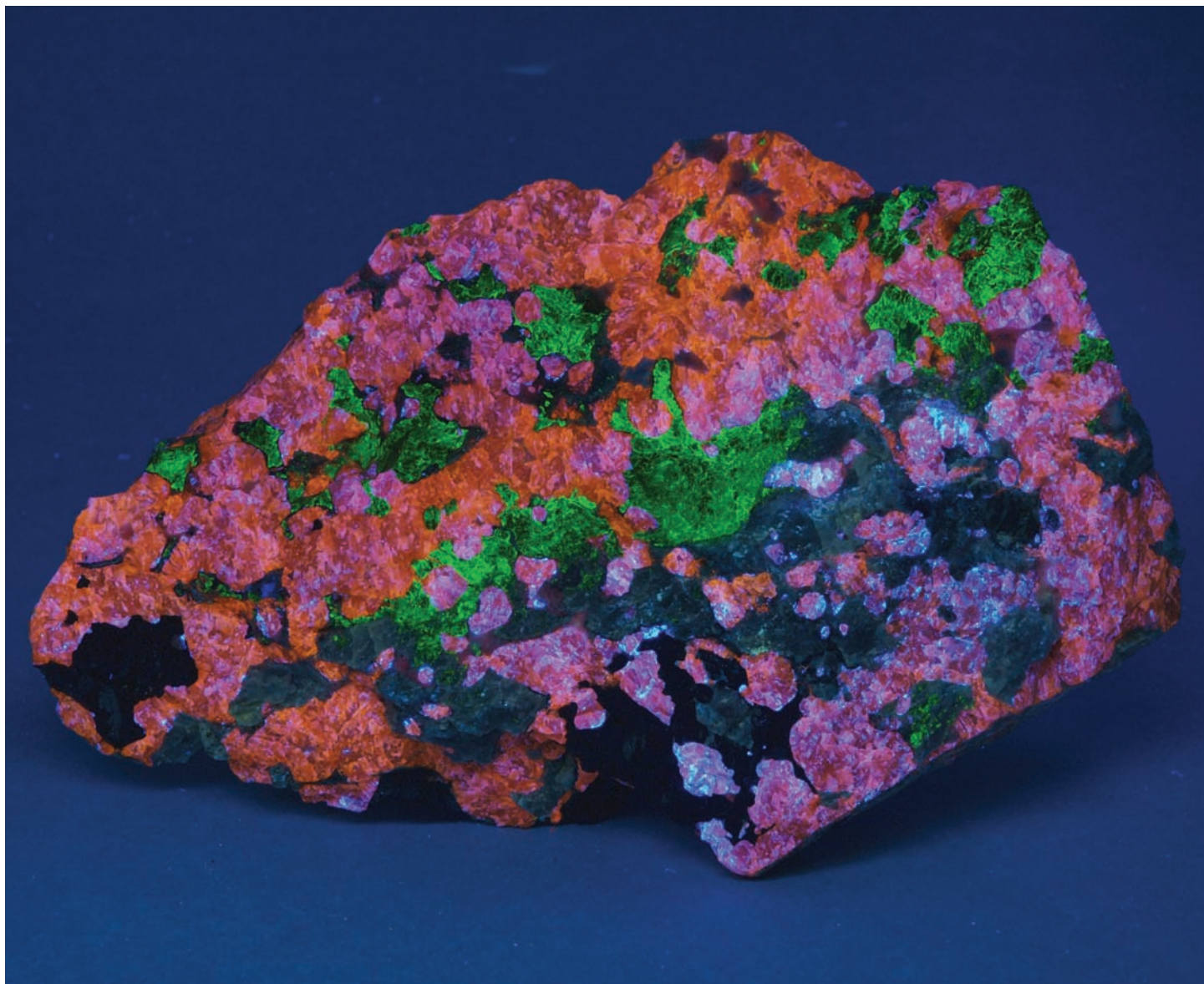


# THE PICKING TABLE

JOURNAL OF THE FRANKLIN-OGDENSBURG MINERALOGICAL SOCIETY

VOL. 55, NO. 1 – SPRING 2014

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- “FOREIGN MINERALS” AT FRANKLIN, NEW JERSEY
- HARDYSTONITE FROM THE DESERT VIEW MINE, CALIFORNIA
- FLUORESCENT GROSSULAR FROM FRANKLIN, NEW JERSEY – AN UPDATE



# THE FRANKLIN-OGDENSBERG MINERALOGICAL SOCIETY, INC.

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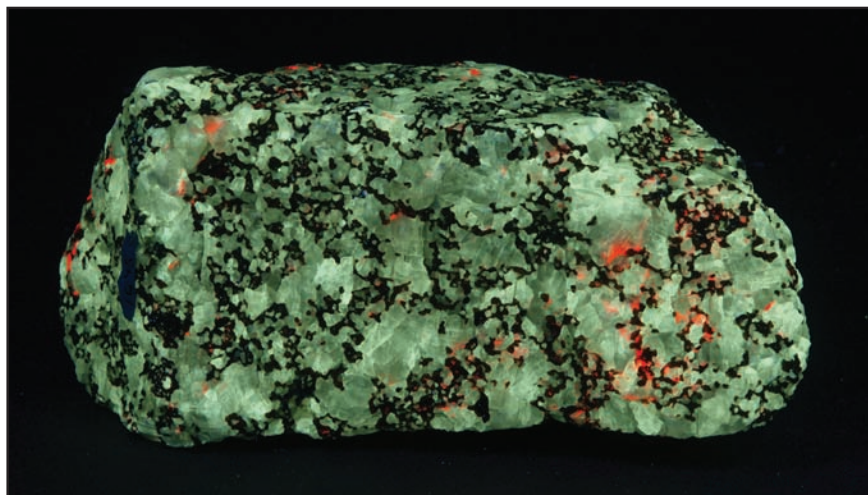
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Program	Mark Dahlman
Swap & Sell	Chester S. Lemanski, Jr.



Franklin barite under shortwave ultraviolet light. Specimen is 5.5" inches (14 cm) long.

# THE PICKING TABLE

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Members are encouraged to submit articles for publication. Articles should be submitted as Microsoft Word documents to Richard J. Keller, Jr. at: [PTMemberFeedback@gmail.com](mailto:PTMemberFeedback@gmail.com).

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## ABOUT THE FRONT COVER

Sphalerite from the North Orebody at Sterling Hill, photographed under combined longwave and shortwave ultraviolet light. The blue to pinkish-blue highlights common to much Sterling Hill sphalerite are well shown in this photograph. The dull bluish-gray-fluorescing mineral below the willemite is talc. This fine example, at one time in the collection of Marian Reitenbaugh of Pottstown, Pennsylvania, measures 8.7 × 5.5 × 2.4 inches (22 × 14 × 6 cm) and is on display as specimen SHMM-60 in the Thomas S. Warren Museum of Fluorescence at Sterling Hill. *Earl R. Verbeek photo.*



# FRANKLIN-OGDENSBURG MINERALOGICAL SOCIETY

## SPRING AND SUMMER 2014 ACTIVITY SCHEDULE

COMPILED BY TEMA J. HECHT

600 WEST 111TH STREET, APT. 11B

NEW YORK, NY 10025

thecht@att.net

### SATURDAY, MARCH 15, 2014

9:00 AM – NOON

#### FOMS 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

#### FOMS Micro Group

Franklin Mineral Museum.

**BYO microscope and minerals.**

**Call Ralph Thomas for information: 215-295-9730.**

1:30 PM – 3:30 PM

#### FOMS Meeting

Franklin Mineral Museum.

Lecture: *NJZ – More Than Just Palmerton – More Than Just Zinc*, by Peter Kern.

### SATURDAY, APRIL 19, 2014

9:00 AM – NOON

#### FOMS 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

#### FOMS Micro Group

Franklin Mineral Museum.

1:30 PM – 3:30 PM

#### FOMS Meeting

Franklin Mineral Museum.

Lecture: *An Overview of Hardrock Mining History With Emphasis on New Jersey*, by Ron Mishkin.

3:30 PM – 4:15 PM

#### MINERAL OF THE MONTH – CUSPIDINE

Bring your specimens of cuspidine for show-and-tell, and a discussion led by Bernard Kozykowski.

### SATURDAY AND SUNDAY, APRIL 26 AND 27, 2014

#### SPRING SHOW WEEKEND

#### 42nd Annual NJESA Gem & Mineral Show

held in conjunction with the

#### 19th Annual FOMS Spring Swap-and-Sell.

Sponsored by the New Jersey Earth Science Association, the Sterling Hill Mining Museum, and FOMS.

Franklin Middle School, Washington St., Franklin, N.J.

NJESA Show hours:

Saturday, 9:00 AM to 5:30 PM; Sunday, 10:00 AM to 5:00 PM.

Swap-and-Sell hours:

Saturday, 8:00 AM to 5:30 PM; Sunday, 9:00 AM to 5:00 PM.

Admission \$5.00 per person,

children under 14 free with paying adult.

For Swap-and-Sell information,

contact Chet Lemanski after 8:00 PM at 609-893-7366.

#### BANQUET AND AUCTION

Saturday evening at the GeoTech Center, Sterling Hill Mining Museum.

Admission limited to 60 people.

Social hour from 5:30 PM to 6:30 PM,

followed by an all-you-can-eat buffet from 6:30 PM to 9:30 PM.

Banquet tickets are \$20.00 each

and include all food, coffee, tea, and soft drinks. **BYOB!!**

Silent auction from 5:30 PM to 7:30 PM.

Live auction begins 7:45 PM.

Both auctions are for the benefit of all three show sponsors:

NJESA, FOMS, and SHMM.

#### \*\*FIELD COLLECTING: SUPER DIG

Sterling Hill Mining Museum.

Organized by the Delaware Valley Earth Science Society.

