Featured on the front cover is a rare 0.5 mm Franklin anatase crystal. The photograph, taken by Alfred Standfast, M.D. is a 240X enlargement to a 35 mm slide and enlarged 600% for printing.

The specimen has been donated to the Franklin Mineral Museum by its owner Ralph Thomas. It is specimen # 6117 in the museum micro-mount collection and is available for viewing.

The complete story appears on page 14 of this issue.

Patricia "Patti" Hauck
1947-2010

Tema J. Hecht
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If you knew Patti, you knew friendship, generosity, nurturing, and love. I have known Patti for 20 years, and she gave me all of these things.

When Richard "Dick" Bostwick and I got married, it was Patti who organized our wedding reception at Sterling Hill. She had wonderful ideas about our party and was so excited to be able to put her loving touch on our union. To this day, Dick and I are so very grateful to Patti for throwing one heck of a good party in our honor!

Patti loved managing the snack bar/kitchen area at Sterling Hill. That was her place to be; the snack bar's formal name was Miners Lunch Box, but everyone knew it was Patti's place. She would help all the little children decide what they wanted to eat and call them "Honey" or "Sweetie." She loved using pet names and when she called you one, you knew she meant it. It was always wonderful coming to Sterling Hill and being greeted by Patti with a kiss and a hug. Of course, we talked about our husbands, children, and family, and if Patti let you use "her" kitchen at Sterling Hill, you had better leave it just the way you found it, or else!

Patti was responsible for organizing the food and decorations at the Sterling Hill holiday party and those decorations were always wonderful. The mineral community will forever be thankful to Patti for coordinating the food at the spring banquet at Sterling Hill.

I remember when Dick and I visited Patti and Bob at their home in Augusta. What an incredible hostess Patti was! She made us feel so at home from the moment we walked in until the time we left. Dick and I also had the honor of meeting her beloved dog, Missy, who was as attentive as her mistress. The dinner Patti cooked for us still makes my mouth water whenever I think of it.

I often think about the phone conversations Patti and I had together over the years. She always had time to talk unless her family was there or she was cooking dinner for Bob.

The night before Patti went into the hospital I called and we talked for a long time. I was so glad that I didn't put off that call until another day. There wasn't another day.

I hope that wherever there may be angels, they know how lucky they are to have Patti in their midst.

Pat and Bob Hauck.

Patti Hauck at work.

From the Editor's Desk

Fred Young
234 Warbasse Jct. Road
Lafayette, NJ 07848

"Behold the turtle. He makes progress only when he sticks his neck out." James Bryant Conant

Production of *The Picking Table* continues to go according to plan. Hi-speed digital design and digital printing technology allows the editorial staff sufficient time to work efficiently and effectively editing the variety of submissions in order to meet all schedules.

The past history of the FOMS is archived in 93 editions of *The Picking Table* written during its first 50 years and is now available for purchase on DVD in an Adobe Acrobat PDF format, designed and produced by Vice President Richard Keller-see ad on page 7 of this edition.

The future history of the FOMS has yet to be archived and that depends on the continuing efforts of a dedicated editorial staff and continuing submissions from authors with a passion to write about Franklin and Sterling Hill.

As noted in previous *PTs* research on the Franklin and Sterling Hill mineral deposits is being done by various geologists, mineralogists, university professors, and industry scientists New mineral assemblages and new mineral species are being studied and results of these studies will be published.

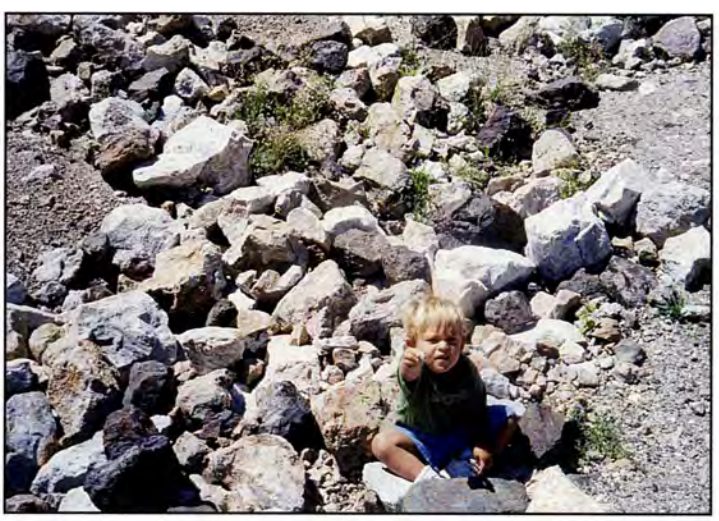
The *PT* editorial staff are all professionals in their fields and will work closely with authors to bring these studies into print.

The two photos on this page are of a famous FOMS mineral collector of the past and a yet to be famous FOMS mineral collector of the future.The lady is FOMS co-founder Ethel Packard "Sunny" Cook. The lad is new FOMS member Josh Macmillan, grandson of editor Fred Young. They are both sitting in their favorite rock pile looking for that special rock. Sunny is in the Parker Dump circa 1960 and Josh in the Buckwheat Dump in 2003.

The lady represents all the early FOMS members who wrote the stories of the past and the lad represents all the younger FOMS members who have to write the stories for the future.

If you have a story to tell don't keep it in your shell. Like the turtle, if you don't stick your neck out you won't get anywhere and nobody will read your story.

FOMS co-founder Ethel Packard "Sunny" Cook in the Parker Dump.



New FOMS member Josh Macmillan in the Buckwheat Dump.

Franklin-Ogdensburg Mineralogical Society, Inc.

Fall - Winter 2010 Activity Schedule, compiled by Tema J. Hecht

Saturday, Sept. 18, 2010
9:00 AM - Noon — F.O.M.S. Field Trip — Collecting at the Taylor Road site.
Meet at the Franklin Mineral Museum. Park, and walk from there. Fee charged.
10:00 AM - Noon — F.O.M.S. Micro Group, Franklin Mineral Museum.
1:30 PM - 3:30 PM — F.O.M.S. Meeting and Lecture, Franklin Mineral Museum:
The Balmat Zinc Deposits: One of the Greatest Ore Deposit Stories Ever Told, by William deLorraine.

Saturday and Sunday, September 25-26, 2010
****54TH ANNUAL FRANKLIN-STERLING GEM & MINERAL SHOW**
Sponsored by the Franklin Mineral Museum.
Franklin Middle School, Washington St., Franklin, New Jersey.
9:00 AM to 6:00 PM Saturday (indoors), 10:00 AM to 5:00 PM Sunday (indoors).
The ticket price covers the show, *The Pond* outdoor swap, and admission to the Franklin Mineral Museum: $7.00 per day for adults, $4.00 per day for children (6-16).

The Pond Swap-and-Sell, sponsored by the F.O.M.S., takes place outdoors on the school grounds from 7:30 AM to 6:00 PM on Saturday, and from 9:00 AM to 5:00 PM on Sunday. Show admission required.

The F.O.M.S. Annual Banquet starts at 6:30 PM on Saturday at the **GeoTech Center, Sterling Hill Mining Museum, Ogdensburg, New Jersey.**
Tickets may be obtained at the F.O.M.S. show table for $18.00.
The meal is an all-you-can-eat buffet; soda, tea, and coffee are included.
B.Y.O.B.
After the banquet there will be an auction for the benefit of the F.O.M.S.
Please plan on donating a good specimen, artifact, book, etc.!

