



Spring/Summer 2019
Vol. 28 No. 1



STERLING HILL NEWSLETTER

Recipient of the 1999 Carnegie Mineralogical Award



Adit shaft station, circa 1956, still under construction in this photograph; completed in 1958. New steel tracks are visible on the floor, soon to be lowered and installed in the shaft. The cages rode on these rails down to 1920 level. The compressor pipes and the main water pipe that carried the pumped water from the mine are not yet installed. They will be in the far left compartment. The overhead travelling hoist is still in place to this day, although not operable. [Ed. note: for information on an exciting new project at Sterling Hill, an exhibit with a motorized man cage at the shaft station, see the Message from the President in this issue.]

www.sterlinghill.org

A nonprofit foundation in furtherance of mining

preservation, scientific research and earth science education.



Sterling Hill Mine Word Search

Angela Grillo

Rocks and Minerals

H	E	T	I	R	O	U	L	F	I	E	I	B	S
T	U	R	P	R	E	H	N	I	T	E	I	O	A
E	T	I	L	A	D	O	S	T	N	A	N	R	M
G	E	O	D	E	Z	I	N	C	I	T	E	N	E
A	E	A	T	U	R	Q	U	O	I	S	E	I	T
A	A	A	C	I	M	A	Y	S	L	C	E	T	H
H	A	L	I	T	E	E	F	L	I	N	T	E	Y
E	T	I	N	E	L	E	S	D	I	Z	T	T	S
E	S	Q	A	A	A	G	A	T	E	R	E	N	T
T	I	E	T	I	C	L	A	C	T	U	E	I	T
I	B	E	Q	U	A	R	T	Z	D	B	I	I	O
R	T	O	J	A	S	P	E	R	R	Y	I	O	I
Y	A	Z	N	R	M	A	L	A	C	H	I	T	E
P	C	H	N	Q	N	A	I	D	I	S	B	O	E

- FLINT
- FLUORITE
- QUARTZ
- TURQUOISE
- MICA
- OBSIDIAN
- ZINCITE
- AMETHYST
- BORNITE
- RUBY
- SELENITE
- HALITE
- MALACHITE
- PREHNITE
- CALCITE
- PYRITE
- SODALITE
- JASPER
- GEODE
- AGATE

Angela Grillo is ten years old and is in fourth grade at Holland Brook School in Readington Township, NJ. She is an enthusiastic mineral collector; and she has in her collection all of the minerals in this Word Search.

Message from the President

Bill Kroth

With the Sterling Hill Mining Museum on very strong footing, we look forward to 2019 as a year of new building projects. Some of these are large-scale ventures that will have a major impact on our museum experiences and our presentation. All are designed to provide our visitors with a better understanding of the mining and refining processes.

Decades ago, the Hauck Brothers obtained a stamp (crushing) mill from a mine in Canada that was 99 percent complete and virtually unused. Similar to the one displayed outside our gift shop, this machine is twice as large, containing ten crushing hammers; and it still has all its original timber components. The unit was built inside a wooden building, and all of the components were found to be in perfect condition. We continued to preserve it by safely storing it out of the weather in our upper mill building from the time it was delivered by truck over 20 years ago.

I wondered if we would ever have the expertise and manpower to move and assemble the 140-year-old relic on our lower property. By chance, we were visited by a leading expert and restorer of stamp mills about two years ago, Charlie Connell of Arizona. Charlie has offered his expertise and time in guiding us with the reassembly. Most importantly, he has found sources for the missing components and has devised an attractive and economical roofing system that will provide the required protection, once the mill is on display. Former Sterling Hill miner and board member, Doug Francisco, will be project manager, and he already has started taking inventory of all the components and numbering all the joints. This display will be located near the Edison Tunnel exit, just west of our World Trade Center Memorial. We hope to have the mill completed by June of this year.

Next, we plan to rebuild and motorize the man cage at the west shaft station at the end of the main adit. Our best man cage is displayed directly outside our main entrance, where its size and mechanics are best seen. We have a smaller man cage and motor transporter set on the

inclined shaft tracks at the end of the main adit; that presently is a static display. Doug has devised a way to modify that vehicle to make it a moving display, complete with mannequins. It will be replaced by a heavy steel main structure, with light-weight aluminum components, and with a small electric hoist that will replicate approximately 20 feet of vertical movement. As visitors approach the shaft, a sensor will cause the lift to operate and our team of mannequin miners will automatically appear from the depths of the mine, stop, and then disappear back down. This exhibit will create a great visual effect; for a minimal investment of effort and money. Doug Francisco is the project manager, and he already has removed the man cage and begun component replacement.

We are near completion of our “railroad yard” project. The interior of our 1942 metal caboose is now complete, with all new wood, windows, cushions, and restored original components. It has far exceeded my wildest dreams; especially when I think back to when we first saw the caboose languishing in the recycling yard in Fanwood, NJ. Due to a very wet fall, we have been unable to complete the exterior, but we will finish it in dark red early this spring. All railroad signs and related equipment have now been painted and relocated to the “railroad yard.” We have installed a small metal pavilion just south of the caboose to protect and display three small track cars, including two motorized units (both of which still operate on gasoline) and an old-fashioned hand-pump car. With the help of Tom Charette and his team of track workers from the New York, Susquehanna, and Western Railroad (NYS&W), we now have an additional 65 feet of track extending south of the caboose. Doug Francisco and Tom Hauck found the rail on nearby Cork Hill Road and brought it to our property during the fall of 2018. The remaining components of the track, including wooden ties, tie plates, and joint bars were provided and installed *pro bono* by the NYS&W folks during January 2019. The new track will provide a “circuit” where we may actually operate the three units at special events!

MESSAGE FROM THE PRESIDENT

Continued from page 3



The interior of our restored caboose is now completed, and it looks perfect.



The work that would have taken us weeks was professionally accomplished in a mere three hours by the NYS&W railroad crew. Over 80 feet of additional track has now been added to our new railroad pavilion.

Finally, if all goes according to plan, the American Museum of Natural History (AMNH) will display our 20-foot-long by ten-foot-high slab of fluorescent ore by the end of 2019. Five million visitors will see this magnificent specimen in New York City each year. In keeping with this theme, we hope to complete our own similar display at the remaining part of the outcrop that is still exposed in the Fill Quarry. Even larger in area than the piece at AMNH, our "cut" has been protected, waiting for its own showcase. We will construct a structural steel pavilion complete with high-powered UV lights that will enable viewing by day or night. During the past year, we have monitored drainage in the lower Fill Quarry and, fortunately, water freely drains, allowing us to build simple concrete footings and slabs. Our 24-

Continues on page 5

... "there's no other place like it on Earth."



Listed on the National Register of Historic Places since 1991

Sterling Hill Newsletter

EDITOR

JEFFREY OSOWSKI

30 Plant Street • Ogdensburg, NJ 07439-1126

Sterling Hill Mining Museum Foundation

OFFICERS

William Kroth

PRESIDENT & EXECUTIVE DIRECTOR

Jeffrey Osowski

VICE PRESIDENT

Haig Kasabach

SECRETARY

Denise Kroth

TREASURER

TRUSTEES

Doug Francisco • Missy Holzer • Robert Horn • George Hutnick • Michael A. Pierce • Gordon Powers • Walter Spink • Jeffrey Winkler

ADVISORY COUNCIL

Cathy Astor • David Astor • Robert Batic • Richard Hauck (Trustee Emeritus) • Robert Hauck, Sr. (Trustee Emeritus) • Fred Lubbers • Steven Phillips • Alan Rein • Earl Verbeek • Eric Weis • Derek Yoost

The Sterling Hill Newsletter is the official journal of the Sterling Hill Mining Museum Foundation, a nonprofit institution. It is published two times a year, in April and September.

Subscription to the Sterling Hill Newsletter is included with membership in the Sterling Hill Mining Museum Foundation. For details look for the membership form in this issue. If the form is missing, contact the museum for information.

MESSAGE FROM THE PRESIDENT

Continued from page 4

foot-wide by 30-foot-long enclosure should be completed by the time of the unveiling in New York City. All of our new construction will significantly complement our already amazing displays, providing an added incentive for people to revisit the Sterling Hill Mining Museum. 🐛



Newly installed railroad track connecting our caboose and the new pavilion may be used for running the smaller motorized units and handcar on special occasions.

Bill Kroth is a retired geotechnical and civil engineer who has been involved with the Sterling Hill Mining Museum since the early 1990s. Bill developed a love of minerals in the 7th grade and an interest in amateur astronomy in high school. Now in his mid 60's with plenty of "retirement time" Bill and his wife, Denise, are at Sterling Hill every day hoping to pass their love of science to the current generation and to help make the museum a world class attraction.



Standing next to the completed track are NYS&W volunteers (from left to right): Nick Stevens, Bryan Kellam, James Bednarovsky, David Fetzer, Tom Charette, Kevin Kent, and Patrick Schaub. Thank you gentlemen!

Fossil Track Specimen Donated to Sterling Hill

Winter Rosen

We recently have acquired a new addition to our Zobel Hall Museum that is over 200 million years old – a dinosaur track fossil! Along with the fossil came an educational stanchion with artwork. This wonderful specimen was kindly donated by Tilcon New York, Inc. The tracks had been on display at Tilcon's West Nyack, NY corporate office.

The specimen is approximately 5 feet by 3.5 feet by 1.5 feet. Upon arrival, we noticed two existing cracks and, thus, decided to drill three holes through the side of the specimen and insert threaded rods to prevent any further damage. After this was done, the specimen was brought to the Zobel Hall Museum and placed horizontally on an old



200+ million year-old dinosaur tracks outlined in chalk. These dinosaur track fossils can be found in the back corner of Zobel Hall, near the periodic table.

Continues on page 6

FOSSIL TRACK SPECIMEN

Continued from page 5

mine cart. It was placed this way so visitors can place their hands on the four tracks, which have been outlined in chalk to make them more visible.



Artwork from the stanchion depicting how the landscape appeared in Clifton, NJ approximately 200 million years ago when the tracks were made.