**!!!! SCHEDULE: SATURDAY, 9:00 AM – 11:00 PM !!!!**

\$20.00 per person includes extended mine tour and registration.

\$1.50 per pound for material collected.

Preregistration required;

see <http://www.uvworld.org> for more information.

**\*\*Sterling Hill Mining Museum, Saturday and Sunday.**

Garage Sale: Christiansen Pavilion, 10:00 AM to 3:00 PM.

**\*\*Sterling Hill Mining Museum, Sunday only.**

Collecting on the Mine Run dump and in the Fill quarry, Passaic pit, and “Saddle” area.

**9:00 AM – 3:00 PM (OPEN TO THE PUBLIC!)**

Fees for mineral collecting: \$5.00 admission plus \$1.50/lb for all material taken.

### SUNDAY, MAY 4, 2014

NOON

**\*\*Annual Volunteer Appreciation and Miners Day Tribute**

at the Franklin Mineral Museum, including special events and a concert by the famous Franklin Band.

### SATURDAY, MAY 17, 2014

9:00 AM – NOON

**FOMS Field Trip**

Collecting at Hamburg quarry, Eastern Concrete Materials, Inc.

Meet at the scale house to sign releases.

Hard hats, leather shoes (preferably steel tipped), gloves and glasses required.

**Weight per specimen limited to 25 lbs.**

**Bulk collecting/loading of specimens is prohibited.**

10:00 AM – NOON

**FOMS Micro Group**

Franklin Mineral Museum.

1:30 PM – 3:30 PM

**FOMS Meeting**

Franklin Mineral Museum.

Lecture: *Collecting the Franklin Mining District*, by Steven Kuitems, DMD.

### SUNDAY, MAY 25, 2014

**\*\*Sterling Hill Mining Museum**

Collecting on the Mine Run dump and in the Fill quarry, Passaic pit, and “Saddle” area.

**9:00 AM – 3:00 PM (OPEN TO THE PUBLIC!)**

Fees for mineral collecting: \$5.00 admission plus \$1.50/lb for all material taken.

### SATURDAY, JUNE 7, 2014

7:00 PM – 10:00 PM

**\*\*Spring Night Dig and Mineral Sale**

Sponsored by the Franklin Mineral Museum.

Open to the public – poundage fee charged.

Eye protection, flashlight, and UV lamp advised.

For more information, call: 973-827-3481.

### SATURDAY, JUNE 21, 2014

9:00 AM – NOON

**FOMS Field Trip**

Collecting at the Braen quarry

(a.k.a. Franklin quarry), Cork Hill Road, Franklin, N.J.

If gate is open, drive through and park to the left of the gate.

Please don't block the roadway.

10:00 AM – NOON

**FOMS Micro Group**

Franklin Mineral Museum.

1:30 PM – 3:30 PM

**FOMS Meeting**

Franklin Mineral Museum.

Lecture: *World's Best Agate Collection*, by John Sanfaçon.

6:00 PM – 10:00 PM

**\*\*Night Collecting at the Sterling Hill Mining Museum**

Night Collecting on the Mine Run dump and in the Passaic pit and “saddle” areas.

Fees for mineral collecting: \$5.00 admission plus \$1.50/lb for all material taken.

Eye protection, flashlight, hammer (carpenter's claw hammers not allowed), and UV lamp advised.

**(Open to Sterling Hill Mining Museum members only)**

### JUNE 29, 2014

**\*\*Sterling Hill Mining Museum**

Collecting on the Mine Run dump and in the Fill quarry, Passaic pit, and “Saddle” area.

**9:00 AM – 3:00 PM (OPEN TO THE PUBLIC!)**

Fees for mineral collecting: \$5.00 admission plus \$1.50/lb for all material taken.

✕ ✕ ✕ ✕ ✕ ✕ ✕ ✕ ✕ ✕ ✕

Scheduled activities of the FOMS include meetings, field trips, and other events.

Regular meetings are held on the third Saturdays of March, April, May, June, September, October, and November, and generally comprise a business session followed by a lecture. FOMS meetings are open to the public, and are held at 1:30 PM, usually in Kraissl Hall at the Franklin Mineral Museum, Evans St., Franklin, N.J. (check listings for exceptions).

Most FOMS field trips are open only to FOMS members aged 13 or older. Proper field trip gear required: hard hat, protective eyewear, gloves, sturdy shoes. **\*\*Activities so marked are not FOMS 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.

# President's Message

---

**JAMES VAN FLEET**  
222 MARKET STREET  
MIFFLINBURG, PA 17844  
vanfleet@bucknell.edu

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As this issue of *The Picking Table* reaches our members, we will be well into our spring activities: club-sponsored digs, the NJESA Gem & Mineral Show and the FOMS Spring Swap-and-Sell, and meetings at the Franklin Mineral Museum. This year, we are also going to roll out some activities online. These will benefit all of our members, near and far. First and foremost will be a website dedicated to the Franklin-Ogdensburg Mineralogical Society. The URL Web address is <http://fomsnj.wordpress.com>.

The Franklin Mineral Museum and the Sterling Hill Mining Museum already have well-developed and interesting websites. They highlight the many activities, events, and services of the area museums. The FOMS website will be a little different.

Our intent is to better communicate with our members, and document both what we have done, and what we are planning next. I have had requests from members who would like to benefit from our monthly meetings and guest speakers, even when they can't attend in person. One possibility would be to post videos of our speaker presentations, and another would be to post past issues of *The Picking Table* online for all to read.

It's an ambitious project, and one which will take time to develop, but we have taken the first steps, and I hope we will be getting some constructive feedback from our members. Remember, you can communicate with us via the FOMS e-mail address: [fomsnj@gmail.com](mailto:fomsnj@gmail.com). ✕

## From the Editor's Desk

---

**RICHARD J. KELLER, JR.**  
13 GREEN STREET  
FRANKLIN, NJ 07416  
[FranklinNJ@hotmail.com](mailto:FranklinNJ@hotmail.com)

---

I can't imagine anyone could be more excited than I am to welcome the springtime, and thus say "goodbye and good riddance" to the winter of 2013-2014.

We, the editors of *The Picking Table*, are pretty excited about the issue you are now holding. It's not the longest issue we've created, but it contains some ground-breaking material. I need only refer you to the back cover to prove that: This may be the first time a color photograph of a mineral fluorescing under the iron arc spark has been published. The hardystonite article will educate you about something you may have never expected to see about a long-beloved Franklin, N.J., fluorescent staple in virtually everyone's collection. I refer back to a statement I believe I made several years ago about Franklin minerals: "Just when you say it can't happen..." (If I didn't say that, I should have.) Confirmation of this discovery warranted two independent sets of scientific analysis, and the time was taken to obtain them.

FOMS has made a boatload of forward steps in terms of Internet-based goodies, member meeting advances, photographic firsts, and membership perks. More detail is

provided above in our president's message. We are quite excited to share all of this with you.

Our FOMS members page on Facebook has continued to grow, but not every one of those persons is a current member of the society. So I plan to try to push membership on those folks.

On the subject of Facebook, I IMPLORE you to check our member's page regularly as changes are imminent. An example of a potential change would be a newly added geology-based field trip hosted by Earl Verbeek. Several years ago we had a highly successful one-off field trip to the McAfee area of Sussex County that focused on stromatolites, oolites, breccia dikes, and the Hardyston unconformity. If memory serves me correctly, we had more attendees at that field trip than any collecting trips we've had in years! If that isn't a ringing endorsement to have another geological trip, I don't know what is.

So sit back and enjoy this Spring 2014 issue of *The Picking Table*. ✕

# Happenings at Sterling Hill

**WILLIAM KROTH**

PRESIDENT, STERLING HILL MINING MUSEUM  
30 PLANT STREET  
OGDENSBURG, NJ 07439

This spring brings more new improvements and attractions to the Sterling Hill Mining Museum. An enhanced safety effort has taken place, with all aspects of the tour route being examined by a certified mining professional. His findings and recommendations have been implemented by our staff Safety Engineer, John Gumbs. Work performed within the mine included completely sounding and scaling all exposed rock, installing steel struts under key areas such as the ore pass bridge, power-washing all pipes and exposed mine walls, and installing new fencing. Outside areas, such as the entrance to the Edison Tunnel, received heavy timber overhead shielding to protect from ice and possible falling rock. Finally, for the safety of our visitors as well as staff, we have purchased an automatic electronic defibrillator, and our staff is presently being trained in its use. We are very proud of our safety record, and these measures will continue to uphold our great reputation.

We have just purchased two major local mineral collections, both of which may be seen in the Zobel Exhibit Hall. The first collection was assembled by local collector and Sterling Hill tour guide Ray Latawec. It consists of 293 “banded” specimens that he collected over the past 25 years. The combinations of colors and twisting veins are truly amazing and tell an intriguing story about their formation. Specimens range from apple green willemite to golden manganberzeliite.

Our second collection consists of 548 cataloged specimens and 300 uncataloged pieces assembled by ex-Sterling Hill miner John Kolic. John became interested in geology in the late 1960s and started his mineral collecting on rock cuts made for Route 80 in New Jersey. In the early 1970s, he got his first job as a miner at Sterling Hill and worked here until its closing in 1986. During this time, John was instrumental in bringing out many rare and new species and even has the mineral kolicite named after him. Many of the specimens in this collection were personally collected by John; however, the collection is also very rich in Franklin fluorescent minerals and the lead silicate species. Additionally, John was also kind enough to donate 250 flats and boxes full of uncataloged specimens that will keep us busy for many years to come as we use our new X-ray diffraction equipment (donated by Tony Nikischer of Excalibur Minerals) to identify many of the “unknowns.”