** Saturday and Sunday: Events at the Sterling Hill Mining Museum.
For more information, please call: **(973) 209-7212**.
Or you can visit the website at **www. sterlinghillminingmuseum.org**

Saturday, October 16, 2010
9:00 AM - Noon — F.O.M.S. Field Trip — Collecting on the Buckwheat dump. Fee charged.
10:00 AM - Noon — F.O.M.S. Micro Group, Franklin Mineral Museum.
1:30 - 3:30 PM — F.O.M.S. Meeting and Lecture — Franklin Mineral Museum:
Russian Lapidary Treasures, Large and Small, by John Sanfaçon.

**9:00 AM – 3:00 PM and 6:00 PM – 10:00 PM—Sterling Hill Mining Museum.
Collecting permitted on the Mine Run dump and in the Fill quarry, Passaic pit, and "Saddle" area.
For museum members only. $5.00 admission fee plus $1.50 for each pound of material taken.

Saturday, October 30, 2010
** **21st Annual *ULTRAVIOLATION***, a Show-Swap-Sell-Session featuring fluorescent minerals *only*.
First United Methodist Church, 840 Trenton Road, Fairless Hills, Pennsylvania.
9:00 AM to 4:00 PM, $2 donation. "If your rocks don't glow, you're at the wrong show."
Table space available. For information, call 856-663-1383 or e-mail <ultraviolation@yahoo.com>.

Saturday, November 6, 2010

6:30 PM – 9:30 PM — Night Dig on the Buckwheat dump, for the benefit of the Franklin Mineral Museum. Doors open at 6:00 PM for check-in and mineral sales. Admission $10.00 adult, $8.00 children 3-12 years of age. Poundage fee charged. **Call for details: 973-827-3481.

Saturday, November 20, 2010

9:00 AM - Noon — F.O.M.S. Field Trip—Sterling Hill Mining Museum. Collecting permitted on the Mine Run dump and in the Fill quarry, Passaic pit, and "Saddle" area. $5.00 admission fee plus $1.50 for each pound of material taken.

10:00 AM - Noon — F.O.M.S. Micro Group, Franklin Mineral Museum.

1:30 - 3:30 PM — F.O.M.S. Meeting and Lecture — Franklin Mineral Museum: *Stromatolites from New Jersey*, by Derek Yoost.

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Most F.O.M.S. field trips are open only to F.O.M.S. members aged 13 or older. Proper field trip gear required: hard hat, protective eyewear, gloves, sturdy shoes.

****Activities so marked are not F.O.M.S. functions but may be of interest to its members. Fees, and memberships in other organizations, may be required.**

Any information in this schedule, including fees, is subject to change without notice.

The FOMS Activity Schedule is compiled by Tema Hecht <thecht@att.net>

Thanks go to Fred Young, Earl Verbeek, Ralph Thomas, the Franklin Mineral Museum, and the Sterling Hill Mining Museum for this information.

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FOMS 27th President, William R. Truran

President's Message

As my turn as FOMS president draws to a close, I would like to think back on my time "at the helm."

I believe that FOMS has a number of dedicated Board members; without them the Society would not exist. We all owe a sincere "thank you" to these individuals who, beyond their love for the unique qualities of the Franklin and Sterling Hill ore deposits, have devoted time and energy to maintain our presence. Indeed, without such people the community of interest here would certainly suffer.

I would also like to recognize the many members of our Society. This is a large "club" with many active members who appreciate the solid joys of the geological features of this area. The members' enthusiasm can be seen in the many outings we have; and photos of some of these can be seen in the following pages in this issue. I had fun and learned a lot from the Hamburg Quarry trip of May 15, 2010. This field trip revealed much to me, surprisingly because it is only a few hundred yards from where I live (in Crystal Springs).

As seen in the pages of this very Picking Table, this Society is a great benefit to our world—there is the fun of prospecting at local quarries and sites, the satisfaction of collecting the matchless and world class minerals, the academic dissertations that extend the boundaries of the science, the beauty of the rainbow of colors in photographs of specimens, and the support between the Franklin Mineral Museum, Sterling Hill Mining Museum, and the local history and people. I personally have been delighted becoming more familiar with the camaraderie of companions with similar interests—hoisting a few drinks while inspecting some fluorescent finds and trades at an old miner's bungalow or a Better Homes house from the New Jersey Zinc Company on Green Street similar to where I grew up.

This Society has been for me a learning experience, an eye-opener to the lore and assets of our local natural wonders. It has been a pleasure to have had a chance to help carry the fluorescent torch forward.

Bill

Letters to the Editor

I was pleased to see Don Halterman's article on the purported greenockite in the spring 2010 *The Picking Table*. Several years ago I took a little sample of this same yellow coating home from the saddle between the Passaic & Noble pits under the assumption that it could be greenockite. It occurred on a calcite cleavage rhomb and was associated with some attractive black dendrites. I was very skeptical, but since it was abundant at the outcrop and did not weigh much it was an easy and cheap addition of a potentially rare mineral to my collection.

In 2006, I had access to a portable x-ray fluorescence (XRF) analyzer that staff at my former environmental consulting job were using to determine the metal content of soil samples. XRF works much like a UV lamp, it irradiates a ~1-sq.-cm target with high energy x-rays and the metals in the target fluoresce in element-specific softer x-rays. It mostly reads the surface but the x-rays can penetrate a little into the interior of the sample. The instrument analyzes the resulting x-ray fluorescent spectrum to give the concentration of calibrated metals in the target. (In this case, the suite of calibrated metals was determined by the needs of the environmental project.) It is not a complete analysis because it does not detect non-calibrated metals and non-metals, but the test is non-destructive and quick. Thus, it is a useful tool for differentiating some mineral species, such as solid solution series (e.g., almandine-spessartine) or for giving a likely yes/no for certain mineral species of simple composition (e.g., greenockite, ilmenite, sphalerite). Interpreted in conjunction with other mineralogical information, the results can be very enlightening.

My primary interest at the time was using XRF to distinguish the garnet species from many samples in my Connecticut mineral collection, particularly the garnets from pegmatites. The latter are largely unanalyzed in the literature and were assumed to be spessartine due to associated black (purported Mn-oxide) staining and coatings. Because the XRF was calibrated to detect Fe and Mn, and the samples were obviously garnets, this was a perfect application. I should state here that the XRF analyzer gives data in ppm, not atomic abundance, but since these two elements have nearly the same atomic weight, I did not bother to correct for this. Even so, the XRF showed that Connecticut garnets hosted by schist and gneiss are very pure almandine and that nearly all of the pegmatitic garnets are also almandine, though with a much greater spessartine component than in the metamorphic host rocks. Only one pegmatitic garnet had an Fe:Mn ppm ratio of <1, barely. A unique Mn-rich metamorphic lens at Jail Hill Road in Haddam does have spessartine, the XRF data confirming what I read in the literature about that site.

Because I also have a large Franklin-Ogdensburg mineral collection, I also tested several garnets from the district and a few other minerals just to see what would turn up. The XRF sadly was not calibrated for Ca or Mg, which would have been useful on the Fr-Og garnets because they clearly have the local chemistry available to cross over the normally separate pyralspite and ugrandite series. But happily, because the XRF was calibrated for Cd, I tested that purported greenockite from the saddle. Except for the thin crust of this unknown mineral, the other crystal specimens are much thicker than the ~1-sq.-cm detector on the XRF and so were unlikely to be penetrated much by the x-rays.

