



Spring/Summer 2022  
Vol. 31 No. 1



# STERLING HILL NEWSLETTER

*Recipient of the 1999 Carnegie Mineralogical Award*



Locomotive #2074 approaching the Sterling Mine from the north. The Lehigh and Hudson River (LHR) engines all were renumbered after the railroad was absorbed into Conrail in 1976. Locomotive #2074 was formerly LHR #29, the #2073 was formerly LHR #28. Conrail used these locomotives for only a short time, and they were replaced with newer models. See the article in this newsletter by Jeff Wilson titled: *The Railroads That Served the Sterling Mine: A Look Back in Time.*

[www.sterlinghill.org](http://www.sterlinghill.org)

*A nonprofit foundation in furtherance of mining*

*preservation, scientific research and earth science education.*





# President's Message

Bill Kroth

During the past two years, we have tried to maintain an optimistic view regarding how we will operate at the Sterling Hill Mining Museum and get back to "normal" once the pandemic is over. We have greatly modified all aspects of our operations during the pandemic, while giving tours and trying to continue educational presentations and programs. Our main business and educational mission are closely tied to school class trips. In 2019, we typically averaged 40 school class trips every week during the school year; but now we are lucky to get four class trips in a month! Weekend general public tour attendance was over 200 on a typical Saturday or Sunday; that dwindled in the fall of 2021 to as few as 40.

Gift Shop and Snack Bar sales have always been a big part of our operation; accounting for half of our revenue prior to the pandemic. We have made modifications to the Gift Shop and Snack Bar by limiting tour group sizes, selling through an exterior window, and putting a small sales kiosk adjacent to the Christiansen Pavilion. But the set-up effort in relation to the number of customers has made this barely cost-effective.

Finally, the physical risk to our employees is a continuing major concern for me; whether from COVID itself, or from concerns raised by visitors about masks, proof of vaccination, or social distancing. As a result, we had been closed for tours; but the COVID numbers continue to improve, so we opened for tours on a limited basis, beginning April 2, 2022. We hope to open more substantially later in spring.

During the past 30 years that Denise and I have been involved in Sterling Hill, we never imagined that something so profound could affect our operations for such an extended period of time. Despite it all, the museum has continued to improve its programs, presentations, exhibits, and reputation over the years; and there are some highlights over the past six months.

- The second annual Halloween Haunted Mine Tour was again a great success, made possible by many great volunteers.
- The North Jersey Mineralogical Society has made Sterling Hill their "second home" in 2021, hosting meetings, mineral shows, and digs at the museum.

- The museum acquired or received through donations a number of mineral collections, which help replenish the annual Garage Sale event, Gift Shop sales, and even the material on the Mine Run Dump.
- Dr. Earl Verbeek and his interns have continued to make use of the excellent laboratory facilities and analytical equipment at Sterling Hill, supporting several projects and publications. Earl reports that he is progressing nicely on his study of faulting in the Sterling Mine.
- The museum recently acquired a very large collection (over 10,000 labeled specimens), donated by local collector Jim Rumrill of Towaco, NJ. We are now inspecting and organizing this wonderful collection in a newly refurbished and secured room in our Kolic GeoTech Building. The collection has an amazing depth of mineral representation from local to worldwide species and will be kept intact as a great reference collection. Many of the world-class fluorescent minerals will be moved into displays in our Warren Museum of Fluorescence. For more information, see the article on the Rumrill Collection in this issue.

Finally, Vandall King's long-awaited book (*The Mineralogy of Franklin and Ogdensburg, New Jersey: a Photographic Celebration*) has been published, featuring a chapter highlighting the Sterling Hill Mining Museum, and illustrated throughout with thousands of beautiful photographs of the distinctive minerals from the Franklin/Sterling Mining District, shown in daylight and under UV light. It took a long time to produce, but it was well worth the wait. It is a true masterpiece, encompassing three volumes, and 1400 pages! The books are available for purchase at the Sterling Hill Mining Museum and the Franklin Mineral Museum.

The Sterling Hill Mining Museum opened on April 2 for public tours. Reservations are required for weekend public tours so that we may gauge how many guides will be needed. Beginning April 2, tours for groups also continued and are available any day. We hope to have all aspects of the museum fully open later in April.