These dinosaur tracks were found in 2000 at the Clifton Quarry in Clifton, NJ. They are approximately 200 million years old which places them in the Jurassic period. The tracks are inlaid in red sandstone, typical of the Passaic Formation of the Newark Supergroup.

The exact species of dinosaur is unknown; however, after examination of the three-toed tracks (known as grallator-type tracks), researchers have concluded that it was a type of bipedal theropod dinosaur. It is believed that the dinosaur that made these tracks was carnivorous, approximately seven feet tall, fast, weighed less than 100 pounds, and traveled in packs.

Come check out this wonderful addition to our museum! 🦕

Winter Rosen has been working at the Sterling Hill Mining Museum since 2015; she currently is Executive Assistant. Winter has earned a bachelor's degree in Environmental Science with a minor in Earth Science from Ramapo College.



Artwork from the stanchion depicting the type of dinosaur that left these tracks.

X-ray Fluorescence Unit Purchased by the Sterling Hill Mining Museum

Earl R. Verbeek

The Sterling Hill Mining Museum recently purchased a portable X-ray fluorescence unit as an additional research tool for studies of local minerals. There are more than 370 different mineral species in the Franklin/Sterling Hill District, many of them having different appearances in different mineral assemblages. As a result, sight identification of some of our local minerals is a risky process. The new X-ray fluorescence unit joins our existing Raman spectroscopy system as a means of mineral research.



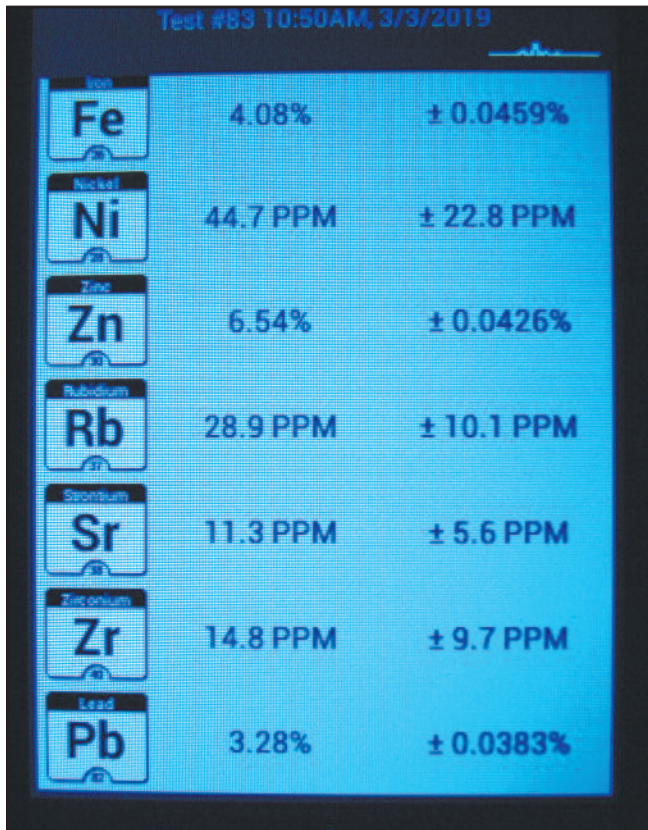
About the size and weight of a battery-powered drill, the XRF analyzer is truly portable and simple to use. Just aim and pull the trigger.

Continues on page 7

X-RAY FLUORESCENCE UNIT

Continued from page 6

Somewhat resembling a portable drill (see photo), the X-ray fluorescence unit in operation emits a low-intensity X-ray beam from its narrow end. These X-rays enter the mineral under study and stimulate the emission of secondary X-rays from the sample, the wavelengths and intensities of which are measured by a detector. Because each chemical element in the mineral emits secondary X-rays of known wavelengths, the results can be used to calculate a chemical analysis of that mineral in less than a minute. No sample preparation is required, and the analytical procedure does no harm to the specimen.



Ten seconds after the releasing the trigger, the readout provides the detected elements in incredible detail.

Are there drawbacks? Sure. One is that the X-ray “gun” cannot be aimed at a precise point on a specimen, so small mineral grains are poor candidates for study. Another is that the X-rays penetrate the sample to a significant depth, so one is measuring the elements present

within a volume of the sample, not just at the surface. Fortunately for us, many of the minerals most in need of chemical study, including minerals of the feldspar, amphibole, pyroxene, and garnet groups, occur dominantly in coarse-grained assemblages, so these complications can be minimized. An unavoidable complication, though, is that the X-ray unit cannot “see” elements of light atomic weight, including (critically for us) sodium. We can partially offset this drawback by manually determining if sodium is present, but we cannot estimate its abundance beyond noting if it is a major or minor component.

Complications aside, X-ray fluorescence is a powerful technique for identifying many of our local minerals that defy sight-identification. It is particularly useful to us because it provides good data on the chemistry of a mineral and thus is a perfect complement to Raman spectroscopy, which, as you might remember from previous newsletters, provides information on the structure (the atomic bonds) of a mineral. The two techniques in combination, then, are much more powerful than either alone. As just one example, Raman spectroscopy can readily tell us that a given specimen is a member of the garnet group, but in less than a minute, the X-ray fluorescence unit can tell us which species of the garnet group (andradite? spessartine? grossular?) we have before us. Many mineral species require data from more than one analytical technique for confident identification, and Sterling Hill now possesses that capability. 🗿

Earl R. Verbeek spent his career as a research geologist for the U.S. Geological Survey in Lakewood, Colorado, and retired to New Jersey in 1998. Subsequently he served as Resident Geologist of the Sterling Hill Mining Museum and as Curator of the Franklin Mineral Museum.

Letter from Sterling Hill STEM Scholarship Awardee

Gabriella Ciasullo

As my second year at Villanova University is approaching an end, it is a good time to reflect back on my experiences so far. I am majoring in Chemical Engineering with hopes of entering the pharmaceutical or biotechnical industry, focusing on medical research. At Villanova I have been exposed to inspiring professors, a network of accomplished scientists, and opportunities to grow as a student and person. Most recently, I have taken courses in Organic Chemistry, Thermodynamics, and Fluid Mechanics. As a chemical engineer I have realized the importance of compiling many different types of information and knowledge to solve intricate and meaningful problems. The demanding course load and intelligent fellow students I have encountered have challenged me to work harder and be even more driven in accomplishing my goals. Through a series of qualifying phases, I have achieved a spot on a research team where I now am able to work with genetic material. The goal of the research is to manipulate the innate immune response to improve gene therapy, especially pertaining to the treatment of cancer.

I also have become a tutor on campus, which has proven to be extremely rewarding. I love having the ability to

connect with all types of students and engage with them to help better their understanding in various topics and improve their study skills. Along with interesting research, a fulfilling job, and an exciting curriculum, I have found clubs and activities on campus that I enjoy. I have joined Pastorals (a choir that sings at the Villanova church services), CrossFit (an inspiring type of group fitness), and I lead a Social/Wellness Committee for the Society of Women Engineers.

It is difficult to summarize all that I have learned and gained by going to college because there have been so many important and meaningful experiences thus far. I will take many of the connections I have made and lessons I have learned with me long after I graduate. Until then, I am savoring every moment and opportunity I have at this great university, with ambitions of working hard and staying determined. Once again, I want to thank the Sterling Hill Mining Museum for their generous contribution to my academic endeavors. 🐼

Gabriella Ciasullo is a resident of Ogdensburg, and has been awarded Sterling Hill Mining Museum STEM Scholarships in 2017-18 and 2018-19.

John Kolic's Mining Notes

Doug Francisco

There were lots of nicknames floating around in the mines. There was Batman, Chickenman, Ratman, Mr. Clean, Tee-Hee, Tricky Dicky, Deadman, Ned the Head, and many other colorful monikers that I can't remember. Then there was John Kolic, whom we simply referred to as "John Kolic," out of respect. I guess I thought of John as a kind of underground superhero. Not because he could leap tall



buildings or stop a bullet or was faster than a speeding ore train (although when hearing of a specimen-find in some work area, he was there in a flash), but because he could see through rock walls, smell new specimens, and toss a bowling ball better than any of us. In a superhero action movie setting, I imagine he would disappear into a dead-end drift somewhere and reemerge as "John Kolic" in a one-piece leotard, with miner's belt and boots, a jeweler's

Continues on page 9

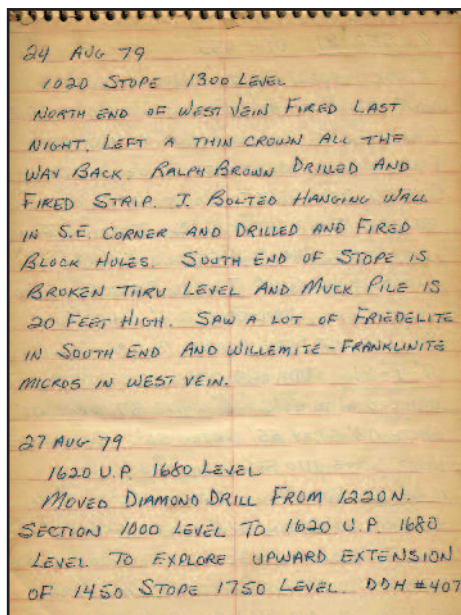
JOHN KOLIC'S MINING NOTES

Continued from page 8

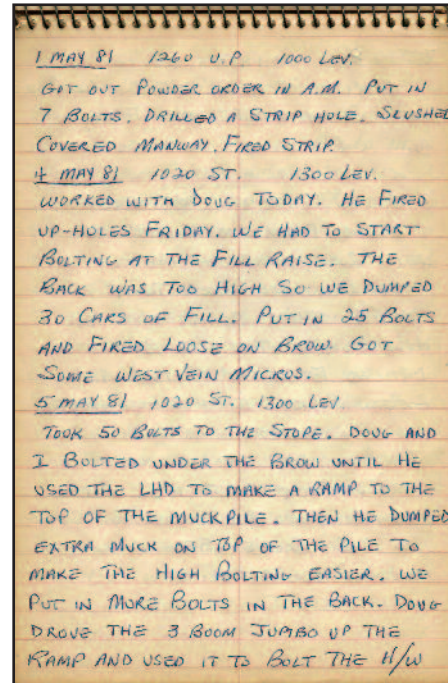
loupe in one eye, a lit cigarette in one hand, and a sparkling specimen in the other. Quiet and mild mannered to say the least, John always had a sly smile, as if he knew something we didn't. I know there have been articles written about him in previous newsletters, and he was legendary in collecting circles, but I had the pleasure of working with him on many occasions, and can perhaps shed a different light or at least turn up the lumens on his daily work-life underground. As I was rooting around recently in the mine office library, I peered into a tattered box and saw a small pile of John's notebooks; nondescript, ordinary, five- and ten-cent store spiral notebooks. I opened the first and started reading.