The results, though limited, show several interesting things. The Fe:Mn ratios in the garnets are all <1, indicating that they are likely spessartine, assuming any undetectable Ca or Mg in them do not predominate over the Fe or Mn. The 2 Franklin garnets appear to be a little more Mn rich than the Ogdensburg ones. Not surprisingly, all the garnets show a few relative % Zn, but also a little Ti only in those from the saddle. These results could be caused by either elemental or mineral inclusion impurities. As expected, a magnetite crystal (determined by its metallic luster and strong magnetic attraction) from the saddle has higher Fe and lower Mn and Zn than a typical franklinite crystal from typical Ogdensburg ore. But note the nearly 8 relative % Ti abundance in the magnetite, suggesting a ulvospinel component. A potential sphalerite sample (based on visual and physical properties and fluorescence) showed 84 relative % Zn with minor Mn and Fe, and no Cd. Based on all the information, this sample was clearly sphalerite. Lastly, the purported greenockite showed mostly Fe with much less Mn, followed by traces of Sr, Ti, Pb and then Zn, with no Cd detected.

The abundance of Fe in the XRF data of the yellow mineral is consistent with the Halterman EDS results. The presence of lesser Mn and minor Sr, Ti, Pb and Zn may be as impurities in the mystery mineral or, given that the mineral occurs as a thin, granular crust, that the XRF was detecting them in the underlying calcite, which does fluoresce red-orange under SW UV. Much like the EDS results, the XRF data do not tell me what the mystery mineral is, but they do tell me it is definitely not greenockite. More of this mystery mineral has been retrieved for study.

Combining the two test results with the highly weathered nature of the occurrence and abundant local magnetite, I believe it is probably just yellow ochre (aka goethite) and the specimen was sent into the backyard rock dump. For those shopping on ebay, it proves as always, caveat emptor!

Keep up the great publication!

Harold Moritz
East Haddam Connecticut

This letter was sent before Harold Moritz became an associate editor of *The Picking Table.* He is an associate editor beginning with this issue. We welcome his professional support.

Mineralogical News Update From Franklin and Sterling Hill

Abstract of the redefinition of Franklin esperite formula and structure.

Esperite from Franklin, New Jersey, was first described by Moore and Ribbe (1965) as monoclinic with a well-developed "superlattice" a = 2 x 8.814(2) Å, b = 8.270(3) Å, c = 2 x 15.26(1) Å, β 90°, space group P21/n (subcell), and the chemical formula $PbCa_3(ZnSiO_4)_4$. They attributed "superlattice" reflections to the ordered distributions of Pb and Ca cations over four beryllonite-type subcells for esperite with the Ca:Pb ratio greater than 2:1.

We examined two esperite fragments from the type sample using single-crystal X-ray diffraction, electron microprobe analysis, and Raman spectroscopy. Although both fragments have Ca:Pb 1.8, one exhibits the "superlattice" reflections as observed by Moore and Ribbe (1965), whereas the other does not. The sample without "superlattice" reflections has unit-cell parameters a = 8.7889(2), b = 8.2685(2), c = 15.254(3) Å, β = 90.050(1)°, V = 1108.49(4) $Å_3$, and the chemical composition $Pb1.00(Ca1.86Fe0.072+Mn0.04Cr0.023+)=1.99(Zn1.00Si1.00O_4)_3$. Its crystal structure was solved in space group P21/n (R1 = 0.022). Esperite is isostructural with beryllonite, NaBePO4, and its ideal chemical formula should, therefore, be revised to $PbCa_2(ZnSiO_4)_3$, Z = 4. The ZnO_4 and SiO_4 tetrahedra in esperite share corners to form an ordered framework, with Pb_2+ occupying the nine-coordinated site in the large channels and Ca_2+ occupying the two distinct octahedral sites in the small channels. The so-called "superlattice" reflections are attributed to triple twins, a trilling of ~60° rotational twinning around the b axis, similar to those observed in many other beryllonite-type materials. A phase transformation from a high-temperature polymorph to the esperite structure is proposed to be responsible for the twinning formation.

Reference:

Tait, K., Yang, H., Downs, R.T., Li, C., Pinch, W.W. (2010): The crystal structure of esperite, with a revised chemical formula, $PbCa_2(ZnSiO_4)_3$, isostructural with beryllonite. American Mineralogist, 95, 699-705.

Sterling Hill villyaellenite changed to miguelromerite.

Apatite (CaF) reverts to fluorapatite.

Pimelite reverts to willemseite variety pimelite.

Now available!! *The Picking Table*, the "Official Journal of the Franklin - Ogdensburg Mineralogical Society," on DVD in Adobe Acrobat PDF format.

Ninety-three Issues, 2,256 scans, and hundreds upon hundreds of both B&W and color photos of minerals, events, collectors, as well as articles, event schedules, past officers and editors, mineral descriptions, etc.

All issues have been scanned from ORIGINAL issues of *The PT* In some cases "imperfections" will be evident such as yellowing of 50-year-old paper and the occasional marginal note, but all literary inclusions are clearly legible and the photos are true to the originals.

The knowledge you will acquire as you read through these issues will be evident.

Price for the 2-DVD set is $45.00, plus $5.00 shipping. Personal checks should be made payable to "F.O.M.S." and mailed to Denise Kroth at: 240 Union Ave. Wood-Ridge, NJ 07075. Technical support is provided by Richard Keller (e-mail: FranklinNJ@hotmail.com).

Spring 2010 Field Trips
A Photo Journey

James E. Rumrill
Readding Place
Towaco, NJ 07082

TAYLOR ROAD SITE: 3/20/10

View from the street .
This and subsequent photos by the author.

Inside the site.

Collecting fluorescent rocks in daylight.

Searching through the big rocks.

Family of collectors.

Plenty of rocks left.

BRAEN QUARRY: 4/17/10

Collectors arrive early.

Mark Deighan (L) quarry safety manager sets the rules to Joe Kaiser (C) field trip chairman.

Collectors working the quarry.

Joe Kaiser (C) pointing to a mystery mineral.

Plenty of rocks left for the next field trip.

Collectors packing up late.

HAMBURG QUARRY: 5/15/10

View from the quarry top looking South.

Quarry manager Mike Benza (C) sets safety rules to Joe Kaiser (R).

Collectors dig in.

A collector taking a close up look at a big piece of calcite.

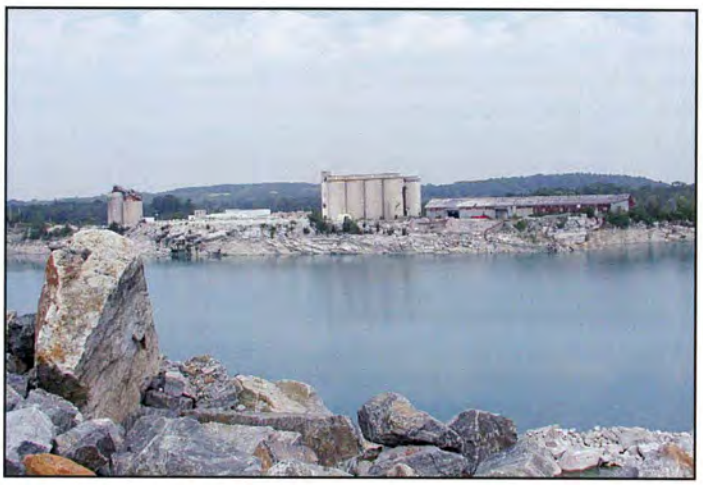
Joe Kaiser about to swing a big sledge hammer.