Derek Yoost and Jeff Wilson, both members on our Advisory Council will be "point people" for the garage sale on April 23 and 24 in the Christiansen Pavilion. The

**PRESIDENT'S MESSAGE**

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North Jersey Club and SHMM will be selling minerals and other items; this should be our biggest garage sale yet.

Sterling Hill's recovery will be slow, and this school year will end with only a few more schools participating before the summer. Let's hope things accelerate in the fall. With all of the many problems including inflation, high gas/diesel prices, COVID, etc. we must simply ride this out; but we will work hard and be hopeful that Sterling Hill will return fully, and better than ever. 🐛

*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 seventh grade and an interest in amateur astronomy in high school. Now in his "golden years" 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.*

**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 non-renewable 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.

...*"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**

ASSISTANT EDITOR

**HAIG KASABACH**

**Sterling Hill Mining Museum  
Foundation**

30 Plant Street • Ogdensburg, NJ 07439-1126

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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.

# The James Rumrill Collection Donated to the Sterling Hill Mining Museum

Bill Kroth

During the fall of 2021, James Rumrill of Towaco, New Jersey contacted us and asked if we would like to acquire his collection of local and worldwide minerals, as a donation to the Sterling Hill Mining Museum. Jim is a retired postal worker who worked in the Clifton, NJ area for most of his career. Now as a 90-year-old, he wanted to be sure that his remarkable collection, that took a lifetime to build, would have a safe, secure, and useful future. We were not sure of the size of the collection, but we responded that we would come to his home in a few days with a pickup truck to bring his collection to our museum.

Upon meeting Jim and entering his home, we were amazed at the size and quality of the collection, the degree of organization, the beautiful hand-made wood and glass cases, and the comprehensive computer database. I initially presumed that we would make one or two trips to his home with one vehicle; but it turned out to six trips with up to four vehicles for each excursion! We could have jammed much more into our vehicles and made fewer trips, but I wanted to be sure that nothing was damaged and all of the beautiful cases survived. Jim put much effort into doing things properly, and I wanted to take the extra care that the minerals and cases deserved.

Helping us were my wife, Denise; Sterling Hill Advisory Board members, Ken Daubert and Andy Marancik; Gift Shop staff, Carol Dunn and Sue Conklin; and tour guides, Brianna Wagner and Adam Baldwin. On our first visit we got a glimpse of the huge effort that would be required, but Jim's calm and friendly demeanor made us feel at home and in no rush. He showed us his many other hobbies such as tropical fish and an amazing greenhouse. We realized that he was a true collector at heart, like so many of us!

His best specimens were in his dining room. He turned common cardboard flats into beautiful uniform display cases for perfect organization and protection (see photo on right).



Each case has a glass- and oak-trimmed edge-molding, all carefully mitered to make them look totally professional. I thought to myself: "Why I didn't think of that!" Jim's wonderful fluorescent specimens from all over the world were displayed in two, tall, open shelving units. We walked around his home and into the basement and were shocked at the number of specimens that were neatly organized (in flats) on many metal shelving units. Fortunately, we were able to drive our vehicles right up to the doors leading into the basement, and it was about ten concrete steps that provided the only challenge to removing the collection.

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**THE JAMES RUMRILL COLLECTION DONATION**

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I am still amazed at the effort Jim put into organizing, labeling, and documenting his collection. There is simply no guesswork at all. Anything you want to know about the specimens is on Jim’s flash drive that he provided to us. The quality, variety, and depth of the collection are absolutely superb, both for local (New Jersey) and worldwide specimens. When Denise first opened the digital catalog on her computer at our home; I jokingly said: “See if he has a gerstmannite?” Now gerstmannite is the rarest and most desirable mineral from Sterling Hill; I wondered if there could possibly be one? Wow, a second later, there it was -- specimen number 3352.01, bought from Excalibur (Tony Nikischer) in 1991. The number after the decimal point gives a nice clue as to how many of that species are in the collection; in this case just one. If, for example, you like deep-red, fluorescent tugtupite from Greenland, take your pick, there are ten!

The collection now is safely stored in our “Lecture Room” in the Kolic GeoTech Building (see photo below).



We removed the many chairs from the room and installed new, heavy, metal racks that were purchased specifically for the collection. We had a donated, tempered glass, storefront door already in stock that we installed as the main entrance to the room. New locks were installed on all doors leading to the “Rumrill Room.” It is now a dedicated, secured, and climate-controlled environment. Our plan is to slowly and carefully arrange all of the more than 1000 flats in an order and sequence that will provide the opportunity to easily and quickly locate any specimen. We plan to add some of the Rumrill specimens to existing displays in Zobel Hall; the remainder will be kept as an amazing and comprehensive reference collection.