I opened page one of the earliest date in the notebooks (August 24, 1979); what an unexpected miraculous find! There were eight notebooks in all, and they encompass every day from this date, through the closing of the mine in 1986; and for the last five, every day is detailed for the time he worked after the mines closed. A few days after they broke through the concrete plug used to seal the adit, on July 1, 1989, he walked down the shaft ladders to find the water. Through John's journal entries regarding the location of the water on various dates, one can plot how quickly the water rose through the levels (0.93 feet per day). He invited miner Chris Auer and me to share in the exploration, so a week after the mine was reopened in 1989, we spent the day exploring. Here's proof.

I have a suspicion that John didn't just start writing out of the blue one day. As he was so very precise and detailed, I firmly believe there are earlier notebooks. He started at the NJ Zinc Co. in 1972, so for the first entry to be in 1979 tells me there are seven years worth of diaries somewhere. It haunts me

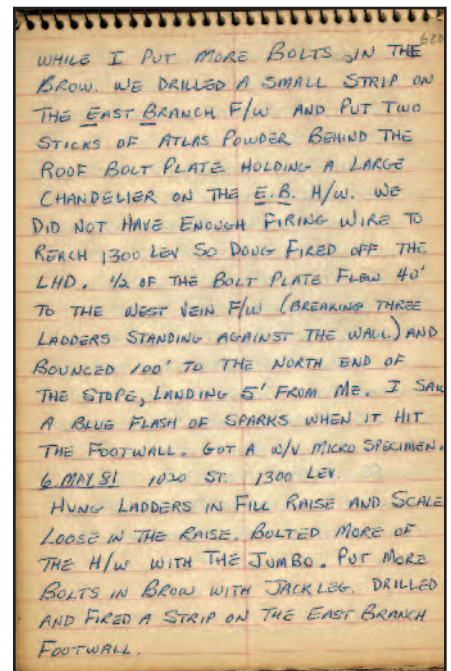


to not know if, and where they are, and I've spent numerous hours searching.



A lot of his entries may not be of interest to some, as he was pretty concise with whatever the task was. But there aren't many lines in the notebooks that don't contain a reference to a specimen-find, and whether it made its way into his lunch box or not. As a result, revealing what

is in his notebooks will be fun for many of you rock hounds. His ability to find, curate, and explore the roots of these minerals was uncanny and legendary. Though we worked side by side for many adventures, I just nodded at his specimen hunting, never paying much attention myself. Many entries record his calling or writing Pete Dunn for confirmation of one questionable mineral or another. There are many entries recording my selling him specimens of kolicite (it was found in 1020 stope which I ran for many years). John took over for me when I went on



The 1020 stop was horseshoe-shaped, so we fired in the east branch, all the way around into the west branch. I almost killed John, but in his typical low-key, calm manner finished his note with "got a W/V micro specimen."

JOHN KOLIC'S MINING NOTES

Continued from page 9


vacation, and when I returned, he showed me where to look for these tiny crystals. I probably stood on and buried hundreds of pieces (I was a bull in a china shop).

I intend to release John's notebooks slowly, through each successive newsletter, perhaps two years at a time. The first set of notebooks can be found on the Sterling Hill Mining Museum website, at www.sterlinghillminingmuseum.org/kolics-work-diaries.

In all of the entries in John's notebooks I could find only one attempt at humor, as he noted that diamond drilling is "very boring." The entries contain a lot about his diamond drilling, again interesting to some, maybe not so much to others. Take from these journals what you want. To me they are priceless insights about mining at Sterling Hill, and about the man, the legend, John Kolic.

Glossary to abbreviations

E/V	east vein
W/V	west vein
H/W	hanging wall

F/W	foot wall
XTALS	crystals
DDH	diamond drill hole
LHD	diesel powered shovel with one yard bucket
UP	undercut pillar
# ***	this number, written over a specific mineral, is John's collection number
ST	stope
53 drill	standard Gardner Denver piston-leg drill, with either a short or long leg
83 drill	could be a leg-mounted drill; faster but much heavier 

Doug Francisco, a trustee at the Sterling Hill Mining Museum, is a graduate of the Brinker School of Surveying and Mapping. For 12 years he was a miner at Sterling Hill; and he worked for 30 years in heavy highway bridge construction. His love for Sterling Hill runs deep.

The NJ Zinc Co. Bowling Alley

John Hornyak

The front of the NJ Zinc Co. bowling alley in Ogdensburg faced Avenue B. It had an open porch which was a meeting place for the kids in the area, all of whom had their initials or something carved in the floor or wall of the building. It had a door in the center of the porch, which was the entrance to the poolroom and a window on each side of it. The kids could watch men play pool, etc. unless the men pulled the shades down. There were two pool tables; and benches, chairs, and tables on which the men played cards, checkers, etc. Above the pool tables were wires with little doughnut beads on them. When they would get one of their numbered balls in the pocket they would reach up with their pool stick and move a bead to the side until all the balls were in. The one with the most beads on his side won the game.

The main entrance to the bowling alley faced the parking lot and Plant Street. Upon entering, the alleys were on the left with L-shaped benches for players to sit on while

bowling. On the right, up four steps, was another entry to the poolroom. What I thought was interesting was a tall chair, similar to a life guard's chair, on the right side of the entrance, with a window behind it facing the poolroom. An employee from the NJ Zinc Co. would sit in this chair and observe the goings-on in the poolroom and the bowling alleys. There were two alleys, and on both sides of the alleys were two chalkboards with chalk and erasers. On each side of the starting lines the boards had large squares for your name, ten squares for your score, and a large square for your final score. You had to keep your own score or designate someone to keep score. If it was a tournament, the scores were left on a long sheet of paper, but for regular games you kept your own score, and then all was erased and you started all over again. In tournaments or larger games you always changed alleys, to be fair.

The alleys were separated by the ball return, which was made of wood grooved out to fit the bowling balls. At the

Continues on page 11

THE NJ ZINC CO. BOWLING ALLEY

Continued from page 10



The NJ Zinc Co. bowling alley on Plant Street, from the late 1950s, with pinsetters John and Bill Kibildis.

end of the ball rack was a square post, on top of which was a sunken-in metal pan. In the pan was a large spool of white chalk with a hole through the center into which you could put your thumb or fingers to get chalk on them if the ball might be too tight or just sweaty. The part of the alley where you threw your ball was called the apron, which was of course even with the alleys. Next to both alleys from the aprons was a step-down to the bottom of the alleys that led down to where the pin setters went to set up the bowling pins. At the end of each alley was a built-up sidewall with a flat seat on top for the pin setters. Around the wall was a step-down, called the Pit, and in back of the Pit was a slightly swinging backstop made of wood covered with leather to keep the bowling pins from receiving too much damage. To set up the bowling pins, there was a square hole in the center and bottom of the alley which had a metal pedal in it. As you pushed the pedal with your foot and held it down, ten steel pins protruded up through the alley on which you put the bowling pins which had holes in the bottom of them. When the pins were all set up, you slowly pulled your foot off the pedal, which retracted the steel pins back into the alley. You hoped none of the pins fell down once set as you got out of the Pit and on the seat. If the bowler threw the ball too hard and fast you did not sit – you walked part way up the side of the alley. Some pins flew out of the Pit hitting the windows next to each Pit, but they were protected with steel bars. The pins even flew into the next alley. You soon learned who the fast and slow bowlers were after the bowler finished throwing the ball. You would go back into the Pit, pick up the ball, and put it on the ball return, which was up high at the start, then went downhill. After the bowler threw his second ball, the process starts all over again. It was a tough job for ten cents a game! Believe me, I know because I was a pin setter!

The Zinc Co. had its own bowling team. They played teams from Franklin, NY, and Palmerton, PA. My brother

Andrew played on the team. As we grew up we formed our own team, as did the women. Eventually, the Zinc Co. closed down and turned the alley over to the Ogdensburg Fire Department who ran it for a short period before it was closed permanently. If you ever visit the Ogdensburg Fire House, you will notice that their kitchen counter is made of part of one of the alleys. The bowling alley was sold and is now a private home. 🐞



The men's bowling teams from Ogdensburg and Palmerton, from the 1950s. The Ogdensburg bowlers were Andrew Hornyak (brother of John Hornyak), John Kardos, Metro Hadowanetz (brother of Wasco Hadowanetz), John Geydoshek, Mike Antonowich, and Michael Kubic.

John Hornyak was born in 1925 and is a lifelong resident of Ogdensburg. He is a World War II Navy veteran who loves writing and reminiscing about life in Ogdensburg. John worked at the mine in the maintenance, mill, and security departments, in the late 1940s and early 1950s.



The women's championship bowling team from Ogdensburg, 1957-58. Bottom row (left to right): Alice Hornyak (wife of John Hornyak), Rose Onder, Claire Stoll (niece of John Hornyak). Top row (left to right): Julia Poyer (sister of John Hornyak), Margaret Lozier (sister of John Hornyak), Hazel Lynch.



Water, the Franklin Marble, and Economics

Haig F. Kasabach

Most people receiving this newsletter know that the host rock for the rich zinc ore that was mined at Sterling Hill and at Franklin is known as the Franklin Marble. Those of you who are curious about the details of the origin of the ore and the Franklin Marble may go the Sterling Hill Mining Museum website (<https://www.sterlinghillminingmuseum.org/origin-of-the-ore-body>) for a detailed explanation.