Many lbs of rocks will leave the quarry today.

LIMECREST QUARRY: 6/20/10

FOMS has been collecting here for over 50 years.

Waiting for the gates to open.



Limecrest lake covers the bottom of the quarry.

Collectors at the top of the quarry above the lake.

Plenty of dry rocks left to collect.

Veteran collector, Sarna Strom, packs rocks into her van.

F.O.M.S. FIELD TRIP SAFETY RULES AND REGULATIONS

Field trips are an essential activity for the F.O.M.S., and every member should be aware of the rules which govern them. This version was updated in 1995 after careful review by the F.O.M.S. Field Trip Chairman and officers. All members should be familiar with these rules and regulations, not only for their own safety and that of others, but also to maintain the excellent safety record of the F.O.M.S., which has given its members access to many unique and important collecting localities.

1. INSURANCE COVERAGE. The F.O.M.S. maintains liability insurance coverage for its members under a policy sponsored by the Eastern Federation of Mineralogical and Lapidary Societies (EFMLS). Non-F.O.M.S. members who are guests at any collecting event sponsored by the F.O.M.S. must be able to demonstrate that they are covered by club-sponsored EFMLS liability insurance or its equivalent.
A. Events are restricted to F.O.M.S. members unless otherwise advertised.
B. Participating organizations in F.O.M.S.-hosted collecting events must provide proof of liability insurance coverage in advance.
C. All participants in F.O.M.S.-hosted collecting events must be able to present proof of membership in a covered organization in order to be admitted.
NOTE: the F.O.M.S. maintains lists of current members and of organizations covered by EFMLS liability insurance. An EFMLS membership card alone is not sufficient.

2. WAIVERS OF LIABILITY. It is the responsibility of all F.O.M.S. members and authorized guests to sign Waiver of Liability statements before entering a collecting area. The privilege of collecting is dependent on fulfilling this requirement. All persons entering the collecting area must personally sign such a release or releases, absolving the property owner, the F.O.M.S., and its officers of any responsibility for injury, loss of life, and property damage or loss.

3. POSTED TIMES. Collecting begins no sooner than, and lasts no later than, advertised collecting times. The F.O.M.S. Field Trip Coordinator and/or his/her designated representative(s) are the only F.O.M.S. officials who may designate a variation of the advertised collecting hours.

4. ELIGIBILITY. Children under 13 years of age are ineligible for collecting events unless otherwise authorized by the F.O.M.S. official in charge. Persons who appear intoxicated or under the influence of drugs, or whose judgment or physical ability to collect appears to be impaired, are also ineligible to collect.

5. COLLECTING AREA LIMITS. Collecting is restricted to areas within boundaries. Areas which are off-limits to collecting may be indicated by signs, fences, ropes, etc., or the instructions of the F.O.M.S. safety staff. Collecting is strictly prohibited within 30 feet of a vertical or overhanging rock wall; in areas above mine entrances; within three feet of a cliff edge, ledge, or quarry bench; and on an incline either above or below a collector who is already in position.
Vehicles are restricted to authorized parking areas; exceptions may be made only by the F.O.M.S. official in charge.

6. CLOTHING. Proper footgear, headgear, gloves, and safety goggles or safety glasses are not only a good idea but mandatory! Your health is more important than any mineral specimen. Rugged boots or shoes, preferably with steel safety toes, should be worn. Collectors wearing sneakers, sandals, or other flimsy footgear will be denied access to the collecting area. Hard hats should be worn on all collecting trips, and MUST be worn on all trips to operating quarries or on other field trips so designated. Gloves should be worn to protect the hands when breaking or handling rock. Safety goggles or glasses (with shatterproof lenses) should always be worn when breaking rock, or when other collectors nearby are doing so.

7. TOOLS. Proper tools should be used. Choose substantial rock or masons' crack hammers, sledgehammers, and cold chisels for breaking rock. Common carpenters' hammers, wood chisels, screwdrivers and the like are unacceptable since they can break or chip when used on rock. Mushroom heads on chisels should be ground away to prevent flying metal chips.

8. OTHER PRECAUTIONS. Field collecting is a privilege, not an excuse to abandon common sense. Use caution when reaching between rocks and into crevices - snakes hide there! Familiarize yourself with poison ivy - the itch won't quit. When ascending or descending a rock pile, be extra careful; such rocks are often loose. Don't rely on grabbing small rocks for climbing leverage. Use the buddy system, and never collect alone; always remain within shouting distance of another collector. Carry a first aid kit. In hot weather, bring sun-blocker and carry a supply of drinking water plus salt tablets. If a hard hat is not required, wear a hat which provides protection from the sun. Walk carefully when ascending or descending; in particular, climb out of deep quarries slowly. And....don't throw anything, particularly rocks!

9. RESPECT FOR PROPERTY. Watch those cigarettes and matches in wooded or grassy areas. DO NOT LITTER! Carry all your trash out with you. Don't break glass bottles, as they can cause flats on quarry vehicles. Don't leave metal tools behind, as they can cause severe damage to rock-crushers. Above all, do not touch, deface, damage, or vandalize quarry equipment; this can not only terminate field trip privileges for the F.O.M.S. but also lead to lawsuits.

10. COMPLIANCE AND PENALTIES. F.O.M.S. safety staff members wear fluorescent greenish-yellow armbands, and have authority to warn violators or expel them from the collecting area. Failure to observe F.O.M.S. safety rules and regulations and failure to obey the instructions of an F.O.M.S. safety staff member are alike considered violations of F.O.M.S. protocols and are grounds for immediate eviction from F.O.M.S. events. Repeat violators will be barred from future field trips.

❖ ❖ ❖ ❖ ❖ ❖ ❖

Collecting under F.O.M.S. auspices is not a right but a privilege. Some field trip areas are open to collecting only because of the F.O.M.S.'s excellent safety record, and injury or property damage on a field trip could lead to permanent canceling of that trip. When you collect, please watch out not only for yourself but also for your fellow collectors AND the F.O.M.S.; you are also protecting the collecting privileges of future generations of collectors.

Reprinted from *The Picking Table* Volume 39 No. 1 Spring/Summer 1998

Creating a Post-Metamorphic Cooling Curve for the Franklin and Sterling Hill Zinc Deposits

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The history of Precambrian rocks in the Highlands following their high-grade metamorphism at about 1050 million-years-ago is poorly known. Yet this has important implications for the time of formation of various post-metamorphic mineral assemblages at the Franklin and Sterling Hill mines. By using different dating techniques such as uranium-lead isotopes on monazite and titanite, and argon isotopes on hornblende, biotite, and muscovite, each of which cool to their closure temperatures at different times, a cooling curve may be constructed (Fig.1). That means that at a given point in geologic time following metamorphism, as the Franklin and Sterling Hill zinc deposits and their host rocks were slowly cooling, the temperature of the deposits and surrounding areas would be precisely known.