When you are in the area, please stop by the Sterling Hill Mining Museum and we will be glad to show you our improvements and additions. ✂

## STILL AVAILABLE!

(While Supplies Last)

The first 50 Years of  
*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 pages have been scanned from ORIGINAL issues of the *PT* dating from February 1960 through Spring 2009.

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 \$35.00, plus \$5.00 shipping.

Personal checks should be made payable to “FOMS” and mailed to Denise Kroth at:

240 Union Ave., Wood-Ridge, NJ 07075.

Technical support is provided by Richard Keller (e-mail: [PTMemberFeedback@gmail.com](mailto:PTMemberFeedback@gmail.com)).

# The 57th Annual Franklin-Sterling Gem & Mineral Show

SEPTEMBER 28 AND 29, 2013

STEVEN M. KUITEMS, DMD

14 FOX HOLLOW TRAIL  
BERNARDSVILLE, NJ 07924

Our specimens were packed and loaded, and we had the usual struggle with Friday rush hour traffic, but the weather was great and we arrived at the Franklin School in good time, eager to set up. Then came “The Wait,” as set-up time was later than in previous years. Finally the gates and doors opened for exhibitors and indoor vendors, and work began in earnest. The “white light” display cases in the hallway had been refurbished with a simplified and more secure lighting system and the fluorescent mineral cases were outfitted with more powerful UV lamps, ready for this year’s delightful array of specimens from the Franklin mining district.

One of the rewards of this annual event is the look of surprise on the faces of the public when they see the exotic and often colorful mineral treasures of the Franklin and Sterling Hill area. It’s our job as exhibitors to dispel misconceptions about “The Fluorescent Mineral Capital of the World” among show-goers, some of whom may have negative impressions from seeing a lot of gray and black rocks on the mineral dumps and in local basements. This is the show for changing people’s minds about what is really in their backyards. Let’s just say that there were nine cases of fine daylight minerals and nine cases of minerals whose beauty is revealed only by UV. Viewers were not disappointed.

Leading the daylight exhibits was Dick Hauck’s case, “Historic Mineral Collections.” Most of these were in compartmented boxes, beginners’ collections given by a teacher or a kind parent to stimulate interest in the hobby. For many of us, seeing these was truly a walk down memory lane. Mark Mayfield showed both old and new collectors what could be found on the local mine dumps with his case of personally collected miniature specimens, “Down in the Dumps.” The author had put together two cases of “Franklin Classics,” specifically, willemite specimens from thumbnail size to large cabinet size. John Kolic, the quintessential Sterling Hill miner, presented a range of classic and rare mineral species, many personally collected, titled “Franklin and Ogdensburg.” For fanciers of larger specimens, Mark Boyer’s case of “Willemite Delights” was a treat for the eyes, showing a wide range of colors for this locally abundant zinc silicate, which incidentally reaches its finest development here. “Color” was the theme



Two “Franklin Friends” who have made numerous trips down from Maine to participate in the bi-annual Franklin shows: Clay Carkin and Patrick Bigos of the Maine Mineralogical and Geological Society. *Tema Hecht photo.*

of the Phamily Minerals case, including bright red zincite, purple sussexite, pink friedelite, and of course, vividly green willemite. Steve Sanford’s case, “Geology: a Potpourri,” was colorful in its own right but required one to pause, read the labels, and think about each specimen to appreciate it fully.

For maximum visual impact, visitors had to go to the curtained-off auditorium, the Dark Side of the school, where they let their eyes adjust to appreciate the stunning colors of the fluorescent mineral exhibits. The Franklin Mineral Museum had a selection of “Seldom Seen Franklin Fluorescents,” including eye-poppers like the largest solid grain of powellite from the district, a very fine johnbaumite, an extraordinary ring-shaped group of scheelite grains, and the brightest green-fluorescing quartz the author can recall seeing. The Sterling Hill Mining Museum’s case was titled “Fluorescence in Art,” not just lapidary art in the form of cabochons and spheres of fluorescent minerals, but also pictures made with fluorescing grains of local minerals instead of conventional pigments. The author had assembled a case of “Franklin Delights,” which as its name suggests consisted of fluorescent specimens selected to delight all viewers. Several unusual pieces, including a yellow-fluorescing willemite, a bright-orange-fluorescing





A collection of collections: Richard Hauck's boxed sets of minerals from decades past. Such kits started many of us on the road to perdition. *Tema Hecht photo.*

johnbaumite, and a large larsenite specimen with coatings of tiny blue-fluorescing willemite crystals, had never before been publicly exhibited. Claude Poli's case, "Franklin Forever," had as its centerpieces an especially fine radiating willemite and a stunning example of violet-fluorescing crystal sections of hardystonite in red-fluorescing calcite. "Look What I Found" was Andrew K. Mackey's selection of three-color and four-color specimens that included clinohedrite, hardystonite, esperite, willemite, wollastonite, and calcite. On the theme of hardystonite, Rich Keller's case, humorously titled "Hardy Har Har," had a notable selection of that peculiar violet-fluorescing zinc silicate, named for Hardyston Township, which is now hard to find on Franklin's mineral dumps. It always made a collector's day to find a piece accompanied by orange-fluorescing clinohedrite.

Also in the dark was "Franklin Firepower," a spectacular display of large, visually stunning specimens selected by Mark Boyer. It's still amazing how shortwave ultraviolet energy can transform dull-by-daylight lumps of rock into "firepower"—the brilliant orange-yellow of cuspidine, the bright white of barite and the electric blue of margarosanite, the spectacular

crimson of a Mill Site bustamite! On the longer side of the UV spectrum, Chris Luzier's case displayed "Stellar Sphalerite" using powerful longwave lamps to charge up his specimens. An amazing thing about sphalerite is that this one species can have five or six different fluorescent hues, with three or four on the same piece. The most unconventional exhibit, and I do mean that as a compliment, was the case named "Suspended Willimation," assembled by Ken St. John. It was uniquely constructed of fairly large willemite-and-calcite specimens (very bright, mind you) suspended by wires in a vertically oriented case, so viewers had the impression of heavy zinc-bearing rocks magically floating in space. Like many visitors, I found myself first staring at the display, then admiring the cleverness of its concept and execution.

This was truly a fine show. I am glad I did not miss it, and for many visitors it was an eye-opening experience. Wouldn't you, dear reader, like to be part of this fine group and exhibit at next year's show? Why not contact Pat Seger and Steven Phillips, coordinators of the daylight exhibits, or Richard Bostwick, the fluorescent exhibit coordinator, and be a participant at the 58th Annual Franklin-Sterling Gem & Mineral Show?



Sterling Hill's exhibit showing the versatility of fluorescent minerals. Examples in this photo are cut and polished cabochons and fluorescent sand paintings. Tema Hecht photo.



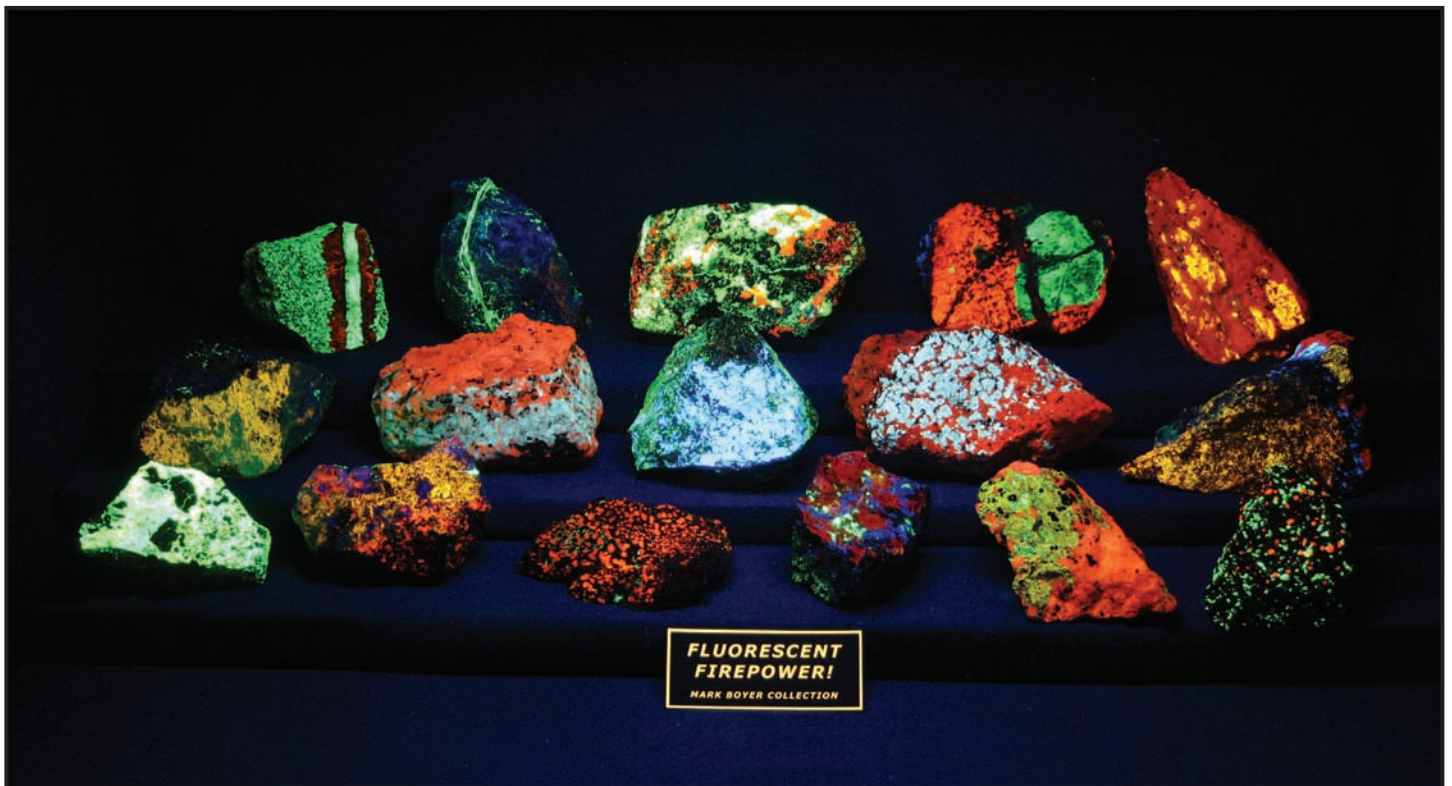
This is not nearly as strange in Franklin as it might appear anywhere else. Tema Hecht photo.