While the focus at Sterling Hill was obviously mining the ore, the marble itself is a valuable commodity that has been quarried at several locations in Sussex County. The NJ Zinc Co. drilled exploratory borings in the marble throughout the area in an unsuccessful attempt to find another ore body. Geologists from the NJ Geological Survey (NJGS) and the US Geological Survey (USGS) utilized some of these cores in the mapping the subsurface of the region at a scale of 1:24,000 (1 inch = 2000 feet) in 1993.

The NJ Zinc Co. considered the Sterling Mine to be a very dry mine, in contrast to their Friedensville, PA mine, which pumped thousands of gallons of water per minute (gpm) from the Allentown Limestone, resulting in a dewatering of the Saucon Valley. When I visited the Friedensville mine I had to wear a slicker and rubber boots. At Sterling Hill, I never even got damp.

The deepest shaft at the Sterling Mine was about 2600 feet deep. There are approximately 35 miles of drifts and stopes under the Wallkill Valley. When I spoke with Bob Metsger, the geologist at the mine from the 1970s to its closing in 1986, he said they only pumped 100 to 200 gpm to keep the mine dry. To put this in perspective, a municipal well pumping from a rock aquifer in northern New Jersey usually can pump several hundred gpm from a 12- to 16-inch diameter well. Therefore, geologists consider the Franklin Marble to be a very impermeable formation. Only when a fracture is encountered can water move through the marble, and there were few fractures in the mine. However, the mine did have a weathered zone containing hydrozincite, which allowed some transmission of groundwater into the mine. Doug Francisco, a former Sterling Hill miner and current board member at

the Sterling Hill Mining Museum, recalls that much of the water being pumped was introduced into the mine with hydraulic fill. When the mine closed, Doug estimates that the water level rose about nine inches per day. Bernie Kozykowski, who also worked at the mine, confirmed that much of the water being pumped was from the hydraulic filling operations over the last two decades of mining.

Bob Hauck, one of the founders of the Sterling Mining Museum, recalls that when he and his brother, Richard Hauck, purchased the mine, the water was at the 1800-foot level and was rising about a foot per day. So it took many years before the groundwater in the mine finally stabilized at the water table, which allowed the Hauck brothers to extract minerals, equipment, and artifacts from the mine while it slowly flooded.

In 2009 the imperviousness of the marble attracted the attention of the Riverbank Power Co., a Canadian power company, which had been studying the geology of several areas in the United States with the intention of building a pumped-storage hydroelectric facility. Presently, there is a pumped-storage hydroelectric facility at Yards Creek in Warren County, NJ, but at that location they use a reservoir on top of Kittatinny Mountain and another at the bottom of the mountain. The Riverbank Power Co. was looking for a site where water could be stored at the surface and then released down a 2000-foot deep shaft through turbines into an underground reservoir. The water then would be pumped back up during times of low demand when they could purchase electricity at a cheaper rate. In this case the underground reservoir was designed to be about 2000 feet below the surface and nearly water tight. The Limecrest Quarry in Sparta, NJ seemed to be a perfect location for the surface reservoir, and if the marble was as tight as at Sterling Hill, it could be excavated and made into a good underground reservoir. However, neither the former Limecrest Co. nor the NJ Zinc Co. had ever explored more than a few hundred feet deep in this area. Richard Volkert, the geologist from the NJGS who had mapped this area in 1993, was very interested in this project since he had predicted that the Franklin Marble beneath the quarry had been cut by a

WATER, THE FRANKLIN MARBLE & ECONOMICS

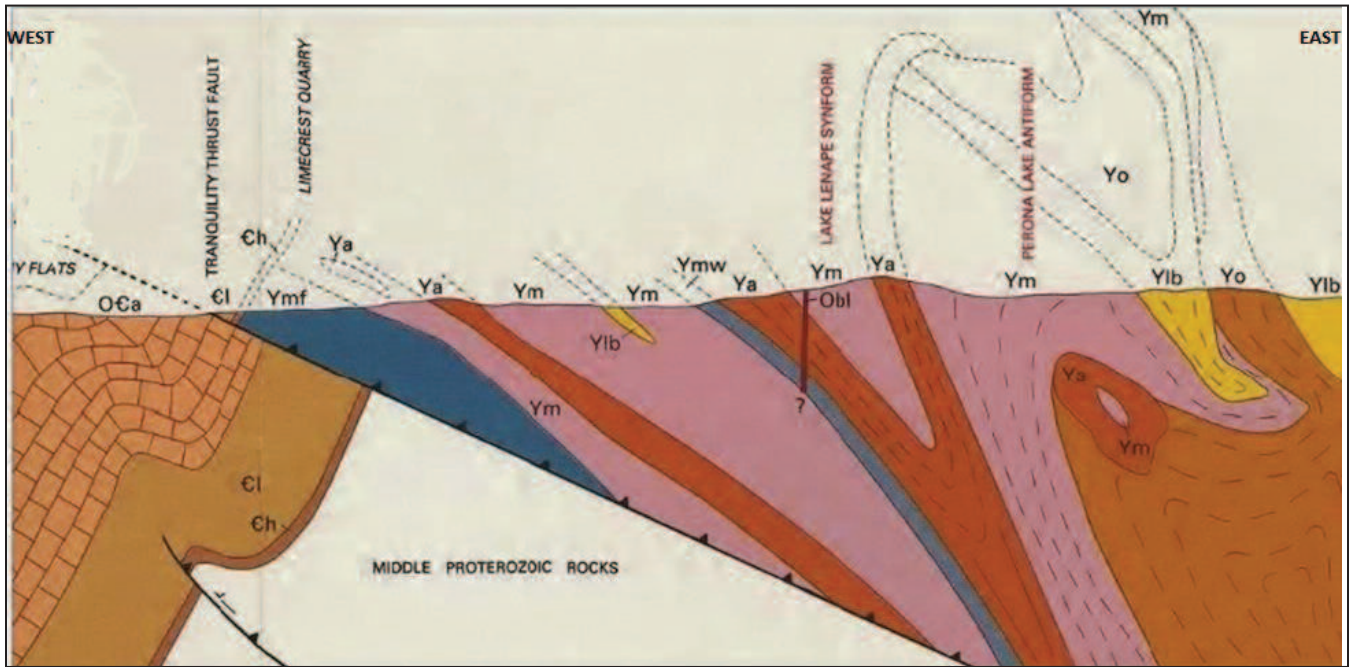
Continued from page 12

thrust fault which had transported the Precambrian marble and gneiss westward over the younger Paleozoic rocks. Jack Baum, a NJ Zinc Co. geologist, was of the same opinion, based on drilling farther to the southwest.

The Riverbank Power Co. embarked on a drilling program in 2009 to study the feasibility of the project, and drilled 2204-foot and 1997-foot core holes at the Limecrest quarry. The cores were logged and examined in detail by NJGS geologists Richard Volkert and Donald

Monteverde. They did indeed find the thrust fault at 1593 and 1422 feet in the cores and found younger Paleozoic dolomites beneath the fault which were highly fractured and would not be suitable for an underground reservoir. Therefore, the company abandoned the project. Had the thickness of the Franklin Marble prevailed to 2000 feet, Sussex County would likely have now been the home of a power generation company. 🐼

Haig F. Kasabach, a trustee at the Sterling Hill Mining Museum, practiced hydrogeology for 40 years and was the NJ State Geologist for 15 years prior to his retirement.

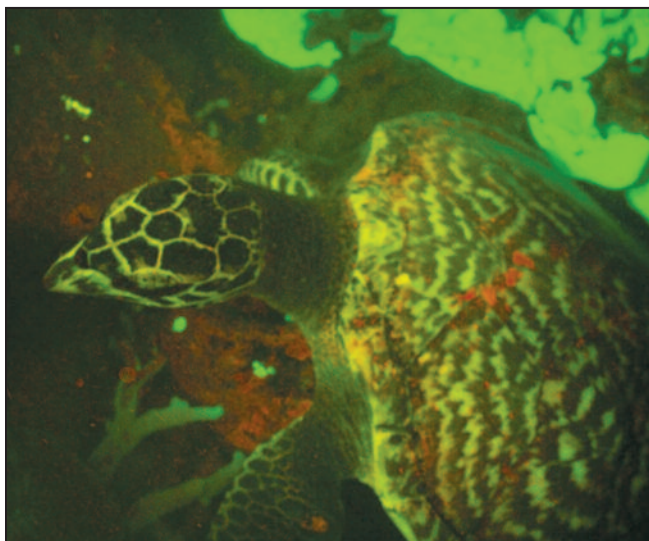


Cross Section from “Bedrock Map of the Newton East Quadrangle, Sussex County, NJ” by Avery Ala Drake, Jr. (USGS) and Richard A. Volkert (NJGS) 1993. The Franklin Marble is designated by the symbol “Ymf” on the section. The thrust fault (black saw-toothed line) is displayed pushing the older Precambrian igneous and metamorphic rocks from the east over the younger Paleozoic limestones and dolomites to the west. Borings at Limecrest (not shown) penetrated the Franklin Marble (shown in dark blue) and entered the underlying Paleozoic dolomites (shown in brown).

Fluorescent Animals

Winter Rosen

Most of you are familiar with and many of you are avid collectors of fluorescent minerals; but have you ever seen a fluorescent animal? Well, get ready because there are a handful of organisms that fluoresce just as vibrantly as our favorite rocks. Picture a sea turtle that biofluoresces the same colors as our fluorescent willemite and calcite!



The first biofluorescent reptile ever discovered was the critically endangered Hawksbill sea turtle, near the Solomon Islands.

We all have seen bioluminescence in the summer. Some of my fondest memories involve trying to capture those little bursts of light against the night sky -- fireflies. Bioluminescence is caused by a chemical reaction derived from the organism's own internal power source. This attribute is different than biofluorescence.