On behalf of the Sterling Hill Mining Museum Board and Advisory Council, and all of our many and varied visitors, we would like to thank Jim Rumrill for trusting us with a major part of his life’s work and investment. His efforts have certainly given us a new and major resource. Thank you, Jim! 🐙



# The Railroads That Served the Sterling Mine: A Look Back in Time

Jeff Wilson

Over its long history, the Sterling Mine was served by three railroads -- the New York Susquehanna and Western (NYSW), the Lehigh and Hudson River (LHR), and Conrail. These railroads moved huge amounts of ore from the mine, and made the Sterling Mine a powerhouse.

In the early years of mining at Sterling Hill, ore was moved by horse-drawn wagon. This was an extremely time-consuming and arduous process. Moving ore over dirt roads, some not more than narrow paths through the woods, was very weather-dependent as well. Imagine hauling a heavy ore cart through the mud during a drenching rain, or through deep snow. A better way of moving ore had to be found.

The answer was with the NYSW Railroad, which had a line called The Hanford Branch, running from Beaver Lake Junction at the top of Hamburg Mountain, down the hill, over the Backwards Tunnel, and then along Cork Hill Road, to Zinc Junction in Franklin, where it intersected with the LHR Railway, then on to Sparta. The proximity of that rail line to the Sterling Mine made a rail connection a good solution to the problem of moving large amounts of ore to processing facilities. By 1900, the railway was connected to the mine by simply building a trestle and filling out some railbed. Then the ore immediately began to flow from the mine by rail. And it was just in time, because the massive ore processing plant in Palmerton, PA was up and running in 1899, and was in need of large amounts of zinc ore. Thanks to the rail connections, the Sterling Mine was able to answer that call.

The NYSW Railroad had its roots right here in New Jersey. It began, like many railroads in the area, as a method of moving farm and dairy products to market. Sussex County was a "gold mine" for those commodities. Adding ore shipments to the mix was very profitable for the railroad. As the farming and dairy product shipments dwindled in later years, it was the shipments of ore that kept the railroad chugging along. But as more time went by, the NYSW ran into financial trouble, and



Rare late 1930s era aerial view of Sterling Hill. Note the Great Sterling Mill complex, the new office building, the water tower on the hill, and the ten small ore bins near the south garage area where the ore cars were loaded. Also note the line of empty gondola cars being backed in over the trestle, to be loaded.



1960s era aerial photo of Sterling Hill. Wow, what a difference! Note that the entire Great Sterling Mill complex has been removed; and the new upper complex buildings, conveyor, and ore bins have been constructed. The lower headframe remains as well as the water tower. The railroad tracks over the backwards tunnel have been abandoned and removed.



**THE RAILROADS THAT SERVED THE STERLING MINE: A LOOK BACK IN TIME**

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had to shed some assets. In 1957, the decision was made to abandon the NYSW Hanford Branch, leaving the Sterling Mine without rail service. That is when the LHR Railroad stepped in.

Contracts were signed in mid-1959, and the LHR took ownership of the two-mile-long branch line from Zinc Junction (right below the mighty Franklin viaduct), to Sterling Hill. Service commenced immediately. The remainder of the old NYSW Hanford Branch, from the mine to Beaver Lake Junction was abandoned, and the rails were torn up. But the branch line from the Sterling Mine to Zinc Junction was bustling with rail traffic. Two trains a day, one in and one out of the mine, rumbled along Cork Hill Road, hustling ore cars to the main line in Franklin to be added to LHR freight trains, for the trip to Palmerton.