Various minerals at Franklin and Sterling Hill that were formed following metamorphism are stable at different temperatures. Therefore, by comparing the temperature of the various host rock minerals used to create a cooling curve against the stable temperature of a Franklin zinc deposit mineral, the age of formation of that mineral could be determined. As a result, it is possible to develop a timeline, or relative chronology, of some of the major post-metamorphic minerals associated with the zinc deposits.

Potassium-bearing minerals contain radioactive isotopes that decay according to their half-life rates. By measuring the relative amounts of parent and daughter isotopes in these minerals, the time at which the mineral crystallized can be precisely determined. Argon isotope geochronology relies on the measurement of the ratio of daughter ^{40}Ar to parent ^{39}Ar in a potassium-bearing mineral after the sample has been irradiated in a nuclear reactor. Following irradiation, the sample is then heated in steps in a furnace and the ^{40}Ar to ^{39}Ar ratio is measured on a mass spectrometer. Once at least 70 percent of the mineral has been heated, and the ^{39}Ar gas released from the mineral grain, its original cooling age may be calculated (Fig 2). This is a widely used and very effective technique for dating hornblende and mica in rocks that have undergone high-grade metamorphism, such as those in the Highlands, in order to determine their post-metamorphic cooling history. For more detailed information on Ar isotope geochronology, the interested reader is referred to the website shown below.

NOTE: Research is now progressing on a metamorphic cooling curve for use with Franklin and Sterling Hill minerals. Results will be discussed in a future edition of *The Picking Table.*

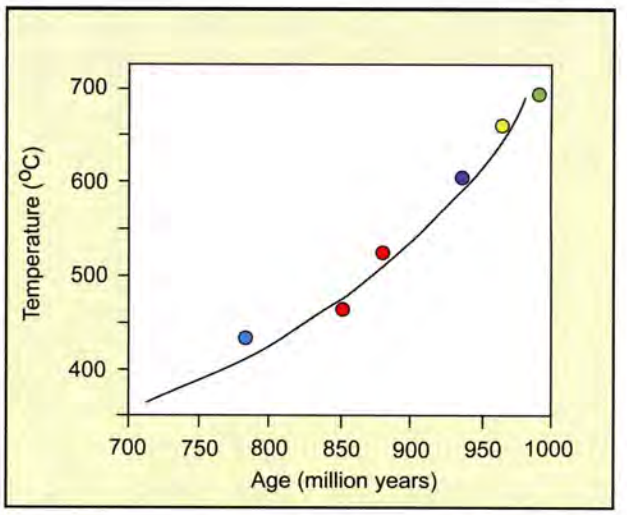

Figure 1. Fictitious cooling curve constructed from five different minerals following high-grade metamorphism.

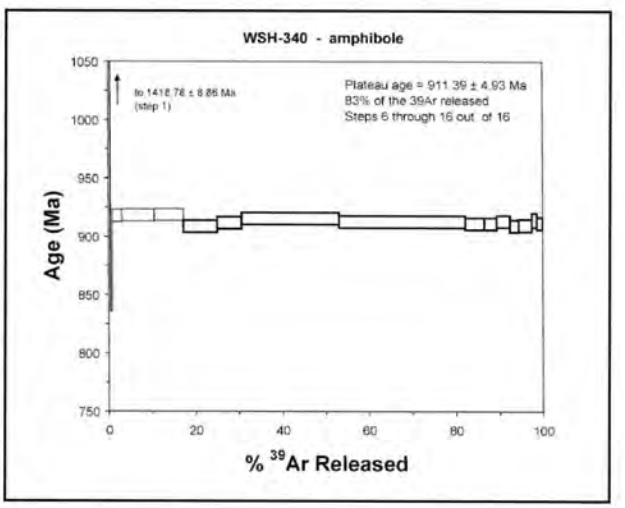

Figure 2. Example of an actual $^{40}Ar/^{39}Ar$ age spectrum for hornblende from the southwest New Jersey Highlands (Volkert, unpublished data). The age of 911.4 million years records the time at which the mineral had cooled to its closure temperature of 550°C.

Reference:

www.geoberg.de/text/geology/07011601.php

Anatase and Its Polymorph Cousins of the Buckwheat

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Rutile, anatase and brookite are the three polymorphs of titanium dioxide (TiO_2) that have the same chemical composition but different crystal forms. They are minor ores of titanium that are used, for example, in white paint and porcelain pigments – widespread minerals that occur in small amounts in metamorphic, igneous and sedimentary rocks. Distinctive bipyramidal, tetragonal, indigo-blue crystals of anatase (octahedrite) are extremely rare at Franklin. The late William B. Thomas, M.D. of the New Jersey shore area collected one of the earliest known tiny, 0.5mm anatase crystal at the Buckwheat (Fig. 1 and 2) in the 1960s. The writer obtained this specimen in the late 1970s and then turned it over to Omer Dean when he and his wife Betty moved to San Antonio, Texas. The micro crystal is now back in the possession of the writer (Omer has noticed that everything is BIG in Texas). The anatase micromount will be presented to the Franklin Mineral Museum for their micromount collection on behalf of Omer and the writer.

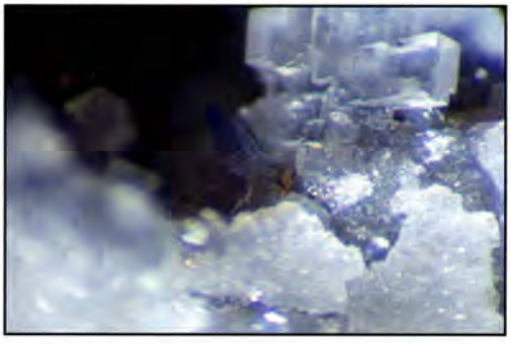

Figure 1. Anatase crystal, 80X, photo by Ralph E. Thomas.

Figure 2. Anatase crystal, 240X, photo by Alfred Standfast, M.D. (note striations at right angles to c axis).

Brookite (Fig 3), as both tabular and prismatic or blocky, reddish-brown orthorhombic striated crystals, is uncommon on the Buckwheat dump. It is a desirable mineral along with another forty or so species that were so eagerly collected by Alice Kraissl, Helen and Joe Warnisky, Ed Wilk and Joe Klitsch, to name a few. "Eagle eye" Steven Kuitems D.M.D. reported that he collected over 25 anatase crystals in altered dolomite during the period of 2002 - 2003.

Rutile (Fig 4.), as black to golden, tetragonal, reticulated, acicular needles, often mistaken for millerite, is quite common in the Buckwheat dolomite and is often found with brookite.

Figure 3. Brookite crystal, 40X, photo by Ralph E. Thomas (note rutile needle at the top left of crystal).

Today there are few collectors searching for micro crystals in the vuggy, sugary dolomite, which is not as abundant now. Instead, they hunt the more exotic fluorescent minerals in the Buckwheat.

References:

Mineralogy for Amateurs by John Sinkankas.

Dana's Textbook of Mineralogy, 4th edition.

Mineralogical Record, Vol. 14 No. 3, May-June, Page 185.

"Rockchatter" of the Rock & Mineral Club of Lower Bucks Co., Pa. Page 1.

Figure 4. Rutile needles, 40X, photo by Ralph E. Thomas.