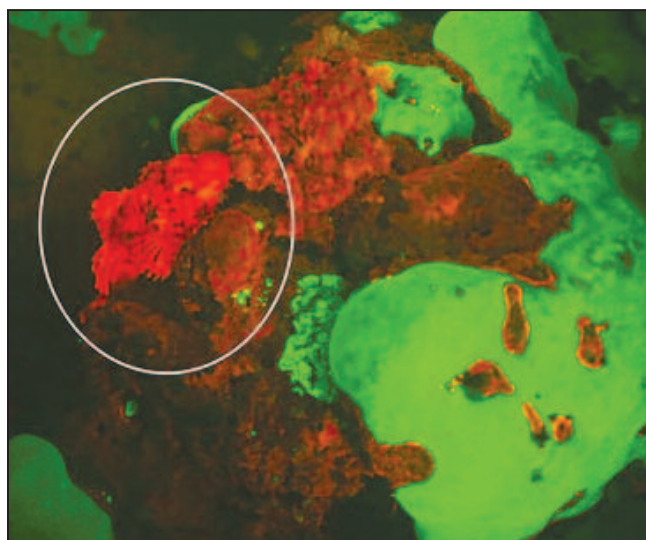
Biofluorescence works the same way as fluorescence in minerals: an organism absorbs ultraviolet light photons which collide with the organism's fluorescent molecules, typically proteins, and excites them, causing the electrons to jump up to a higher energy state. Once the electrons relax, that energy is then released in the form of new photons of light at a lower wavelength, in a natural process known as biofluorescence.

Biofluorescence is most commonly seen in marine organisms, such as corals, sponges, worms, crabs, fish, sea turtles, and sharks, among others. These underwater species

are capable not only of absorbing ultraviolet light in order to biofluoresce, but at deeper ocean depths they can absorb blue light and then transform the light into visible light of longer wavelengths, such as the color red. The key to seeing the biofluorescence is in their eyes that are specifically developed to see those wavelengths. Also, though it is rare, there are some terrestrial organisms that are capable of biofluorescence such as scorpions, birds, and a species of frog.

The mechanism of biofluorescence is not well understood, although there are many theories. Some scientists believe there is no evolutionary advantage and that some organisms biofluoresce simply because they can. On the other hand, some researchers believe there is an evolutionary advantage in biofluorescence, such as assisting in communication, camouflage, protection, and reproductive processes.

Corals use biofluorescence in two ways. First, it is a form of "sunblock" that protects them from ultraviolet radiation. Second, they use biofluorescence to feed the symbiotic algae that reside in the coral tissues. Biofluorescence enables corals to live at deeper depths. Research suggests that other biofluorescent marine organisms such as fish, crabs, worms, and the Hawksbill sea turtle, among others use biofluorescence to camouflage themselves within the biofluorescent corals, which in turn helps protect them from predators.



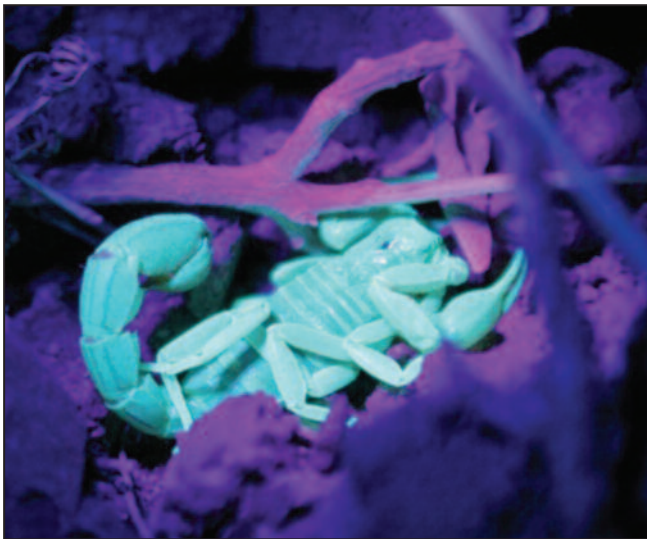
A fish displaying red biofluorescence camouflages itself against red biofluorescent coral.

Continues on page 15

FLUORESCENT ANIMALS

Continued from page 14

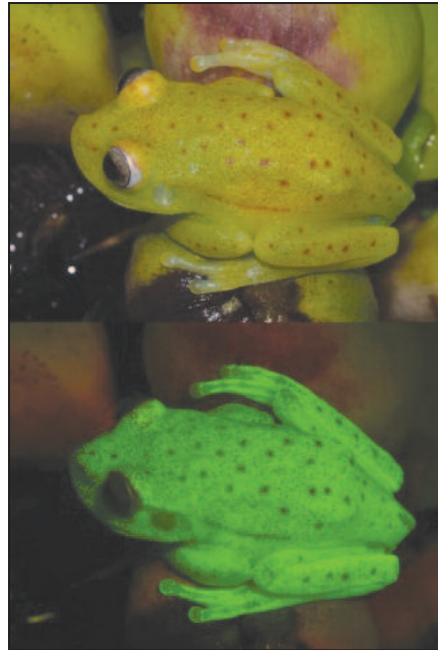
Scorpions are the terrestrial organisms most commonly known for being biofluorescent. Recent research has discovered that biofluorescence helps scorpions detect and avoid ultraviolet light. This was discovered by testing how scorpions reacted to ultraviolet light and blue-green light with their eyes unblocked and then with their eyes blocked. The researchers observed that scorpions had a strong urge to avoid the ultraviolet light with unblocked eyes and an even stronger urge to avoid blue-green light with blocked eyes. This suggests that scorpions use their whole bodies as light detection tools, by converting the ultraviolet light to a blue-green glow. This conversion acts as a signal that is transmitted to the nervous system. That signal can aid in helping the scorpion hide at night. For example, if any part of the moon's ultraviolet light was blocked from the scorpion's exoskeleton, it could better sense that a barrier or hiding place was nearby that is blocking the ultraviolet light source. Therefore, it is believed that scorpions use their biofluorescence for protection.



A biofluorescent scorpion from Saguaro National Park, AZ.

On the other hand, for some organisms biofluorescence may serve a reproductive purpose, in finding and attracting mates. Swell sharks and chain catsharks in particular are covered in fluorescent patterns that vary depending upon the sex of the shark. Both of these types of sharks are known to be nocturnal, solitary creatures, so it is believed that these varying fluorescent patterns could aid in finding mates and, in turn, aid in assisting in the survival of the species. In addition, recently the first amphibious biofluorescent species has been discovered,

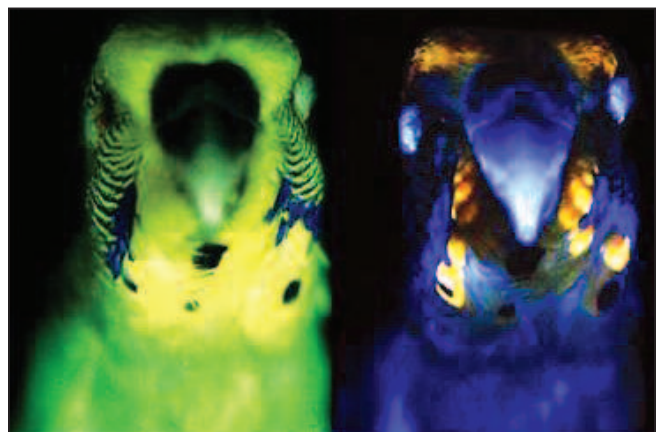
the South American polka dot tree frog. Researchers, again, are not sure why this frog biofluoresces, however, they are leaning toward the possibility that it aids in mating purposes as well.



The first image shows the South American polka dot tree frog under white light; the second image shows the frog biofluorescing under UV light.

One study done to test if biofluorescence plays a role in reproduction used budgerigar birds, budgies. Researchers tested whether budgies preferred mates with fluorescent crown and cheek feathers versus those without. They provided budgies of both sexes with their choice of two mates, one of which had its feathers coated with sunblock that prevented them

from fluorescing. Both sexes chose mates whose fluorescent feathers were visible, therefore proving there is a strong sexual preference for fluorescence. This suggests that fluorescent feathers are an adapted sexual signal, not just coloration. Therefore, it has been concluded that budgies use biofluorescence to choose their mates.



The image on the left is a budgie under white light. The image on the right shows the budgie biofluorescing under shortwave UV light.

Continues on page 16

FLUORESCENT ANIMALS

Continued from page 15

There is a whole world of biofluorescence that we simply do not fully understand. There seems to be a design in nature regarding biofluorescence in animals. Perhaps some organisms biofluoresce simply because their elemental makeup allows them to. More likely, however, biofluorescence may provide an evolutionary advantage that has aided in the survival of these species. 🐞

Sources:

<https://www.nytimes.com/2017/12/04/science/scorpions-fluorescence-ultraviolet.html>

<https://news.nationalgeographic.com/2016/04/160425-biofluorescence-glowing-catsharks-shark-eye-camera/>

<https://www.scientificamerican.com/article/fluorescent-feathers-elic/>

<http://www.luminescentlabs.org/science.html>

<https://news.nationalgeographic.com/2015/09/150928-sea-turtles-hawksbill-glowing-biofluorescence-coral-reef-ocean-animals-science/>

https://www.huffingtonpost.com/entry/first-fluorescent-frog_us_58d0a42fe4b0ec9d29dec973

Element Aluminum

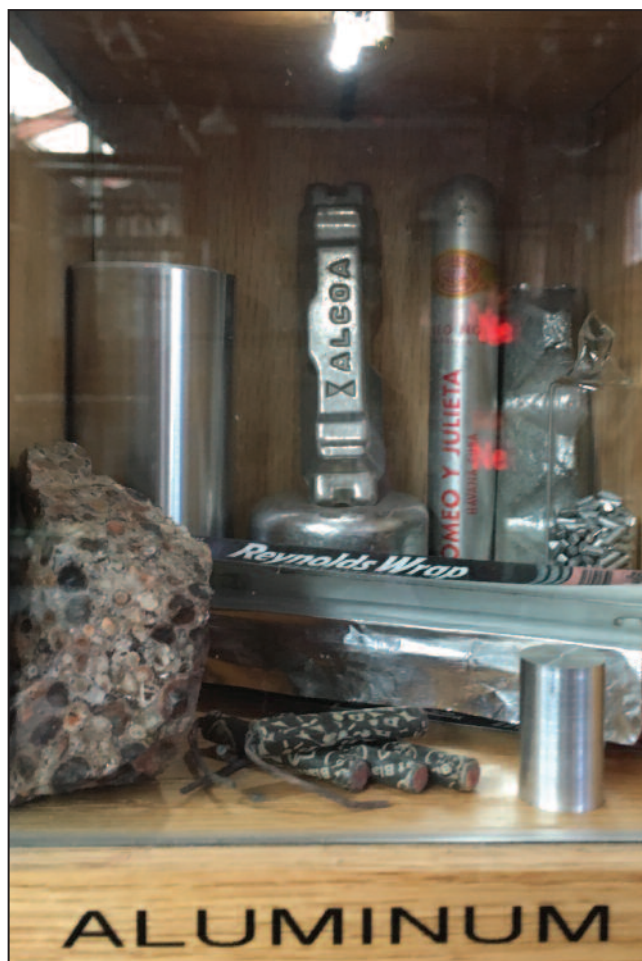
Gordon Powers

This ninth article in the continuing series on our periodic table of elements display in the Zobel Hall will focus on the familiar metal element, aluminum. The six-foot by ten-foot periodic table display in the Zobel Hall is a teaching tool that helps people understand the science behind the everyday items they use in their lives and the role of mining in producing those items.