Vandall King (right) and his son Nathan at their photo rig, offering their professional photographic services at the show. Mark Boyer photo.



A familiar sight at our local shows: volunteers at the FOMS table, ready to help attendees become members, obtain back issues of *The Picking Table*, purchase T-shirts, etc. Left to right, Anne Wronka, Nina Kulsar, Rich Keller, Jim Van Fleet, and Ken St. John. *Mark Boyer photo.*



Mark Boyer's fluorescent mineral display showing colors, contrasts, patterns, assemblages, veins, etc. *Mark Boyer photo.* ✂

# “Foreign Minerals” at Franklin, New Jersey

JOHN L. BAUM

(1916 – 2011)

RESIDENT GEOLOGIST, NEW JERSEY ZINC COMPANY

CURATOR, FRANKLIN MINERAL MUSEUM

From time immemorial, strange objects have been showing up in strange places. There come to mind the overalls in Mrs. Murphy’s chowder or the pussycats and long-tailed rats in Dunderbeck’s sausage machine.\* In the Franklin, N.J., mining district, the mineral enthusiast similarly encounters what the parochial collector calls “foreign minerals,” i.e., anything but Franklin-Sterling mineral specimens. Some of these observed over a half century by one collector are mentioned herewith.

Because the Franklin plant was the site of mineral studies undertaken in three laboratories to assist the New Jersey Zinc Company operations worldwide for many years, ores from diverse localities were routinely sent there for study. Analyses could be made in such detail that outside interests depended upon them, and experiments in mineral beneficiation were undertaken to aid mills here and elsewhere to plan grinding and concentration methods. Nothing was too strange to attempt—Lawson H. “Duke” Bauer once undertook to separate the hulls from ground mustard by flotation in response to a casual remark by a visiting spice processor. Challenge was all the lab people needed, and they regularly turned out their own brand of poison ivy lotion for the local Company geologists. It was very effective.

Common in the laboratories were ores from Austinville, Virginia; Friedensville, Pennsylvania; Hanover, New Mexico; and Gilman, Colorado. The first two produced sphalerite in gray dolomite limestone, that at Austinville replacing a reef structure with some galena, while the Friedensville sphalerite was similar but lacking in galena. Hanover and Gilman produced dark sphalerite, well crystallized at Gilman, which was a great pyrite locality. It is Gilman pyrite that might turn up in Franklin material because eastern visitors admired it and samples were abundant in both the chemistry and geology laboratories, the latter being in the basement of the Company’s Franklin main office. Gilman pyrite came in both octahedra and pyritohedra, without matrix.

At one time, a load of Willsboro, N.Y., wollastonite ore was dumped at the base of the Franklin headframe. It resembled almost if not exactly the least-fluorescent, fine-grained Sterling

Mine wollastonite exposed in a crosscut on 900 level. This pile disappeared in short order, either cleaned up or cleaned out.

A quantity of Allard Lake, Quebec, titanium ore—chunky, black, heavy stuff resembling magnetite—was around for a while at Franklin. It was ilmenite with minute hematite lamellae, and it has been sold with accompanying Lucite-mounted polished sections at the Franklin Mineral Museum.

In the early 1900s, a shipment of Brazilian monazite sand was sent to Franklin for study and was ultimately stored in part in a Company warehouse, the remainder being dumped in the northeastern end of the Ball’s Hill magnetite iron workings. It is reasonably radioactive, an orange-brown sand, and may one day be rediscovered to delight the environmentalists with a new cause. A concrete floor was poured in the warehouse over the stored sand, and anyone with the proper equipment can detect the two piles beneath the concrete slab behind the Franklin phone exchange.

L.H. Bauer supplied Palache at Harvard with numerous Franklin-Sterling specimens, to acquire some of which he traded miners various specimens as available. Agates seemed to be most acceptable but other minerals were traded, and of course Harvard was not the only trader around. Native gold was frequently asked for and infrequently supplied, but there is “foreign” gold in Franklin collections listed as coming from the Franklin Mine. The matrix is limonite in two such specimens, one of them with altered pyrite crystals. Large cahnite crystals also were obtained by Bauer using trade goods.

The Buckwheat dump has been a great place for lost-and-found specimens. Petrified wood, arrowheads, western ores, glacial debris, and other transported treasures have had their rebirth there. For many years, dealers operated out of their cars, and bags used elsewhere have been upended by collectors to be filled there.

The above are sources of “foreign minerals” and the ways in which they came to rest at Franklin. There are undoubtedly others as well.

—John L. Baum, Aug. 13, 1989 ✂

\* Editor’s note: Jack Baum was referring to the songs “Who Threw the Overalls in Mrs. Murphy’s Chowder?” and “Dunderbeck’s Machine.”

# The Fluorescent Mineral Society's Big NERF Ball

**HOWARD GREEN**

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JERICHO, NY 11753

The Northeast Region Fluoresophiles (NERF) of the Fluorescent Mineral Society (FMS) held their annual autumn ball on November 9, 2013, at the GeoTech Center of the Sterling Hill Mining Museum (SHMM). Meeting attendance has grown over the years, and this year the room was stretched almost to capacity by 80 folks from as far as Virginia and Maine. The roster of attendees certainly had a polyglot feel, with FMS members also affiliated with FOMS, the Franklin Mineral Museum, SHMM, the Morris Museum, the Gregory Museum on Long Island, and with other clubs such as the North Jersey Mineralogical Society (NoJMS), the Rock and Mineral Club of Lower Bucks County, the Delaware Mineralogical Society, the Delaware Valley Earth Science Society (DVESS), the Philadelphia Mineralogical Society, the (Long) Island Rock Hounds, the New York Mineralogical Club, the Suffolk (Long Island) Gem and Mineral Club, the Mid-Hudson Valley Gem & Mineral Society, the Danbury Mineralogical Society, and the Bay Area (San Francisco) Mineral Club, to name a few.

Our meetings have evolved into scientific symposia with expert discussants from around the world, and an all-day mineral schmooze/show-and-tell/sell/trade-a-thon extravaganza. In addition, the infamous NERF Lunch Players perform ever more amazing culinary magic each year. The more structured part of the program is formatted to include topics relating to specific properties of fluorescent minerals, reports on collecting sites and trips taken by members, discussions and display of a featured fluorescent mineral, and explorations into the effects of visible and ultraviolet (UV) light on biological systems. FMS members present topics in their field of interest, and we also have expert presenters to give talks, either in person or (through the effort of NERF vice president Lee McIlvaine) by remote audiovisual hookup. This same technology has enabled us to present our program to FMS members from as distant as Florida and Washington. Our hope is to eventually share interactive meetings simultaneously with other FMS chapter meetings. In the meantime, detailed meeting reports that chronicle the essence of the scientific portion of the meetings are available as online supplements to the FMS newsletter, *UV Waves*.

Dr. Daniel Yarosh threw out the first NERF ball at the 2013 meeting. Dan is the Senior Vice President of Basic Science Research at Estée Lauder. In addition to his many



Howie Green, about to illuminate us all at a meeting of the Fluorescent Mineral Society. The high-powered transilluminator below his right hand should help. *Tema Hecht photo.*

other accomplishments, Dan has pioneered the discovery of a transdermally absorbed DNA-repair lotion that may reduce the incidence of skin cancers induced by the action of UV light. Dan succeeded in scaring the wits out of us by describing the pathophysiology of DNA damage caused by UV light, even longwave. In addition, he informed us of the frightening cumulative deterioration of our DNA-repair capability with continued UV exposure. The take-home lesson was the need for protection from UV light. Audience discussion included the effects of UV (and even visible blue) light on cataract formation, macular degeneration, and the triggering of autoimmune illness.

Dr. Mark Weller spoke with us from his lab at the University of Bath in England, where he is the Chair of Energy Materials in the Department of Chemistry. Mark is a giant in the field of inorganic chemistry, being the Chairman of the Solid State Group of the Royal Society of Chemistry and the lead co-author of Oxford University Press's *Inorganic Chemistry*. But most importantly for our purposes, Mark is a member of "Team Greenland." Mark's talk focused on the mechanism of fluorescence and tenebrescence in tugtupite and sodalite (hackmanite). A "live" demonstration including dramatic examples of these minerals from Greenland, Afghanistan, Canada, and Russia accompanied Mark's talk.



Participants from afar as they appeared on-screen during the FMS meeting: Don Newsome (Washington), Flint Carter (Arizona), Herb Yeates (Florida), and Mark Cole (Tennessee). *Tema Hecht photo.*

During lunch, I displayed a suite of rocks containing a particularly spectacular assemblage of fluorescent minerals from Greenland, including tugtupite, chkalovite, sodalite, polyolithionite, natrolite, and analcime. In the service of reliability in communication, these amazing rocks have been nicknamed “Ultamite—the last rock you’ll ever need.” Parenthetically, for this meeting we introduced as a backup plan one of the most powerful lunch-money collection techniques devised to date. In this alternate method, if there is poor compliance with our request for a \$10 voluntary contribution, the food is poisoned and we charge \$10 for the antidote.