**1950s era photo of the Palmerton Processing Plant. Trains came in from the left (west), were backed onto the elevated tracks in front of the plant, where they were unloaded, and the ore was brought by bucket loader into the plant.**

The LHR had its roots in Warwick, NY. It began as the Warwick Valley Railroad, which shipped farm goods of all kinds from the Black Dirt Region of Orange County to markets in New York City. The first LHR line ran from Warwick to Maybrook, NY, where the freight was transferred to the Erie Railroad for shipment to New York City. Around the turn of the century, the railroad expanded south to Belvidere, NJ, and then on to Allentown, PA via trackage rights on the Pennsylvania Railroad, and the Central Railroad of New Jersey. It was renamed the Lehigh and Hudson River Railroad because of its connections in the Lehigh Valley in Pennsylvania, and the

Hudson River Valley of New York. The LHR had served mines along their trackage in Limecrest, Franklin, Vernon, and McAfee (all in NJ), and Pine Island, NY for decades; hence, adding the Sterling Mine to the mix made perfect sense. Unfortunately, the LHR encountered financial troubles over the years. The railroad declared bankruptcy for the first time on April 19, 1972, but was able to continue operations. The LHR served the Sterling Mine faithfully for 29 years, until a second bankruptcy filing forced a merger with Conrail, which was operated by the United States government.



**1955 photo of an early LHR diesel locomotive (#12, an ALCO RS-3 built in Schenectady, NY). Notice the Jersey Central Lines caboose #91541. This is a sister caboose to our own Central Jersey Lines #91544! The photo was taken at Zinc Junction in Franklin.**

The name Conrail stands for Consolidated Railroads. In April, 1976, more than 20 financially-troubled, failing railroads were saved from imminent demise by the formation of Conrail; LHR was one of those railroads. Conrail eventually became very profitable and efficient. However, Conrail only served the mine for four years when management decided that shipping ore from the Sterling Mine was no longer profitable, and ore shipments ceased abruptly in 1980. The rail beds were immediately torn up, and the branch line was abandoned permanently, thus ending rail service to the Sterling Mine. After rail service ended, ore was shipped by truck to the Palmerton plant.

In the early years of railroading, big steam-powered locomotives switched ore cars around the mine tracks, belching black smoke, cinders, and steam. As time went on and technology improved, steam locomotives were replaced by diesel-powered locomotives. The LHR used American Locomotive Company (Alco) diesel locomotives built in Schenectady, NY. These engines required much less maintenance than steam engines, and were very reliable.

Ore cars also changed over the years. They began as open-topped gondola cars. These were ugly, clunky cars that looked like rolling trash dumpsters. But again, as technology improved, so did the ore cars. Beginning around 1960, covered hopper cars were used. They were

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## THE RAILROADS THAT SERVED THE STERLING MINE: A LOOK BACK IN TIME

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**CAPTION:** The last locomotives that LHR purchased were ALCO Century C420's, built in Schenectady, NY. Locomotive #29 was the last of the nine purchased in the early 1960s. In this photo, #29 idles under the mighty Franklin Viaduct, after picking up a string of ore cars from Sterling Hill, waiting to head out onto the main, and make the run to Allentown, PA.

air-tight, water-proof rolling containers that held a great deal more than the gondolas, and more importantly, kept the ore dry. Each covered hopper car was 42 feet long, and could hold up to 233,000 pounds of ore. An average train departing from the Sterling Mine would haul 25 to 30 filled and covered hopper cars.



In this photo, LHR locomotive #24 pulls cars around the ore bins. The nose of the locomotive would be partially buried in the worldwide mineral collecting pile today.

Yard operations at the mine were compact and highly efficient. The main track entered the property from the trestle over Passaic Avenue, then gradually curved toward the ore bins. A bypass track ran along the ore bins, where the Christiansen Pavilion now stands. (Interesting note: during construction of the patio area, a portion of the retaining wall for the bypass track was uncovered!) The track ran through the area of the current Mine Run Dump, to just past the south garage on the mine property. Along the way, it joined the two tracks that led under the ore bins, and continued back into a small staging yard, where the Ellis Observatory now stands. Trains would arrive with around 30 empty cars. They would break the train into smaller groups of cars, and then back each group of cars under the ore bins to be filled with ore, one at a time. After they all were filled, the train would be assembled, then traveled to Zinc Junction in Franklin, to be added to outbound trains heading to Allentown, PA. There, the train cars would be transferred to the Lehigh Valley Railroad, for the final leg of the trip, north, along the Lehigh River, to the NJ Zinc processing plant in Palmerton.