Aluminum is a silvery-white, light-weight, low-density metal with an atomic number of 13, and is rarely found in its pure elemental form. The chemical symbol for aluminum is Al. It is the third most abundant element in the Earth's crust, and is the most widely used non-ferrous metal.

The first use of aluminum was in the fabric industry in the form of the compound alum, from which the name of the element is derived. The element was first isolated in 1824 by Hans Orsted, the Danish chemist and physicist. The early attempts to isolate aluminum produced only small quantities, and as such, the metal was worth more than gold at the time. It was not until 1856 that the first industrial production of the metal was established by the French chemist Henri Deville, after which the price of the metal dropped dramatically.

The only commercial ore of aluminum is bauxite, an amorphous clayey rock (not a mineral) that consists



Continues on page 17

ELEMENT ALUMINUM

Continued from page 16


largely of hydrated alumina, with variable proportions of iron oxides. You can see a very large mass of bauxite in the Zobel Hall. Most of the world’s supply comes from Australia, China, Guinea, and India, with less than one percent of total world production coming from the United States.

While bauxite is not found at Sterling Hill or at Franklin, the element aluminum is found in numerous minerals from these two sites, with corundum probably the best-known mineral for local collectors.

The production of aluminum from bauxite is an energy-intensive process; however, recycling requires only five percent of the energy needed to produce it from the ore, thus making the recycling of aluminum very attractive.

Aluminum finds wide use in the transportation industry, in cars, trucks, ships, trains, and aircraft. Though it has no known biological use, aluminum is well-tolerated by plants and animals, making it useful in packaging such

as in cans and foils. It is used in building and construction, where its light weight and corrosion resistance are important (e.g., for windows, doors, siding, and roofing). The high electrical conductivity, corrosion resistance, and mechanical strength of aluminum make it useful for motors, generators, transformers, and conductor alloys. In the form of alumina (aluminum oxide) it is widely used as an abrasive. Other compounds of aluminum are used in the chemical industry.

As you can see, aluminum finds many uses in our modern world and can impact our lives in many ways. If you look closely at the items you use throughout your day, you will see how aluminum might play an important part. You will not have to look very far to find it; it is probably all around you. And if you collect minerals at Sterling Hill or Franklin, you will have a connection to the element, aluminum. 

Gordon Powers, a trustee at the Sterling Hill Mining Museum, worked for the US Army as a civilian mechanical engineer for almost 39 years before retiring in 2017.

The Origin of My “Stuff” Found at the Sterling Hill Mining Museum

Missy Holzer

My everyday “stuff” somehow looks a little different after touring the Sterling Hill Mining Museum (SHMM). From pennies, to galvanized metals, to ointments, and dietary supplements, zinc seems to be everywhere. Within our hectic lives we look to solve problems using materials without thinking about the origin of all the raw resources that go into making the materials. Who knew that the “stuff” that protects me from the damaging rays of the sun contains zinc! Beyond knowing that zinc is in my sunscreen, I never gave much thought to where the zinc originated. A tour of SHMM took care of that.

A trip back in time revealed the origin of the element zinc, and the challenges that were overcome in acquiring it. Stepping into the mine is a step back in time to the eerie darkness hiding the precious ore. Armed with flashlights and fluorescent lamps, the past comes alive for all who enter. Within the tunnels mannequins dressed as miners remind us that mining is not only hard work, but dirty as well. Knowing that the tunnels were blasted, and

the huge remaining boulders needed to be cleared to access the ore, it was a marvel that humans were involved in such challenging work. However, with the help of engineering, much of this feat was accomplished mechanically, from removing the ore to shipping it for processing elsewhere.

Remnants of the past are found elsewhere at SHMM. Not only did Zobel Hall delight the mineral enthusiast in me, but it reminded me of how the “stuff” of today has made my daily life easy compared to the past. Zobel Hall was the first and last stop of the day for the miners who used the facilities to store their clothes. The wire baskets toward the ceiling are where wet and dirty clothes were hung to dry overnight. The mining equipment and machinery displayed in the museum emphasized the ingenuity in mineral extraction. In addition, the “living” periodic table provided me with a reality check that our elements are more than static atoms arranged in a special order based on their characteristics. Elements make up my “stuff!” More “stuff” abounded in the Warren

Continues on page 18

ORIGIN OF MY STUFF

Continued from page 17

Museum of Fluorescence where, with the flick of an ultraviolet light, my "stuff" lit up, with the help of a little science. The cases were filled with everyday materials and mineral specimens that further connected me to the origin, science, and engineering of zinc.

Each time I venture into SHMM I remember our mining past and think about our future needs for natural resources. It is hard work; hidden work overshadowed by

the materials we purchase and use every day. Perhaps if everything we use had an ingredient list which included the raw materials they contained, we would be more conscientious in making those purchases. I know I would be. 🐞

Missy Holzer, PhD, a trustee at the Sterling Hill Mining Museum, has taught Earth and Space Science for over 30 years to high school and college students. She also provides professional development for teachers on many topics.

Ghosts in the Sterling Mine

Ray Latawiec

Here is a little departure from the normal, that leads us to the paranormal. For those of you who believe in ghosts, my job is easy; for those of you who don't (yet), consider this article as a key to unlock your mind to what many already believe to be true. My purpose, however, is not to convince you one way or the other. I merely present some "facts," or at least what appear to be the "facts" surrounding some really weird and other-worldly experiences in and around the mine, from a variety of sources. These "facts" come from my 15 years or so as a tour guide at both the Sterling Hill Mining Museum and the Franklin Mineral Museum, as well as from stories relayed to me by other tour guides and the general public. I never bring up the subject of ghosts, so as not to influence anyone's tendency for "imaginative tales." Only when the stories are volunteered independently do I give them any attention.

I have separated these accounts into four distinct categories – sight, sound, smell, and sensation. I will address the categories separately, relating specific events, but without quoting any particular person. I decided to tell this story after I had noticed that some tour guides did not want to be alone when closing the mine at the end of the day, insisting on having someone accompany them. Some would not even dare close the mine at all; must be the ghosts after all! This is by no means a scientific study, but rather a compilation of strange and unusual events, acquired by word-of-mouth, as well as some of my own personal experiences. Call us crazy, and I would be the first to agree with you. I will continue to respect those who had the courage to relate their stories to me, but they will remain anonymous.

Sights Unseen?

First let us consider the "sightings," which seem to be the most common of the eerie occurrences. These sightings, mostly from the people on tours, seem to involve something quite unusual, at similar locations. The sightings often involve wispy, smoky, or foggy shapes and motions, occurring mainly in the main adit, at the central shaft station, or near the grizzly. Some even claim to have taken pictures of these sightings, and those that I have seen resemble condensation in particularly humid areas. With some imagination, they actually do resemble human forms. But this is where the imagination comes into play. For instance, when looking at cloud formations no two people will see the same thing. But then again, these are not clouds they are seeing in the mine, but in their mind, are truly paranormal occurrences. I passed around a photo taken by one person to others on that tour, but interestingly, no one else saw exactly the same object. Some people may get creeped-out, so as a tour guide, I downplay such events, and tell the "channelers" to see me privately. After all, not everyone believes in ghosts. What is strange, however, is why anyone would be creeped-out in the first place if they categorically deny the existence of these spirits. Funny though, once the subject is broached, more and more people experience more and more unusual things. Is this group hysteria, or the power of suggestion? Perhaps. I think some people want to believe they saw what they saw, or didn't see what they thought they saw, or saw nothing at all. Confused? So am I.

Other anomalies that show up from time to time are the glowing "orbs" that seem to hover and flit about in the

Continues on page 19

GHOSTS IN THE STERLING MINE

Continued from page 18

distance, but never up close; almost like reflections through a window created by a passing car. They also have been described as large fireflies, with an eerie glow blinking and bobbing, much as you would imagine them in your backyard on a summer night. Sometimes even different colors are perceived. The objects never allow you to get too close, and as you approach them, they simply vanish into thin air. This occurs mainly in the Landmesser Tunnel, approaching the old stope, and in the lake area. I was shown a picture taken of "orbs," and with some imagination, they appear just as I described them above. This is another example of reported occurrences in the mine that are inexplicable, but worthy to report. I personally have never experienced them, but these "orbs" are quite real to some people, and have appeared more than once. And again, not everyone sees them.

Sounds of Silence?

Now to the sounds heard in the mine. I have never seen a UFO, nor have I ever been abducted by aliens, at least that I can remember. I consider myself to be of sound mind, even though I worked for 25 years in law enforcement. Part of my job as a tour guide is to open the mine at the beginning of the day and to close it at the end of the day. The first time I noticed a really weird sound occurred years ago at the Franklin Mineral Museum. Closing the mineral dump, I would usually check the cars in the parking lot, to make sure all collectors had left the premises. Then, I would physically inspect the property before locking up. On several occasions, I heard distinct hammer blows, of the sort you would expect from rock hounds doing their thing. Convinced there were poachers on the dump, I would go back down, but would see no one there; yet I would still hear the sound of rocks cracking. Nothing was seen; just the sounds. Needless to say, I dismissed this as imaginary; and I with my goose bumps would depart swiftly back to the lobby. I experienced these same weird sounds several times; and I jokingly referred to them as coming from the spirit of miner and collector, Nick Zipco.