Letters From the Past

George Elling
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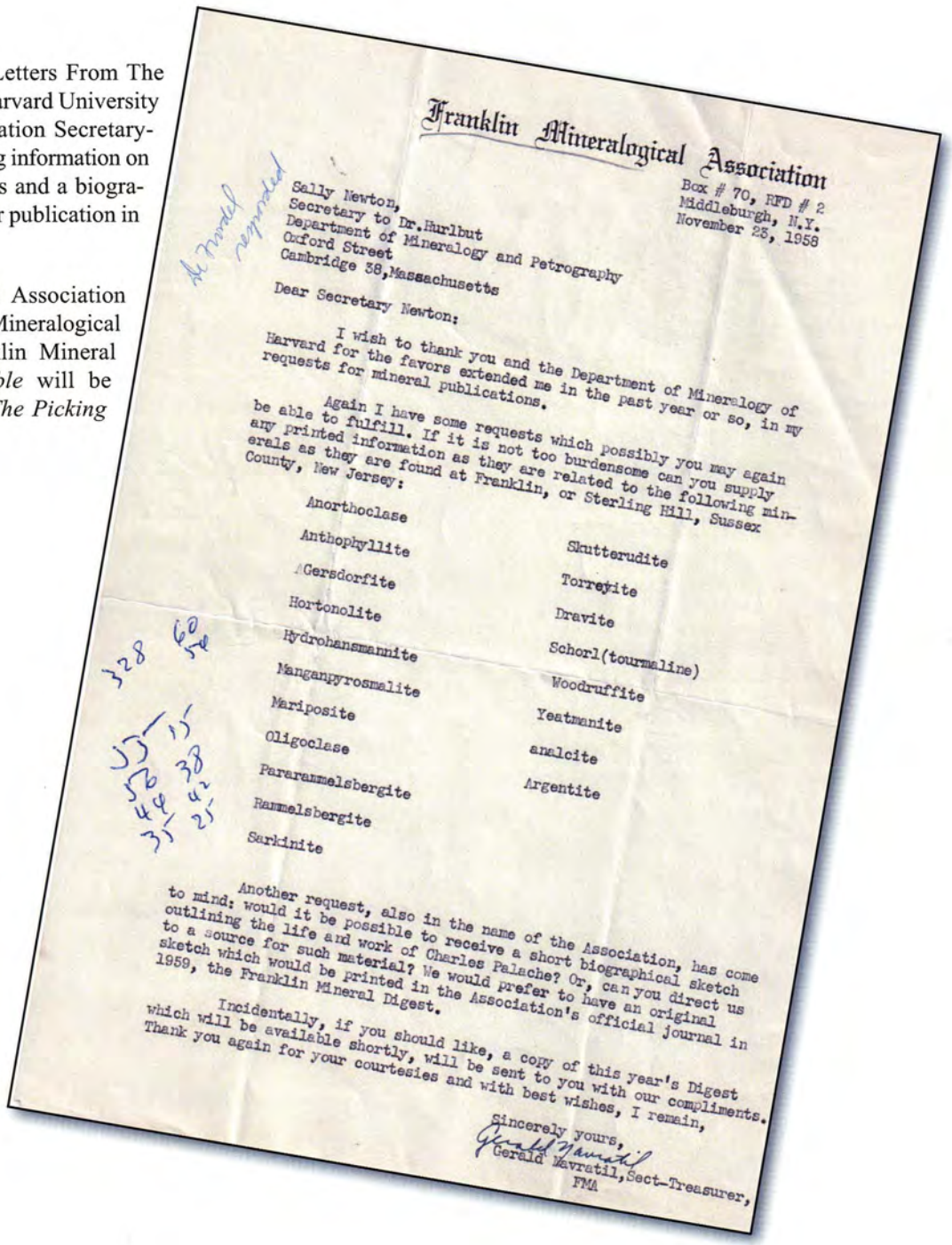
Wyckoff, NJ 07481

"As our seventh installment of "Letters From The Past" we present a 1958 letter to Harvard University by Franklin Mineralogical Association Secretary-Treasurer Gerald Navratil requesting information on Franklin and Sterling Hill minerals and a biographical sketch of Charles Palache for publication in the Franklin Mineral Digest.

How the Franklin Mineralogical Association became the Franklin-Ogdensburg Mineralogical Society, Inc and how the Franklin Mineral Digest became *The Picking Table* will be explained in a future edition of *The Picking Table.*



Franklin Mineralogical Association

Box # 70, RFD # 2
Middleburgh, N.Y.
November 25, 1958

Sally Newton,
Secretary to Dr.Hurlbut
Department of Mineralogy and Petrography
Oxford Street
Cambridge 38,Massachusetts

Dear Secretary Newton:

I wish to thank you and the Department of Mineralogy of Harvard for the favors extended me in the past year or so, in my requests for mineral publications.

Again I have some requests which possibly you may again be able to fulfill. If it is not too burdensome can you supply any printed information as they are related to the following minerals as they are found at Franklin, or Sterling Hill, Sussex County, New Jersey:

Anorthoclase
Anthophyllite
Gersdorfite
Hortonolite
Hydrohansmannite
Manganpyrosmalite
Mariposite
Oligoclase
Pararammelsbergite
Rammelsbergite
Sarkinite
Skutterudite
Torreyite
Dravite
Schorl(tourmaline)
Woodruffite
Yeatmanite
analcite
Argentite

Another request, also in the name of the Association, has come to mind: would it be possible to receive a short biographical sketch outlining the life and work of Charles Palache? Or, can you direct us to a source for such material? We would prefer to have an original sketch which would be printed in the Association's official journal in 1959, the Franklin Mineral Digest.

Incidentally, if you should like, a copy of this year's Digest which will be available shortly, will be sent to you with our compliments. Thank you again for your courtesies and with best wishes, I remain,

Sincerely yours,
Gerald Navratil
Gerald Navratil,Sect-Treasurer,
FMA

Clinochlore From the Franklin, New Jersey Taylor Road Site

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Readding Place
Towaco, NJ 07082

For those who might not be familiar with the Taylor Road site (TRS), it is an unoccupied property largely overgrown with trees and brush, situated between private homes. It is just a short stroll from the Franklin Mineral Museum. A good portion of exposed rock is situated in an open area reasonably free of overgrowth. The largest portion consists of a fairly steep slope that ends close to a neighbor's back yard. Because of this close proximity to residences, it is essential that collectors remain on their best behavior so as not to disrupt neighborhood peace or despoil property. The main dangers that might be encountered at this site are working down slope from one laboring above (for obvious reasons) and the occasional brush with poison ivy, to which I can personally attest.

The minerals found at this site are comparable to that found at the nearby Buckwheat dump. And it is the site for material found by the late Joe Orosz, whose initial investigation enabled the 2007 confirmation of pyroxferroite[1]. The TRS has been an exceptional source for splendid fluorescent sphalerite, as many with a hunger for this flamboyant longwave mineral will testify. Most of the other classic Franklin fluorescent species that one might expect to find on the Buckwheat dump may potentially also be present. I have not personally come across much in the way of vuggy dolomite that is the passion of many local micromineral fans. But with this find, clinochlore has now been verified as occurring at the TRS.