After recess, we returned to the days of yesteryear through the narrative of mining expert and raconteur extraordinaire Flint Carter (<http://emol.org/flintcarter/index.html>). Flint related the history of the Campo Benito Mines of Oracle, Arizona; their owner Buffalo Bill Cody; and Cody’s friend and tungsten customer, Thomas A. Edison. Next, Lee McIlvaine presented a travelogue of Team Greenland’s collecting trips to Oracle, followed by a show-and-tell of scheelite/calcite (but not fluorescent scorpions) collected there.

For this year’s meeting, we reinstated the popular My Favorite Rock segment. Former FOMS president (and in the

interest of full disclosure, *PT* editor) Rich Keller elbowed everyone out of the way to my newly reconfigured 240-watt shortwave UV transilluminator. If Dan Yarosh had stayed, he would’ve probably become cataleptic. The two dazzlers Rich showed were his very first self-collected hardystonite and a spectacular specimen of four hardystonite “eyes,” each rimmed with orange-fluorescing clinohedrite in a shiny mass of franklinite situated on a fracture face of apple green (and blindingly bright) willemite with leucophoenicite and dozens of small inclusions of pristine native copper. Next, I told the story of my “fave,” a volleyball-size combination of calcite, svabite, and johnbaumite, which fluoresces red, gold, and lavender, respectively. What makes this rock special is that I was five feet away when it was discovered at the Jakobsberg Mine dump in Nordmark, Sweden, through the imaginative and intense labor of FOMS vice president Pat Hintz. Ironically, our Team Greenland colleague and Långban guide, Ingulf Flamborn, subsequently showed me a smaller but no less beautiful example that he found in the same hole at “The Jake” a month before Pat’s arrival. For a not-nominal fee, Pat or I will give anyone who wishes the GPS coordinates for this hole. Last but not least, Lee McIlvaine described (one of



Lee McIlvaine prepping the Web meeting which allowed for others across the country to participate in the lectures in real-time. *Tema Hecht photo.*



Give me your tired, your poor, your huddled masses...well, here they are! Attendees listen to a presentation at the November 2013 meeting of the Fluorescent Mineral Society. *Tema Hecht photo.*



Herb Kropnick capturing the spirit of a fluorescence-themed meeting. *Tema Hecht photo.*

his lifelong quest(s) to find an example of tan-fluorescing Peruvian selenite (common) on a matrix of orange-fluorescing halite (almost unique), which I literally stumbled upon and purchased while browsing in Tucson. To be fair, Lee was distracted at that point by his search for an engagement ring for his girlfriend, Charlotte. Jim Van Fleet, FOMS president, closed the formal program by describing his efforts in the difficult task of accurate identification of the arsenate apatites svabite and johnbaumite from Sweden.

As judged by the incredible volume and quality of the rocks that changed hands, the swap-and-sell this year was an unprecedented success. This can be credited to several factors, one of which is the soundproofing that insulates the presentation room from the trading venue to permit continuous selling there. In addition, apparently my skill as a tumbler has evolved after many years of concerted effort.

Tentative topics for our next meeting include presentations detailing color enhancement techniques for gemstones, a neuroimaging study of the physiological changes that occur at the moment that a rock collector obtains a coveted specimen, a site report on collecting fluorescent minerals at Dara-i-Pioz in Tajikstan, and a how-to on the nuts and bolts of building field and display UV lamps. As always, members are encouraged to submit to me requests to present a talk, or of ideas on desired topics. ✂

# An Ewald Gerstmann Story

## Dear to My Heart

**RAY LATAWIEC**  
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Well, there I was, circa 1977, a novice collector at the Gerstmann Mineral Museum, full of vigor and eager to get anything from the area—anything, even the stuff usually referred to as “leaverites.” On the side of the museum, next to the propane tank, was a little area where Ewald would throw chips and junk from his trimmings. These “worthless” pieces were of interest to me as a neophyte in the Franklin area.

Now, all those familiar with the Gerstmann museum knew that the “men’s room” was a bucket behind a curtain where Warren Miller had his fluorescent collection. Fill up the bucket and spill it out by the propane tank to “flush” it.

One day while I was collecting chips of “leaverite,” a figure emerged from around the corner, and a bucket was flung at me—the contents of which hit me square in the torso. Ewald had just “flushed the toilet” from the men’s room! Wide-eyed and laughing, Ewald told me, “Don’t worry, piss makes the rocks look better.” Then, to make everything okay, he said, “Here’s a coupla bucks—go get some coffee!” ☒

### The Sterling Hill Mining Museum, Inc.



30 Plant Street, Ogdensburg, NJ 07439

Museum phone: 973-209-7212

Fax: 973-209-8505

Web: [sterlinghillminingmuseum.org](http://sterlinghillminingmuseum.org)  
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Contact the mine office for details.



#### Schedule of operation:

April 1 through November 30, Museum store is open 7 days a week, 10:00 AM to 3:00 PM. General public tours at 1:00 PM. Group tours may be scheduled by appointment at other times during the day.

December 1 through March 31, **WEEKENDS** - Museum store is open 10:00 AM to 3:30 PM and general public tours are at 1:00 PM (weather permitting). Group tours may be scheduled during weekdays by appointment (weather permitting). Please call if you have any questions.

In April, May, June, September, October, and November, tours at 1:00 PM or by appointment.

The temperature in the mine is 56°F.



# Hardystonite From the Desert View Mine, California

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## INTRODUCTION

In late December of 2012, Kevin Brady, an accomplished and knowledgeable field collector of minerals, sent to one of us (ERV) a specimen of an unknown mineral that he noted fluoresced deep violet under shortwave (SW) ultraviolet light and thus resembled hardystonite. Inasmuch as the locality for this specimen—the Desert View Mine, in California—has also produced several other minerals common at Franklin, N.J., but rare elsewhere, Mr. Brady's hopeful guess as to the mineral's identity had merit. Repeated X-ray scans and chemical analysis proved him correct. Hardystonite is thus removed from the list of minerals unique to Franklin.

## LOCALITY DESCRIPTION

The Desert View Mine is in the San Bernardino Mountains of California, about 3 miles (5 km) northwest of the town of Fawnskin. Specimens from the locality often are labeled "Holcomb Valley" after the valley that drains the area about 1.25 miles (2 km) south of the mine site. The small mineral deposit exposed at the Desert View Mine site is hosted by Paleozoic marble that formed as Mesozoic granodiorites intruded the region and thermally metamorphosed the original sedimentary carbonate rocks (Miller et al., 2001). As described by Leavens and Patton (2008), the marble is part of a small roof pendant\* only a few hundred yards across, both underlain and surrounded by granodiorite. The mine itself is a small one, consisting of an adit about 50 feet (15 m) long, small dumps, and minor surface workings.

The Desert View Mine has for years been popular among collectors of fluorescent minerals and has produced attractive specimens of willemite (fl. green), calcite (fl. red), and wollastonite (fl. yellow). In addition to these three minerals, franklinite, zincite, and hetaerolite also occur at the Desert

View Mine and further strengthen its mineralogical similarities to Franklin. Although much of the original geology has been obliterated by intrusion of the granodiorite, Leavens and Patton (2008) provided mineralogical and geochemical evidence that the Desert View deposit, like that at Franklin, is exhalative, and that it is genetically intermediate between the Franklin-Sterling Hill deposits and those at Långban, Sweden.

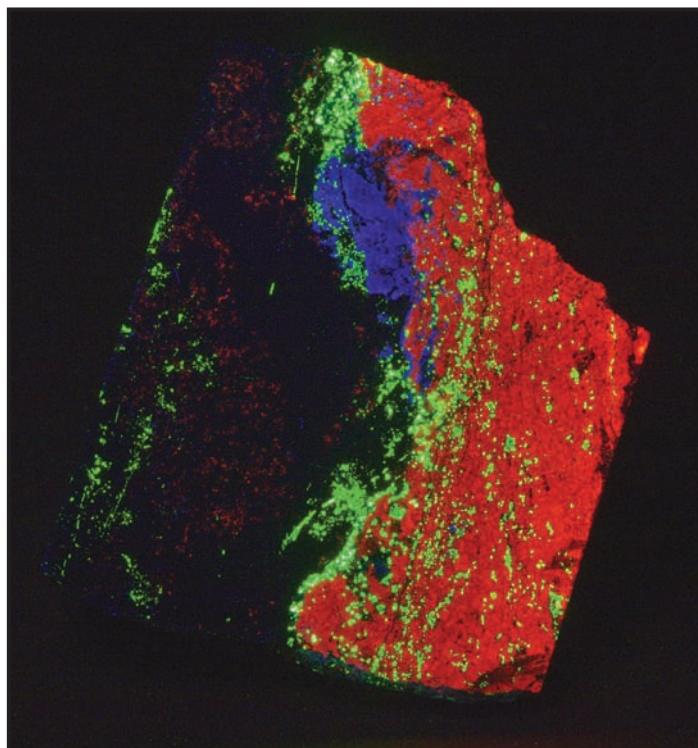
## SPECIMEN DESCRIPTION

The specimen sent to us for analysis is fine-grained, dark, and sawn on three sides (Fig. 1). Mr. Brady indicated that it is a trim piece from a much larger mass, collected many years ago, that was being prepared for grinding into a sphere. Visually the specimen is divisible into three parts: (1) a medium-gray mass of calcite (average grain size about 1 mm) and subordinate willemite, both obvious from their fluorescence; (2) a nearly black mass whose mineralogic composition is not visually evident owing to fine grain size; and (3) an irregular, dark brown contact zone between these two. The hardystonite (Fig. 2) occurs within the contact zone and appears on both a naturally broken and sawn surface of the specimen; on both surfaces it forms an elongated bleb about 0.7" (2 cm) long and 0.2" (0.5 cm) thick. Willemite in the calcite mass is concentrated near the contact zone. Both calcite and willemite occur in the black material as well, but only sparingly; within this material the fluorescence of the calcite is much subdued. Tiny (submillimeter) grains of native copper are evident in the black material upon magnification. Among the black minerals known from this deposit—including franklinite, magnetite, hetaerolite, and hematite—magnetite was eliminated from consideration because the specimen showed no perceptible magnetism even when tested with a powerful neodymium magnet.