The eerie sounds at Sterling Hill sometimes were similar. There again I would hear that infernal clanging of the hammer, coming from the Passaic Pit, but no one was there. On several occasions, mostly when opening the mine for tours, those distinct hammer blows were echoing throughout the mine, particularly when I approached the grizzly. At first I thought Tom Hauck was there doing his routine maintenance, but I realized there were no lights on yet. I called out, but there was never anyone

there. These sounds were real and unreal at the same time. It was a cool experience for me, or should I say chilling, as I could never pinpoint the location of the sounds. I was never afraid, and was always amused, and certainly puzzled by those eerie sounds. Other persons have told of hearing sounds, such as metal objects falling, bells ringing, heavy machinery moving, footsteps, dragging noises, explosions, and even those hammer blows that are so dear to my ear. The locations always varied, but most often were at the central shaft station and the powder magazine; and here again, certainly not experienced by all. It would usually happen that one person would ask me what the noise was. I wouldn't challenge that person, and would advise that I didn't hear anything. If they persisted, however, I would ask others in the tour group if they had heard the sound. Some would say yes, others would say no, and I would usually end it by telling them it could be the ghosts of "Luke the Spook" or "Bicycle Pete" (see article by Dick Bostwick in the fall 2017 edition of the Sterling Hill newsletter). The guests invariably would ask me to elaborate, and I would tell the ghost stories, which generally were enjoyed by most in the group.

A rather rare occurrence, but worthy of mention, are the sounds of insects. Crickets, buzzing mosquitoes, and bees humming are some of the sounds that infrequently have haunted some people in the mines. One person commented that we needed to bring in an exterminator before the wasps got out of control. I assured her that I would get right on it. She was actually surprised that nobody else complained.

Other weird sounds usually, or should I say unusually, occur in the GeoTech Center. Several times, after closing the metal door from the old stope and proceeding into the Warren Museum of Fluorescence, I heard the metal door swinging open, even after I swore I had locked it. Also, if that wasn't spooky enough, sometimes after setting the alarm in the Zobel Hall, I heard doors slamming shut, even after they were locked. I always checked, but never could account for the aberrant behavior of the doors.

Uncertain Smells?

Weird odors in the mine are less frequently encountered, but are rather interesting none-the-less. Children seem to sense the smells first. "It stinks in here, like rotten eggs!" is the most common reaction. After explaining it wasn't me, and probably not the person next to them, I would tell them it is simply the smell of mother earth. "Sulfur water" is common in Sussex County. When asked to describe the odors, the most common description is of rotten eggs and skunky smells, that might emanate from

GHOSTS IN THE STERLING MINE

Continued from page 19

accumulating pools of water, particularly around the grizzly and the lower stope. That would be easy to explain. But other than the "sulfur water" smell, I have had people tell me they smell smoke from candles that have been blown out, exhaust fumes, and wood burning, among others. Those familiar with firearms swear it smells like spent gun powder. One soul I can remember smelled hamburgers burning on the grill! Another comical one was described as digested cabbage, the next day. I recall one person actually having to leave the tour because of a horrific odor, that no one else detected. So, the phenomenon of the smells can be quite personal I suppose, depending on the sensitivity of one's sense of smell, and their imagination.

Sensational Sensations?

Finally, there are some odd experiences in the mine that do not fit into any of the above categories. I would describe these sensations as a "presence" or a feeling that someone, or something is behind you or around you. This usually is accompanied by the observer getting goose bumps, or by strange breezes, or even rapid changes of temperature. Some even get the feeling that something or someone passed close by, nudging them as they did. Once, a woman was convinced that something was crawling in her hair. That gave us all a scare. But after we checked carefully, there was nothing there. These are less common, but worthy of noting as eerie mine experiences.

I leave you with this thought. Having heard the testimonies of many sensible people throughout the years, and having corroborated some of them with my personal experiences, I conclude that some strange things may be happening in the mine at Sterling Hill. The vast majority of these occurrences seem to be in the original parts of the mine, that existed before the mine shut down in 1986. Coincidence? Maybe. These sensed spirits seem to be neither evil nor harmful; just playful, and happy to know you feel their presence. Not one person I spoke to about this ever felt threatened or afraid of the encounter. At least none who would admit it. Creeped-out maybe, but nothing more. Even the newly hired tour guides eventually get over it. As for myself, I have never believed in ghosts. That is, until I started working at Sterling Hill and Franklin. By the way, if you have anything to add to these stories, I would love to hear from you, so I could add your experiences to my ever-growing collection of mine macabre. As for now -- a haunting we will go! 🐛

Ray Lataweic is a long-time collector of Franklin and Sterling Hill minerals, a grandson of a Polish coal miner, and is enjoying his 16th year as a tour guide at Sterling Hill. He retired from the NJ State Police after a 25-year career, leaving as the Station Commander of the Sussex Barracks in Augusta, NJ. He graduated from Moravian College with a BA in Criminal Justice.

Featured Mineral - Clinohedrite

Robert A. Horn

The featured mineral in this issue of the Sterling Hill newsletter is clinohedrite, a hydrous calcium zinc silicate. Clinohedrite is commonly colorless, but also can be white to pale amethyst in color. It fluoresces a rich orange under shortwave ultraviolet light, and is a great favorite of fluorescent mineral collectors. This rare mineral typically occurs in veinlets or along fractures, usually as a coating. It has a perfect cleavage, and when found in crystals (very rarely), it has a brilliant luster. Clinohedrite has a Mohs hardness of 5.5 and specific gravity of 3.33. It frequently is associated with minerals such as hardystonite, calcite, andradite, diopside, franklinite, and willemite.

Clinohedrite was first described and named by Samuel L. Penfield and Harry W. Foote in 1898. The name refers to the mineral's crystal morphology; from the Greek "kline" for incline, and "hydra" for face. Clinohedrite is found at Franklin, NJ (the type locality), Gila County, AZ, and Gansu Province, China; but not at Sterling Hill.

This particular clinohedrite specimen is from the Joshua Barnes collection, acquired by the Sterling Hill Mining Museum in December 2016. Joshua Barnes had a fluorescent display in his basement which contained several large and choice Franklin specimens. The Sterling Hill Mining Museum has saved about a dozen of these specimens for possible future display in the museum.

Continues on page 21

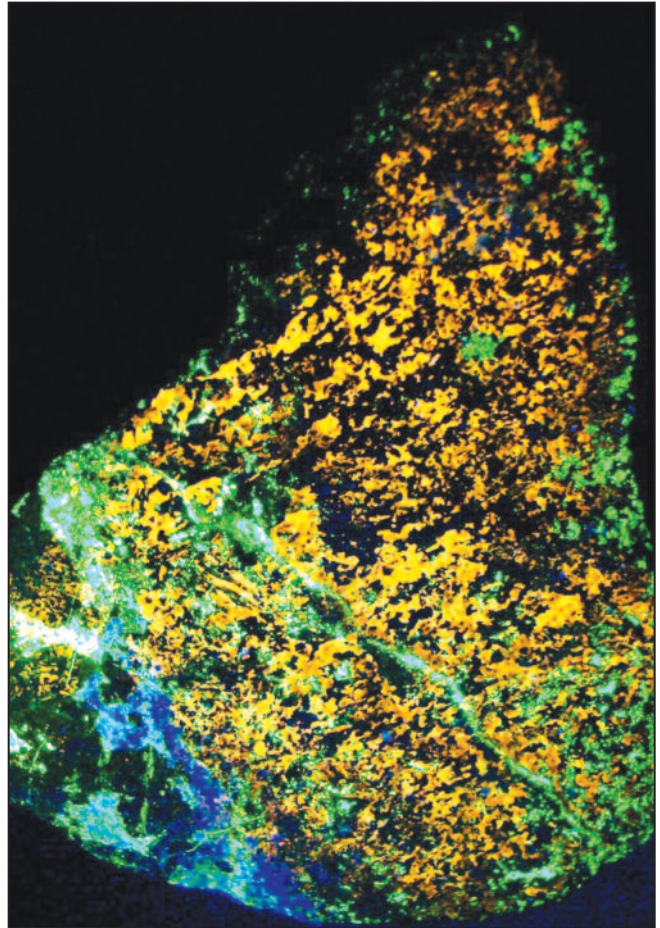
FEATURED MINERAL - CLINOHEDRITE

Continued from page 20

Forty-nine worldwide specimens from the Barnes collection have been selected for display in Zobel Hall, adjacent to the Oreck mineral collection. The Barnes collection minerals in this display are very colorful, with wonderful specimens from classic localities. The next time you are at Sterling Hill, check out this new exhibit. The museum thanks the Wolf family for enabling the Sterling Hill Mining Museum to acquire this splendid collection.

[Ed. Note: Several choice specimens from the Barnes collection are now available for purchase. Please contact Sterling Hill President and Executive Director, Bill Kroth, for more information.]

Robert A. Horn, a trustee at the Sterling Hill Mining Museum, has a degree in marketing from the University of Massachusetts, Dartmouth. He is past president of the North Jersey Mineralogical Society, and has been a mineral collector for over 45 years.



Clinohedrite (fluorescent orange) with willemite (fluorescent green) and hardystonite (fluorescent violet). This specimen is shown photographed in white light on the left, and under shortwave ultraviolet light on the right. It is 23 x 21 x 15 cm, and is from the Joshua Barnes collection; now in the collection of the Sterling Hill Mining Museum.