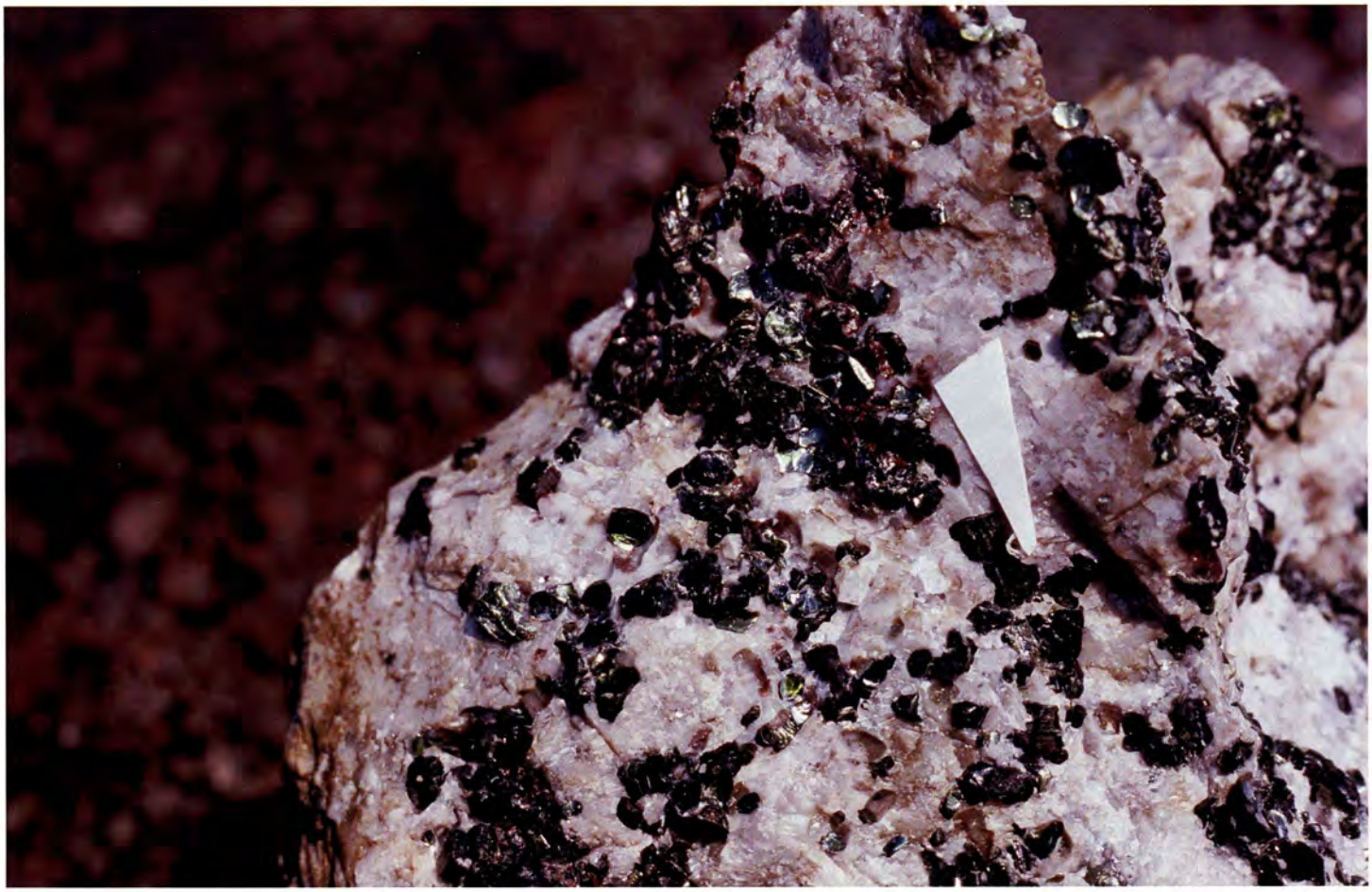
"So what!" would be a typical reaction one would expect to having found clinochlore, which is a member of the chlorite group and hardly rare to boot. Few specimens are appreciated aesthically and it is a mineral group that commonly coats more valuable minerals to the loathing of collectors. But hold on, if you were to consult what Pete Dunn had to say about it in his Franklin/Sterling Hill (F/SH) monograph[2], you will find it described as sparsely found in and around the orebody. However, as Dunn intimates, it may often have gone unstudied and thus unidentified. So a substantial crystallized find of this species as discussed here may be worthy of discussion.

How was clinochore $(Mg, Al)_6(Si, Al)_4O_{10}(OH)_8$ discovered and eventually verified from the TRS? During the April 18, 2009, FOMS (Franklin Ogdensburg Mineralogical Society) TRS field trip, a small boulder was split apart, and it consisted of approximately 1/3 bright orange-red fluorescent calcite and 2/3 of an unidentified species of feldspar. The species of feldspar is unknown though I would like to point out that Dunn's monograph mentions that the majority of local feldspar is microcline. As stated in Dunn's monograph, feldspars[3] are important at F/SH but remain the most understudied of all significant Franklin minerals. It's presumed that the bright orange-red fluorescent calcate indicates a direct connection with the orebody though I am not certain how this calcite/feldspar/chlinochlore mixture fits into the overall orebody paragensis.

While the massive calcite and feldspar initially proved visually indistinguishable from each other as to color or texture in daylight, they are easy to tell apart by a number of means including fluorescence. The blackish platy crystals (individual plates up to 6mm across) that liberally pepper the calcite/feldspar matrix were initially interpreted as being phlogopite by way of their physical structure, size, and the fact is that this mica species is locally abundant; that is, until bright green reflections of light from the sun bouncing off the crystal plates caught my eye. "That's interesting," I thought, so several specimens made it into my collecting pail, which probably would not have happened if they had the typical brownish color of phlogopite.

A week later at the spring Franklin mineral show, on April 25, 2009, as long as I was going to pick up some pre-ordered rare mineral species from Tony Nikischer (Excalibur Mineral Co.), and knowing he also has a deep interest in this locale, I figured why not bring him a sample of these unusual green platy crystals. He likewise found the green crystals most interesting and submitted them for energy dispersive X-ray spectroscopy (EDX) through the Hudson Institute of Mineralogy's Sid and Betty Williams Laboratory, which led to the unexpected clinochlore result. The accompanying photo gives a general idea of its appearance.

It should be mentioned that there are several places in the world where crystals of clinochlore are reported to exceed several centimeters, though it is unclear whether this refers to a crystal plate grouping or a single crystal plate. Nevertheless, the find of decent sized crystal plates of this normally fine-grained material is worth noting. A photo of similar-looking but smaller crystals (<2mm) deposited on Franklin calcite can be found on the Mindat website[4]. But what was found at the TRS may be the best expression of crystallized clinochlore yet for Franklin and the vicinity. Obviously, better crystals may have been collected in the past and never reported or never rec-



Clinochlore from Franklin, New Jersey.
Franklin Mineral Museum specimen # 4006.
Photo by Tema J. Hecht.

ognized as being clinochlore. As Yogi Berra might have said on one of his more creative days, "Those are roads best not traveled until they are reached."

Does this find mean that all green phlogopite-like crystals found in this area must be clinochlore? Hardly, but it is something to be taken into consideration if one should ever come across similar material. Perhaps even more importantly, this is an example of why one should not be in a hurry to hang the first name that comes to mind on a discovery that departs even in a small way from the norm. When labeling an unknown mineral, the collector has a responsibility to future generations to note the uncertainty of any identification on the label and the catalog record, and even better there should be a record of what identification techniques were used.