\* A roof pendant is a large mass of rock that sagged into the upper part of an intrusive body of igneous rock. Roof pendants are, in effect, gigantic xenoliths but are not wholly enclosed by the igneous magma that intruded them.



**Figure 1.** The Desert View Mine hardystonite specimen, showing the gray calcite layer (right) and the black oxide layer (left). The hardystonite bleb is along the contact zone, near the top-center of the specimen as photographed. The visible surface is sawn; specimen measures 2¾" × 2¼" × 1½" (7 × 5.5 × 4 cm). *Earl R. Verbeek photo.*



**Figure 2.** Same specimen as in Figure 1, here viewed under shortwave ultraviolet light. As at Franklin, hardystonite fluoresces violet, willemite green, and calcite red. *Earl R. Verbeek photo.*

## ANALYTICAL RESULTS

A thin slab was sawn from the original specimen to facilitate extraction of samples for X-ray diffraction analysis. The instrument used was a Philips (now PANalytical) X'Pert Pro MPD powder diffractometer with a Cu K-alpha radiation source. X-ray settings were 45 kV and 40 mA. The analysis software used was X'Pert Highscore, which matches the resulting diffraction peaks to mineral IDs in an internal library.

The first sample run, a crushed powder derived from the hardystonite area and purified of other minerals as much as possible by sorting with a needle under a microscope, gave an initial X-ray scan strongly indicative of hardystonite. Because hardystonite was unknown from any locality on Earth other than Franklin, a much more careful scan (19 hours at very low scan speed) was run on this same material to strengthen and sharpen the X-ray peaks. Calcite had been removed from this sample by dissolution in dilute hydrochloric acid. The results again indicated hardystonite to a high degree of confidence; every major peak of the reference pattern for that mineral (00-012-0453) was matched in the measured scan. A third scan of equal duration yielded the same results.

Although the X-ray data already identified the violet-fluorescing mineral as hardystonite to a high degree of certainty,

we nevertheless wished to acquire chemical data as an additional check on the results because a related mineral, akermanite, has a similar X-ray pattern. Hardystonite,  $\text{Ca}_2\text{Zn}(\text{Si}_2\text{O}_7)$ , and akermanite,  $\text{Ca}_2\text{Mg}(\text{Si}_2\text{O}_7)$ , are both members of the melilite group and have nearly identical unit cell parameters. Moreover, akermanite is known as a product of contact metamorphism of dolomitic rocks, which matches both the geologic setting of the Desert View Mine (in a roof pendant of a batholith) and the magnesium-rich character of the original host rock (the Bonanza King dolomite). The presence of akermanite in the Desert View deposit would thus hardly be surprising. To test this possibility, we submitted fragments of the violet-fluorescing mineral for energy-dispersive spectrometry. The results were gratifying: The analysis revealed calcium, zinc, and silicon as major components of the mineral but showed no detectable magnesium. The violet-fluorescing mineral is thus conclusively identified as hardystonite.

Additional samples were obtained from different portions of the sawn slab to identify other minerals present. Calcite and willemite, both evident from their fluorescence, were confirmed by X-ray diffraction from the gray area. Samples from the black material could not be separated into their component minerals due to the fine grain size of the minerals and their nonmagnetic character, but franklinite was confirmed near the contact zone, while hetaerolite appeared to be the dominant

oxide mineral more distant from the contact. Additionally, the “leftover” peaks not assigned to hardystonite or franklinite in the slow X-ray scans best fit vesuvianite, which also has been reported from the Desert View locality (Leavens and Patton, 2008). Taken together, these results indicate a transition from (1) a calcium carbonate layer becoming progressively rich in zinc toward the contact zone as indicated by increasing content of willemite, to (2) an intermediate oxide-silicate layer rich in zinc and iron, but depleted in carbonate, to (3) an oxide layer rich in zinc and manganese. Visual examination also revealed the presence of native copper in this layer. The copper, like the hardystonite, is newly reported from the locality.

**CONCLUSIONS**

To the list of minerals common to the Desert View Mine in California and the Franklin Mine in New Jersey, we here add two more: hardystonite and native copper. Both species, the hardystonite especially, strengthen the notion advocated by Leavens and Patton (2008) that the Desert View deposit, like that at Franklin, is exhalative in origin. The discovery of hardystonite at the Desert View Mine removes that species from the list of minerals unique to the Franklin-Sterling Hill area—a distinction that hardystonite held for 115 years.

**ACKNOWLEDGEMENTS**

We are grateful to Kevin Brady for bringing the hardystonite specimen to our attention, and for subsequently donating it to the Sterling Hill Mining Museum for its reference collection. We also thank Lance Kearns of James Madison University for the EDS analysis that confirmed the unknown as hardystonite, Brad Jordan of Bucknell University for his assistance with the X-ray work, and Mark Boyer for his review of the original manuscript.

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**The Franklin Mineral Museum**



32 Evans Street/P.O. Box 54, Franklin, NJ 07416  
 (Between Main Street and Buckwheat Road)  
 Phone: 973-827-3481  
[www.franklinmineralmuseum.com](http://www.franklinmineralmuseum.com)



Exhibited by means of guided tours: Franklin-Sterling Hill mineral specimens, educational exhibits in mining methods and history, including a life-size replica of underground workings, artifacts, gemstones, zinc uses, and a 32-foot-long fluorescent mineral display.

Included in the tours is the Jensen-Welsh Memorial Hall, built especially to contain the Wilfred Welsh collections of fossils, Native American relics, and worldwide minerals and rock specimens assembled for teaching purposes.

Mineral collecting on the Buckwheat Dump. Ample parking. Picnic grounds. Gift shop offering for sale: local and worldwide minerals, fluorescent specimens, agate slabs, onyx carvings, UV lamps, hammers, mineral books, T-shirts, postcards, and much more.

Separate admission fees to the Museum and the Buckwheat Dump. Admission to the Museum includes guided tour.

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**March – Weekends Only**

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**Monday through Friday: 10 AM – 4:00 PM**

**Saturday: 10 AM – 5:00 PM**

**Sunday: 11 AM – 5:00 PM**

Closed Easter, July 4th, and Thanksgiving

*Groups by reservation, please*

**Franklin, New Jersey**

**“The Fluorescent Mineral Capital of the World”**

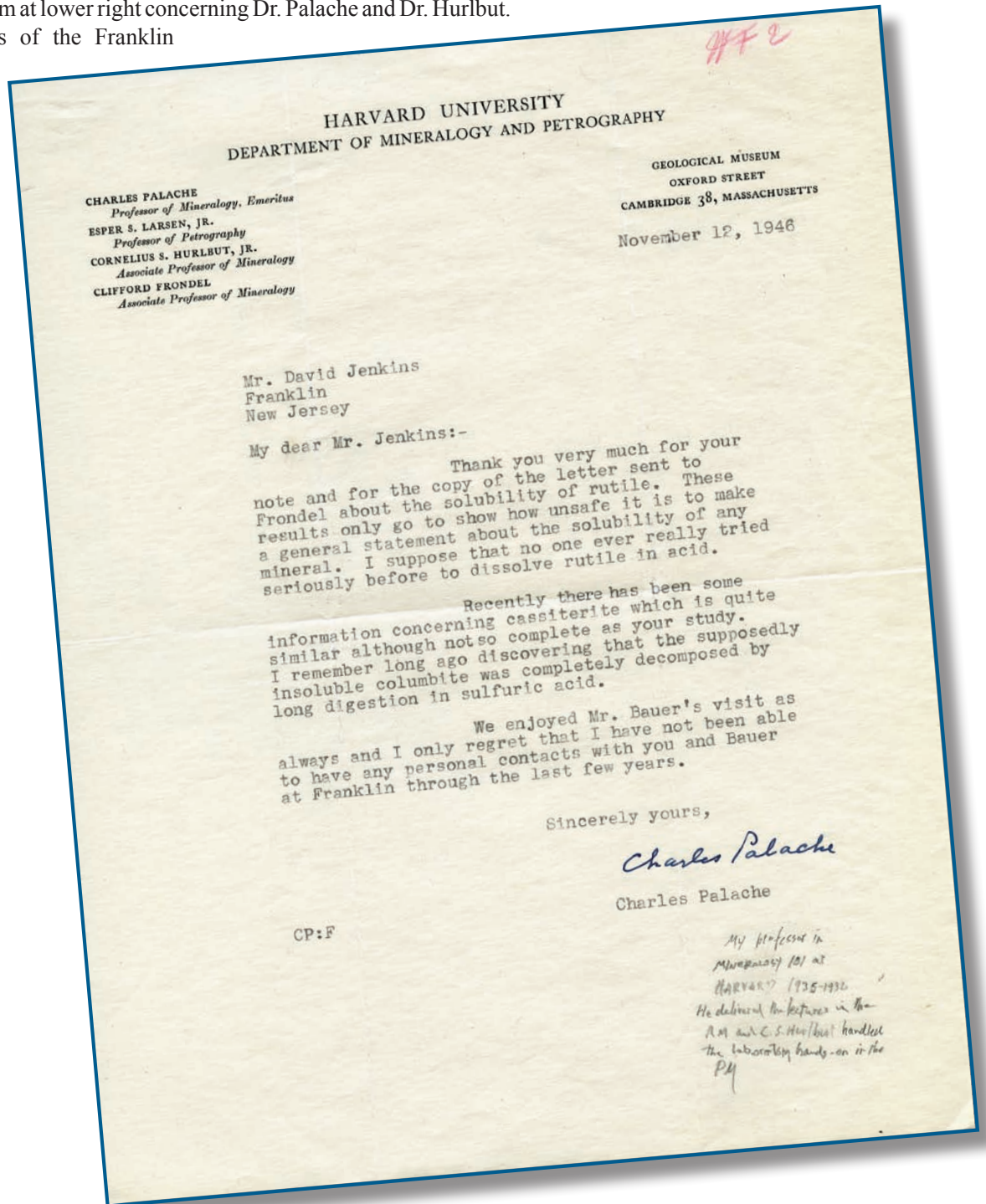
# Letters From the Past

**MARK BOYER**

PRESIDENT, FRANKLIN MINERAL MUSEUM  
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FRANKLIN, NJ 07416

This letter from eminent mineralogist Charles Palache to New Jersey Zinc Company chemist David Jenkins is an indication of the ongoing relationship between the Mineralogy Department at Harvard and the staff of the Zinc Company. The list of renowned names on the letterhead is especially impressive. Also note the annotation by John L. Baum at lower right concerning Dr. Palache and Dr. Hurlbut.