STERLING HILL MINING MUSEUM Calendar of Events

Saturday, April 27, 2019

**Annual New Jersey Earth Science
Association (NJESA) Gem and Mineral
Show**

Littell Community Center, 10-12 Munsonhurst
Road, Franklin, NJ

9:00 AM - 5:30 PM (indoors); 8:00 AM - 5:30
PM (outdoor swap/sell)

Saturday, April 27, 2019

Sterling Hill Garage Sale

Christiansen Pavilion, Sterling Hill Mining
Museum, 30 Plant Street, Ogdensburg, NJ

10:00 AM - 3:00 PM

Saturday, April 27, 2019

Annual Show Banquet and Auction

GeoTech Center, Sterling Hill Mining Museum,
30 Plant Street, Ogdensburg, NJ

Banquet begins at 6:30 PM; attendance limited
to 60 people; tickets are \$20.00 per person

Sunday, April 28, 2019

NJESA Gem and Mineral Show

Littell Community Center, 10-12 Munsonhurst
Road, Franklin, NJ

10:00 AM - 5:00 PM (indoors); 9:00 AM - 5:00
PM (outdoor swap/sell)

Sunday, April 28, 2019

Sterling Hill Garage Sale

Christiansen Pavilion, Sterling Hill Mining
Museum, 30 Plant Street, Ogdensburg, NJ

10:00 AM - 3:00 PM

Sunday, April 28, 2019

**Mineral Collecting at Sterling Hill (daytime
only)**

9:00 AM - 3:00 PM

Collecting is allowed on the Mine Run dump,
in the Passaic pit, and “saddle” areas. Bring
sturdy footwear, a strong hammer (carpenter’s
claw hammers not allowed), and eye protec-
tion. A dark room with a shortwave ultraviolet
light is provided on-site for inspection of fluo-
rescent minerals.

Fee: \$5 admission plus \$2.00 for each pound of
minerals taken. Fee does not include mine tour.

Age Requirements: Must be age 7 or older to
collect on the Mine Run dump; must be age 13
or older to collect elsewhere.

Sunday, May 26, 2019

**Mineral Collecting at Sterling Hill (daytime
only)**

9:00 AM - 3:00 PM

Collecting is allowed on the Mine Run dump,
in the Passaic pit, and “saddle” areas. Bring
sturdy footwear, a strong hammer (carpenter’s
claw hammers not allowed), and eye protec-
tion. A dark room with a shortwave ultraviolet
light is provided on-site for inspection of fluo-
rescent minerals.

Fee: \$5 admission plus \$2.00 for each pound of
minerals taken. Fee does not include mine tour.

Age Requirements: Must be age 7 or older to
collect on the Mine Run dump; must be age 13
or older to collect elsewhere.

CALENDAR OF EVENTS
Continued from page 22

Saturday June 15, 2019

**Mineral Collecting at Sterling Hill
(Nighttime: Sterling Hill Mining Museum
members only)**

6:00 PM - 10:00 PM

Collecting is allowed on the Mine Run dump, in the Passaic pit, and “saddle” areas. Bring sturdy footwear, a strong hammer (carpenter’s claw hammers not allowed), and eye protection. A dark room with a shortwave ultraviolet light is provided on-site for inspection of fluorescent minerals.

Fee: \$5 admission plus \$2.00 for each pound of minerals taken. Fee does not include mine tour. Age Requirements: Must be age 7 or older to collect on the Mine Run dump; must be age 13 or older to collect elsewhere.

Sunday June 23, 2019

Mineral Collecting at Sterling Hill (daytime only)

9:00 AM - 3:00 PM

Collecting is allowed on the Mine Run dump, in the Passaic pit, and “saddle” areas. Bring sturdy footwear, a strong hammer (carpenter’s claw hammers not allowed), and eye protection. A dark room with a shortwave ultraviolet light is provided on-site for inspection of fluorescent minerals.

Fee: \$5 admission plus \$2.00 for each pound of minerals taken. Fee does not include mine tour. Age Requirements: Must be age 7 or older to collect on the Mine Run dump; must be age 13 or older to collect elsewhere.

Sunday July 28, 2019

Mineral Collecting at Sterling Hill (daytime only)

9:00 AM - 3:00 PM

Collecting is allowed on the Mine Run dump, in the Passaic pit, and “saddle” areas. Bring sturdy footwear, a strong hammer (carpenter’s claw hammers not allowed), and eye protection. A dark room with a shortwave ultraviolet light is provided on-site for inspection of fluorescent minerals.

Fee: \$5 admission plus \$2.00 for each pound of minerals taken. Fee does not include mine tour. Age Requirements: Must be age 7 or older to collect on the Mine Run dump; must be age 13 or older to collect elsewhere.

Sunday, August 25, 2019

Mineral Collecting at Sterling Hill (daytime only)

9:00 AM - 3:00 PM

Collecting is allowed on the Mine Run dump, in the Passaic pit, and “saddle” areas. Bring sturdy footwear, a strong hammer (carpenter’s claw hammers not allowed), and eye protection. A dark room with a shortwave ultraviolet light is provided on-site for inspection of fluorescent minerals.

Fee: \$5 admission plus \$2.00 for each pound of minerals taken. Fee does not include mine tour. Age Requirements: Must be age 7 or older to collect on the Mine Run dump; must be age 13 or older to collect elsewhere.

CALENDAR OF EVENTS

Continued from page 23

Saturday, September 28, 2019

Franklin Gem and Mineral Show

Littell Community Center, 10-12 Munsonhurst Road, Franklin, NJ

9:00 AM - 6:00 PM (indoors); 7:30 AM - 6:00 PM (outdoor swap/sell)

Saturday, September 28, 2019

Annual Show Banquet and Auction

Lyceum Hall, Immaculate Conception Catholic Church, Franklin, NJ

Banquet begins 6:30 PM; tickets are \$20 per person.

Saturday, September 28, 2019

Sterling Hill Garage Sale

Christiansen Pavilion, Sterling Hill Mining Museum, 30 Plant Street, Ogdensburg, NJ

10:00 AM - 3:00 PM

Sunday, September 29, 2019

Franklin Gem and Mineral Show

Littell Community Center 10-12 Munsonhurst Road Franklin, NJ 07416

10:00 AM - 5:00 PM (indoors); 9:00 AM - 5:00 PM (outdoor swap/sell)

Sunday, September 29, 2019

Sterling Hill Garage Sale

Christiansen Pavilion, Sterling Hill Mining Museum, 30 Plant Street, Ogdensburg, NJ

10:00 AM - 3:00 PM

Sunday, September 29, 2019

Mineral Collecting at Sterling Hill (daytime only)

9:00 AM - 3:00 PM

Collecting is allowed on the Mine Run dump, in the Passaic pit, and "saddle" areas. Bring sturdy footwear, a strong hammer (carpenter's claw hammers not allowed), and eye protection. A dark room with a shortwave ultraviolet light is provided on-site for inspection of fluorescent minerals.

Fee: \$5 admission plus \$2.00 for each pound of minerals taken. Fee does not include mine tour.

Sterling Hill Mining Museum Mission Statement

Our mission is to tell the story of the Sterling Hill Mine and to inspire lifelong learning about earth sciences, engineering, and the responsible use of the Earth's nonrenewable resources.

What We Do

1. We inspire students to pursue careers in science and engineering.
2. We inspire people to be thoughtful and responsible stewards of our environment.
3. We are committed to preserve our historic facility, rock and mineral samples, artifacts, and records to support research and foster understanding of this unique geologic area.
4. We provide visually stimulating, hands-on experiences in earth science and technology in an historic, immersive, real-world setting.
5. We promote an understanding of human involvement in our environment and how science and technology relate to that connection.

HERCULES EXPLOSIVES



A World's Record With Hercules Dynamite

Not long ago this crew hung up a record that will be hard to beat. They sunk 261 feet of a three-compartment shaft in 31 days. World's records are few and far between and this one was made with the help of Hercules 35% and 50% L. F. Gelatin dynamite.

You may not be working for a world's record but you *are* working for a record of ore production in your own mine. Speed in mine operation depends to a large degree upon the use of explosives that fit your working conditions. No matter what those conditions are, one of the many Hercules dynamites will exactly fit your needs.

We should be glad to demonstrate *in your own mine* the efficiency and economy of using Hercules Dynamites or blasting gelatins.

HERCULES POWDER CO.

Chicago	St. Louis	New York
Pittsburg, Kan.	Denver	Hazleton, Pa.
San Francisco	Salt Lake City	Joplin
Chattanooga	Pittsburgh, Pa.	Wilmington, Del.

Several Hercules Powder Co. artifacts were donated recently to the Sterling Hill Mining Museum by Lorraine Stickle. Her late husband, David, was an employee at the Hercules plant in Kenvil, NJ. His dream was to build a museum dedicated to that plant. Please check out these artifacts in our Zobel Hall.



The Hercules Powder Co., located in the Dover, NJ area, was a major supplier of explosives for mines in New Jersey. This wooden box contained longer sticks of explosives that may have been used in quarry-type operations.



The "Nitro Buggy" was used to transport batches of nitroglycerin. Rather than risk a mishap in a pipeline that could destroy a large area of the complex (as the pipe would act as a fuse), isolated batches of nitroglycerine were transported on these special wooden carts. Note the large air-filled rubber tires to cushion the cargo.



This photograph from the mid 1950s shows part of the new shaft development -- the doors leading out of the adit into the lower yard. Blasted material in the lower yard can be seen in the background. Rock (not ore) was being blasted in the lower yard to make it level for the train tracks. This rock was trammed into the adit, dumped onto the grizzly rail, diverted below, then used for filling stopes and pillars throughout the mine.

Sterling Hill Mine Facts

- Nearly all of the 35 miles of underground workings in the Sterling Hill mine were in total and perpetual darkness. The only light came from the miners' battery-operated cap lamps, which effectively limited their vision to a cone of light radiating from their foreheads.
- The temperature in the mine is a constant 55 degrees, regardless of the weather or temperature outside the mine.

Sterling Hill Mining Museum

30 Plant Street • Ogdensburg, NJ 07439-1126

NON-PROFIT ORG.

U.S. POSTAGE

PAID

Franklin, NJ
Permit No. 30

CHANGE SERVICE REQUESTED

For more information contact:

Membership Chairman

Sterling Hill Mining Museum

30 Plant Street

Ogdensburg, NJ 07439-1126

Phone: 973-209-7212

Fax: 973-209-8505

www.sterlinghillminingmuseum.org

info@shmmuseum.org



Home of the Thomas S. Warren Museum of Fluorescence, the official fluorescent museum recognized by the Fluorescent Mineral Society