Acknowledgment:

I am indebted to Tony Nikischer and the Hudson Institute for the EDX investigation and subsequent identification of what was initially a misidentified mineral. This report would not exist without it.

References:

1. Mineral News – Vol. 23, No. 8, August 2007.
2. Dunn, Pete – Franklin and Sterling Hill, New Jersey: The World's Most Magnificent Mineral Deposits – Part 4, page 470.
4. Dunn, Pete – Franklin and Sterling Hill, New Jersey: The World's Most Magnificent Mineral Deposits – Part 4, pages 508-510.4. accessed on July 2009.

http://www.mindat.org/photo167412.html

"The Taylor Road Site is owned by the Franklin Mineral Museum. Permission to collect must be granted by Lee Lowell, Museum Collections Manager or Steven Phillips, Museum President."

Reprinted from the July 2009 *Mineral News*.

Unaltered Sterling Hill Willemite

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Every Franklin/Sterling Hill collector knows that, for the most part, willemite from the Franklin Mine generally is green. That from Sterling Hill, on the other hand, has been altered from an original green or gray to red-brown or black. The red-brown is about two-thirds of the original ore body while one third carries black willemite. Later hydrothermal events at Sterling Hill produced clouds of inclusions throughout the willemite grains.

Note that in Figure 1 red-brown willemite contains billows of alteration products. By way of contrast, Figure 2 shows black willemite and generations of black inclusions. These minute inclusions are serpentine, friedelite, manganpyrosmalite, plus red or black franklinite as the primary coloring agent. High zinc franklinite when seen in thin slivers or as inclusions is red, while low zinc franklinite is black.

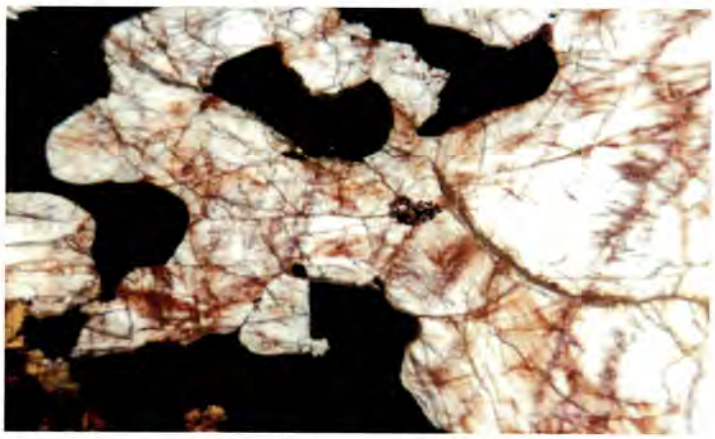

Figure 1. Normal red-brown willemite ore. Grain size is 5-7 mm across.

Photo by Stephen Sanford.

Figure 2. Normal black willemite ore with generations of black inclusions.

Photo by Stephen Sanford.

It is possible that the fluids responsible for this alteration ascended through the Zero Fault. This ancient feature was reactivated several times, both as an initial mylonite (impermeable) layer with interstices that allowed fluid passages to function (Metsger, 1990). An earlier worker likened the secondary layer to that of altered harzburgite, wherein minute inclusions of serpentine and magnetite have formed in olivine.

To summarize: virtually all Sterling Hill willemite ore was altered to red-brown and black.

Around 1990, Dr. Craig Johnson produced several important papers (e.g. Johnson, et al 1990) concerning the temperature at which the protores were deposited. This was accomplished by studying the isotopes of oxygen and carbon.When the abundance of these elements is turned into a ratio, the geothermometry yields a picture of the original metalliferous muds, assuming that this ratio has remained unaffected by later tectonism.

Writing for the Lehigh symposium proceedings, hosted by Lehigh University and the Franklin-Ogdensburg Mineralogical Society, Makovicky and Skinner looked at the alteration of willemite by a series of subsequent hydrothermal fluids. They concluded, in contrast to Johnson, that the isotope ratios must have been upset later by metamorphic (Aleinikof and Volkert (2007)) and hydrothermal events that affected the region over and over again and isotopic data were therefore untrustworthy. They felt that the willemite serpentization represented an alteration of the whole rock including the calcite that supplied the oxygen and carbon. They also stated that no unaffected willemite remained at Sterling Hill.

In 1990 Squiller and Sclar did a chemically exhaustive examination of franklinite. They decided that the grains were isolated and stable under almost all conditions. This, with several exceptions, proved to be true. However, this is not the case of the other ore species. The Geological Specimen (GS) series at the Sterling Hill Mining Museum collection has many examples of extensive movements of elements such as Zn, Mn, Fe under high grade metamorphic conditions.

The Sterling Hill Mining Museum now houses about 30 examples of unaltered Sterling willemite. Thin sections have been prepared from 6 of them. Macroscopically, these pieces are green and orange and yellow; they remain inclusion free microscopically.

If one were to repeat the determination of isotopic ratios, would the result duplicate this data in normal Franklin ore? Or would

they have something more interesting to tell us?

To study or sample the GS collection, please contact Dr. Earl Verbeek at the Sterling Hill Mining Museum. Arrangements will be made for qualified researchers.

References:

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Makovicky, E., Skinner, B.J. (1990) Luminescence and composition studies on primary altered and secondary willemite from the Sterling Hill mineral deposit. Symposium on Character, origin of the Franklin and Sterling Hill ore bodies. Proceeding volume 93-109.Lehigh University, Bethlehem. Pa.

Metsger, R.W., Tennant, C.B., Rodda J.L. (1958) Geochemistry of the Sterling Hill zinc deposit of Sussex county, New Jersey, GSA Bulletin 69, 775-788.

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Collecting at the Franklin Mill Site

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It was back in the early 1990s when Bill Anderson and I collected at the Mill Site. At first we looked on the surface but did not find that much. Once we started digging, our luck changed for the better.

One day when we arrived there, we noticed a bulldozer had made a cut right through the middle of our collecting area. This made it much easier to dig. Soon we started finding so many rocks we had to build a two-man rock cart to get them out.

Over the years we put together a nice collection of fluorescent minerals. It took a lot of hard work but I think it was worth it. We found many big hardystonites, esperites, clinohedrites, axinites, and other rare specimens.

Maybe one day, collectors will get a chance to find this kind of material again. Steven Phillips preserved a lot of it when he moved it over to the Franklin Mineral Museum property.

I will buy what I can't find in the field because I want quality minerals even if they are high-priced, but field collecting is a lot more fun.

Cream of the Fluorescent Mineral Collectors Crop.

Top row l to r: Steve Kuitems, Mark Leger, Claude Poli.

Center row l to r: Fred Lubbers, Mark Boyer.

Front row l to r: Denis DeAngelis, Kurt Hennig.

Photo by Tema J. Hecht.

A RARE MILL SITE MANGANAXINITE

Collected by Claude Poli and Bill Anderson in the early 1990s the red fluorescing mineral in this photo is manganaxinite associated with green fluorescing willemite .

The specimen measures 9 x 5 5/8 inches (23 cm x 14.5 cm). The display face is 8 1/2 x 2 3/4 inches (21 cm x 7 cm)

It weighs 10.6 lbs (4.8 kg).

Claude Poli and Bill Anderson collection.

Photos by Tema J. Hecht