Letter from the archives of the Franklin Mineral Museum. ✕



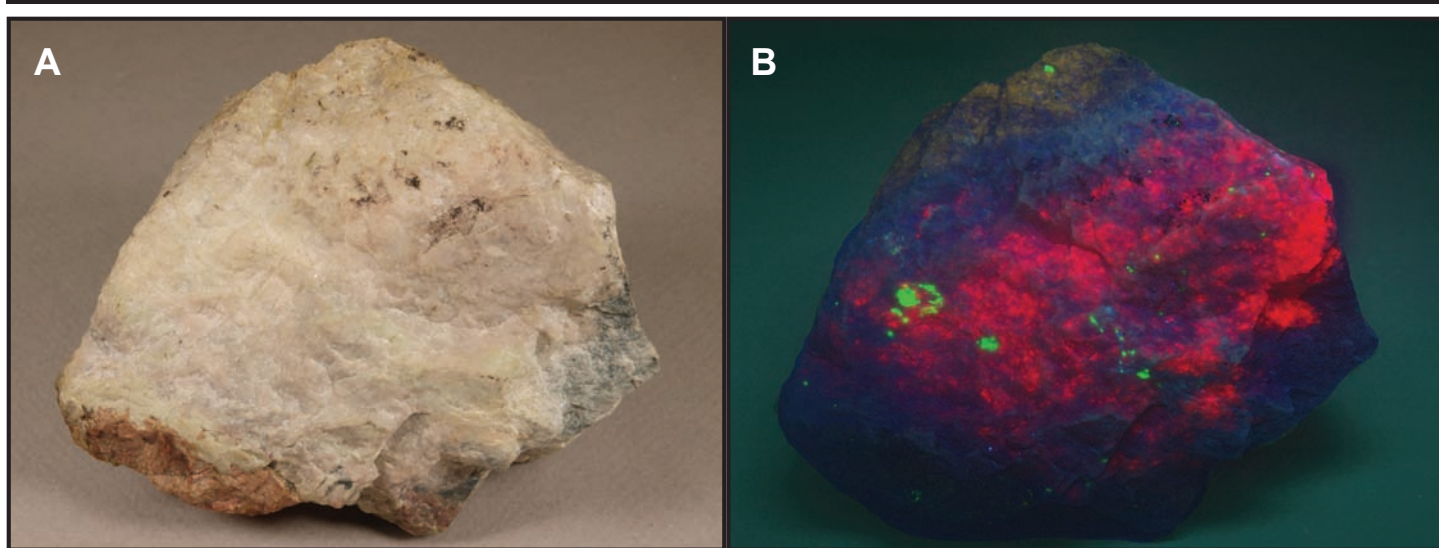
# Fluorescent Grossular From Franklin, New Jersey – An Update

**HERB YEATES**

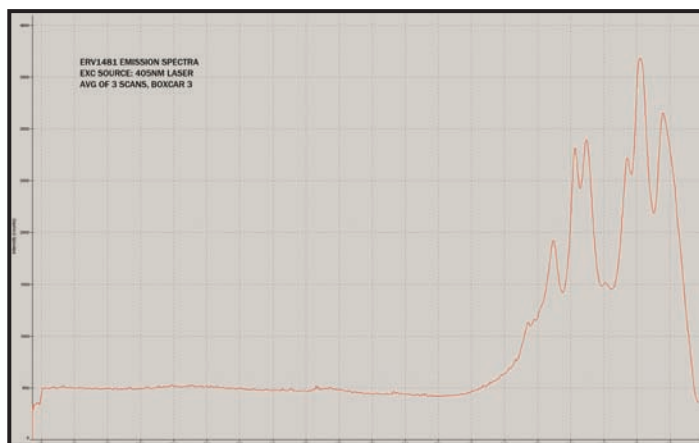
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**Figure 1.** The finest-known specimen of fluorescent grossular from Franklin, shown under (a) visible light and (b) longwave ultraviolet light. This is the specimen in which the fluorescence of Franklin grossular was first noted by Paul Shizume, in whose collection it remains under catalog number PS07001. The specimen measures 4" × 3.25" × 2.25" (10 × 8 × 6 cm). The data in this paper were taken from a similar but less rich specimen, no. ERV-1481 in the collection of Earl Verbeek. Both specimens were described more fully and illustrated in the spring 2011 issue of *The Picking Table*. *Earl R. Verbeek photos.*



**Figure 2.** Fluorescence emission spectrum of grossular from specimen ERV-1481. Scale at bottom shows wavelength in nanometers. Measurements were taken over a wavelength interval from 460 nm (blue) to about 670 nm (red).

## INTRODUCTION

Although grossular has long been known from the Franklin area, particularly as a component of the “Parker Shaft suite” of minerals from the Franklin Mine, its presence as a fluorescent species was unknown until 2011, when a preliminary report was published in the spring issue of *The Picking Table* (Verbeek and Carr, 2011). In that report, red-fluorescent grossular (Fig. 1) was noted to occur as faintly pink grains within massive specimens of axinite-(Mn). A peculiar aspect of the three samples then known is that all contain gahnite as an associated phase. The grossular in these specimens fluoresces a deeper red than the axinite-(Mn) and also fluoresces much brighter under longwave (LW) than shortwave (SW) ultraviolet light, the opposite of axinite-(Mn). The activator of the red grossular fluorescence was then unknown.

Shortly thereafter, the senior author obtained an emission spectrum of the fluorescent grossular (Fig. 2). This emission spectrum was measured with an Ocean Optics spectrometer using a handheld 405-nm laser as an excitation source. Immediately apparent from the spectrum is that the red fluorescence could not be due to trivalent chromium ( $\text{Cr}^{3+}$ ) substituting for aluminum, a known cause of red fluorescence in grossular, and also in ruby corundum, spinel, kyanite, etc. This prompted a formal investigation, the results of which were published in Gaft et al. (2013) and summarized here.

## EXPERIMENTAL METHODS

Fragments from one of the original specimens studied in 2011 (specimen ERV-1481) were submitted to the Laser Distance Spectrometry labs in Petach Tikva, Israel, where laser-induced, time-resolved spectra were obtained to determine the activator(s) of the red fluorescence. In contrast to steady-state luminescence spectrometry, during which an emission spectrum such as that of Figure 2 is measured while the excitation source is continuously beamed on the specimen, the use of a pulsed laser as an excitation source enables one to deliver a powerful but extremely brief burst of light to induce fluorescence. Following such brief excitation of fluorescence, the light emitted by each activator present in the mineral will decay at different rates. This can be used to advantage by setting a *delay time*—that is, the time between the end of the laser pulse and the beginning of measurement, when the detector is turned on to begin recording the emission spectrum of the mineral. By setting a suitable delay time, the light emitted by rapidly decaying activators can be nearly eliminated from the emission spectrum, thereby allowing the light from other activators to more readily be detected and more accurately measured. One can also select a *gate time*, which refers to the time interval over which the emission spectrum will be measured. These are short time periods: The laser pulse typically lasts 5 to 10 nanoseconds, and the delay and gate times for the Franklin sample were 200 nanoseconds and 1 millisecond, respectively. Spectra for the Franklin grossular were obtained both at room temperature (300° K) and at much lower temperatures (100° K) to decrease lattice vibrations and sharpen the emission peaks.

Excitation spectra were also obtained in the Gaft et al. (2013) study and were of great use in assigning observed emission peaks to the activators responsible for them. In this method, one sets the detector of the light emitted from a mineral to the wavelength of one of the observed emission peaks and then monitors the intensity of that peak as the wavelength of the

excitation source (in this case, the pulsed laser) is changed. Dissimilar excitation spectra are a common clue that more than one activator is present in a mineral and is contributing to its fluorescence.

## RESULTS

All of the major emission peaks shown in the steady-state emission scan of Figure 2 were confirmed by the time-resolved spectra of Gaft et al. (2013). Excitation spectra were measured for four of these peaks and were closely similar, a strong suggestion that they are all due to the same activator. Though red emission of the type shown by the Franklin grossular had never before been observed in natural garnets, comparison to the luminescence of synthetic garnets allowed identification of the activator as quadrivalent manganese,  $\text{Mn}^{4+}$ . Gaft et al. (2013) noted that luminescence due to  $\text{Mn}^{4+}$  in minerals is extremely rare, though it is well known in artificial materials, including gallium-gadolinium garnet, whose luminescent properties compare well to the Franklin material.

As is well known to many collectors of the local minerals, the fluorescence of quite a few of our favorite species, including willemite, calcite, esperite, clinohedrite, and axinite-(Mn), is due to divalent manganese,  $\text{Mn}^{2+}$ . The presence at Franklin of  $\text{Mn}^{4+}$  as an additional activator of fluorescence is thus quite interesting, particularly given its presence in grossular. As noted by Dunn (1995, p. 282), divalent manganese is abundant in the high-temperature, primary silicate minerals at Franklin and Sterling Hill, and trivalent manganese is not rare, but quadrivalent manganese is spatially restricted to the weathering (oxidation) zones, where its most notable expression is in secondary oxide minerals such as chalcophanite, hydrohetaerolite, woodruffite, todorokite, etc. To find  $\text{Mn}^{4+}$  as an impurity constituent and activator of fluorescence in a mineral from the hydrothermally altered rocks of the “Parker Shaft suite” was thus an unexpected pleasure.

## REFERENCES

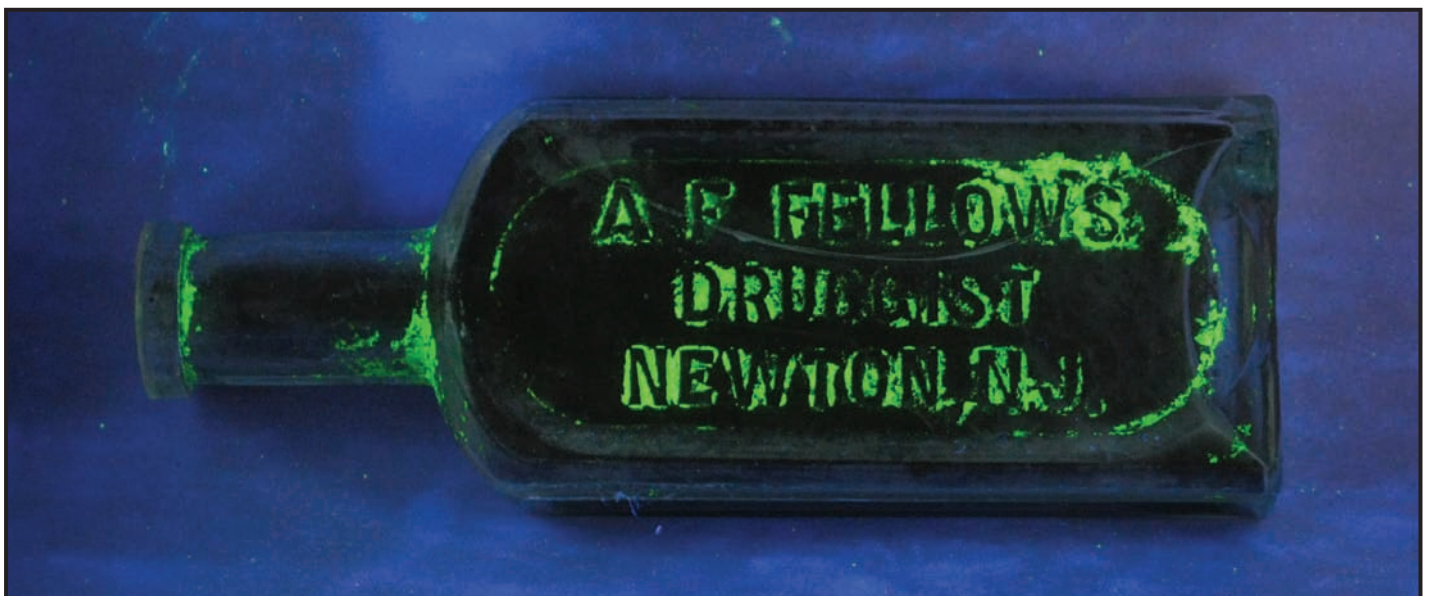
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# A Franklin Artifact

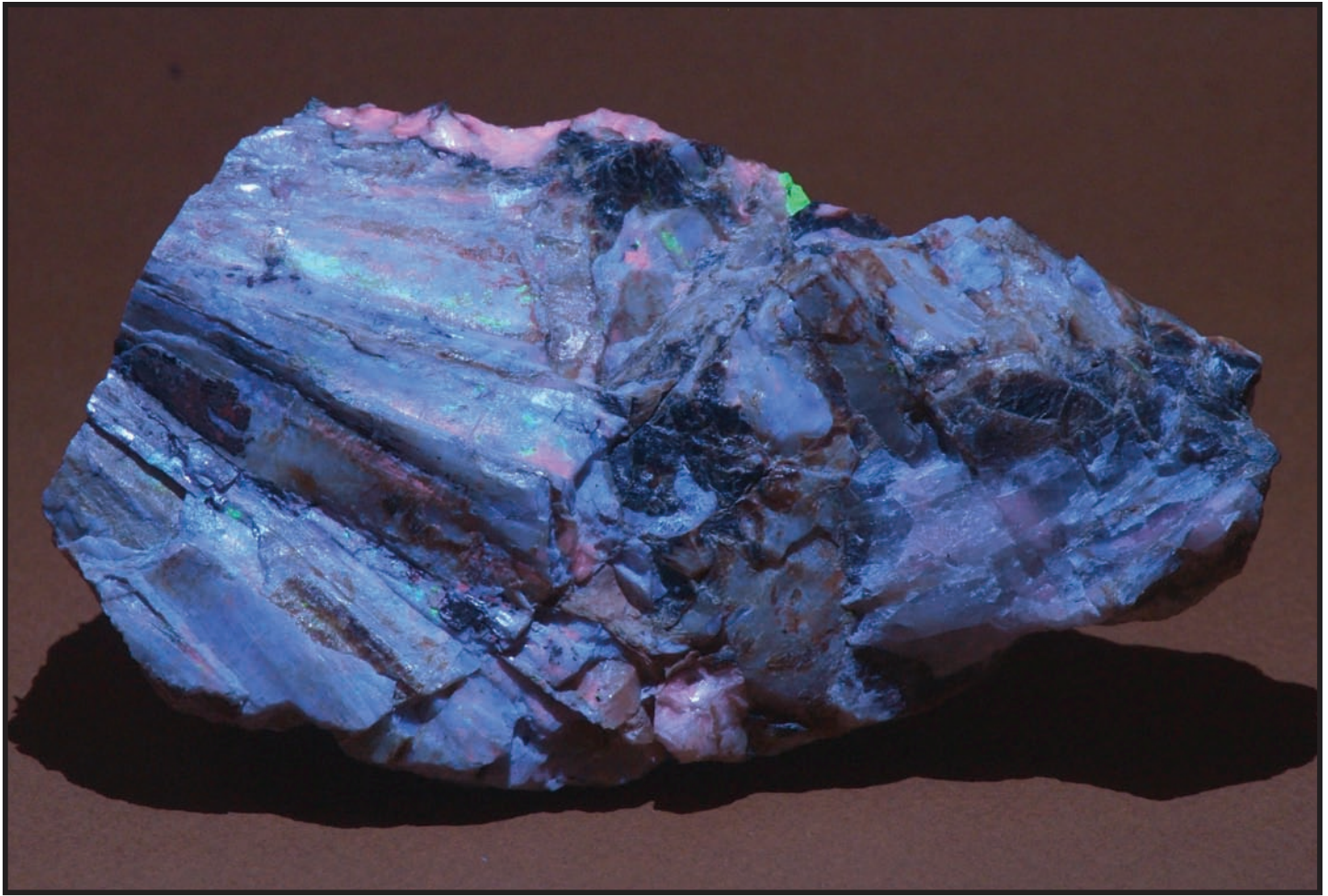


Pictured here in white light and shortwave ultraviolet light is a bottle unearthed at the Mill Site (a.k.a. the site of the New Jersey Zinc Company Mill No. 2) in Franklin, N.J., by local mineral collector Mark Boyer. On the warm evening of May 21, 2010, Mark was investigating the recent diggings of a fellow collector in the woods just outside the fence of the Franklin House Senior Apartments. When he saw how inviting the opportunity was, he decided to poke around the fresh dirt himself. Along with this bottle, Mark uncovered a small boulder of hardystonite in calcite matrix with willemite, clinohedrite, and small bits of esperite, as well as a good piece of “crazy calcite” with willemite.

The bottle is embossed “A.F. FELLOWS, DRUGGIST, NEWTON, N.J.” A.F. Fellows was a dealer of wholesale drugs and patent medicines in the late 1800s. This style of cork-stoppered bottle dates to the 1890s, which is about the time that fill was dumped at the Mill Site. The bottle was covered with muck, and Mark hastily wiped most of it off before heading for home. While lamping his finds later, he was struck by the bottle’s lettering, highlighted by the fluorescent willemite-dust-enriched mud. So Mark—who is also a collector of old bottles, Franklin oddities, and items with unexpected fluorescence—decided that this is one collectible he would never clean.



Mark Boyer photos.



A fine specimen of Franklin barylite in coarse blades, viewed under the light from an iron arc spark (large photo) and in visible light (inset photo). These photographs duplicate what Charles Palache saw when, in his 1935 monograph, *USGS Professional Paper 180*, he described barylite as showing a “vivid blue fluorescence.” In succeeding decades, however, as shortwave mercury-vapor ultraviolet (UV) lights replaced iron arc spark units, Palache’s statement led some hobbyists to believe that their specimens of margarosanite disseminated in feldspar were barylite, and specimens so labeled are still seen in some older collections. Moreover, to add to the confusion, true barylite shows almost no response to modern shortwave UV lights; the fluorescence is dim at

best. The record was finally set straight in the fall 1993 issue of *The Picking Table*, in which Richard Gaines and Richard Bostwick discussed the fluorescence of barylite under different UV light sources and proved Palache correct. This specimen is particularly rich in barylite and is about 5” (13 cm) long. The specimen also includes a fair amount of native copper. Originally from the Princeton University collection, it is presently owned by the Franklin Mineral Museum and is on display in that museum’s local minerals exhibit room. *Jeff Glover photo, Outdoors-Indoors Photography.*