Today, the railroads that served the mine are but a distant memory. The backwards tunnel, the old rail bed along Cork Hill Road, the old trestle, and the ore bins remain, but little else is present to remind us of how important the railroads were to the mine. Our railroad and caboose displays will serve forever as reminders of the glory days of railroading at the mine. As seen in the archival photographs, big heavy locomotives pulled trainloads of valuable zinc ore from the mine, rumbled down the tracks, bringing prosperity to the mine, the town of Ogdensburg, and the hard-working miners of the day. 🐞

Historical Information and photos provided by:

Trains.com

Marty Feldner, Historian, The Lehigh and Hudson River Railroad

Tim Darnell

RailroadPictureArchives.net

The Sterling Hill Mining Museum Archives

*Jeff Wilson, a life-long rock and mineral collector, has been a member of the Sterling Hill Mining Museum since 2009; and is a member of the Franklin-Ogdensburg Mineralogical Society, the Orange County Mineralogical Society, the St. Lawrence County Rock and Mineral Club, and the North Jersey Mineralogical Society (where he has served as President and Show Chairman). Jeff works as an area manager at The Home Depot in Matamoras, PA.*



# Mine Lighting

Earl R. Verbeek

[Ed. Note: This document was prepared by Dr. Verbeek more than a decade ago as a resource for professional development training for science teachers, based on a chemistry theme. It is being reprinted in this edition of the Sterling Hill Newsletter.]

**M**ining in one form or another has been going on for more than 40,000 years. Some of the earliest known mines were for hematite ( $\text{Fe}_2\text{O}_3$ , which when ground produces a red pigment) and flint (for tools and weapons). The earliest mines were surface operations, where daylight sufficed as a light source. Later, as deposits were followed deeper into the earth, some means of providing light underground had to be devised. Mirrors were tried in some places but had obvious limitations: the need for continual repositioning as the sun traversed the sky, the inability to reach certain areas without multiple mirrors, etc. The only practical means of providing light underground was for a miner to carry a portable light source with him – and all of those sources, with the exception of a few spark generators, depended on chemical reactions to produce the light. Described below are four sources of light that proved important to underground mining through the ages: oil lamps, candles, carbide lamps, and electric cap lamps.

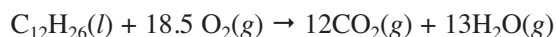
## Oil Lamps

Oil lamps in one form or another have been in use for more than 12,000 years. A variety of fuels were used through the ages, depending in large part on availability: olive oil, whale oil, fish oil, beeswax, nut oil, animal fats, seed oils, and clarified butter.



The oil in mining oil lamps is generally kerosene, which supplanted the earlier whale oil lamps when petroleum came into more general production in the mid to late 1800s. The “lamp oil” sold in stores today is kerosene, often with a dye added for color, and an odorant added for a more pleasant smell. Kerosene is a thin, oily, almost colorless liquid obtained by the fractional distillation of petroleum.

Kerosene is not a pure compound but a mixture of hydrocarbon liquids ranging in composition from  $\text{C}_{12}\text{H}_{26}$  to  $\text{C}_{15}\text{H}_{32}$ . Its combustion reactions will thus depend upon the components of the mixture, their proportions, and the conditions under which combustion takes place. However, as a hydrocarbon, the reaction will produce mainly  $\text{CO}_2$  gas and  $\text{H}_2\text{O}$  vapor. The combustion of dodecane,  $\text{C}_{12}\text{H}_{26}$ , is representative:



Incomplete combustion, resulting either from insufficient vaporization of the kerosene and/or insufficient air to give complete combustion, often results in the production of some carbon monoxide (CO) and carbon (as soot). The sooty flame of a railroad lantern when the wick is turned too high is (or was) a familiar example.

## Candles

Candles have been in use as a lighting source for more than 5,000 years. All burned a solid waxy substance, but the source and composition of that substance varied with time and place. In addition to the paraffin and beeswax candles familiar to us today, a variety of other waxy substances were used at various times and places: tallow (rendered animal fat); waxes from various plants, nuts, fruits, and insects; spermaceti (solidified whale oil), and stearin.

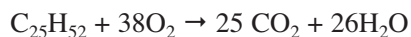


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## MINE LIGHTING

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Paraffin (or more correctly, paraffin wax when referring to candles) is a mixture of solid hydrocarbons ranging in composition from  $C_{20}H_{42}$  to  $C_{40}H_{82}$ . Complete combustion of such compounds results in carbon dioxide and water vapor as reaction products. To take one example:



Note that this equation merely lists the beginning and end products for complete combustion and does not reveal the complex chemistry of what happens when a candle is lit. In a candle flame, different reactions (both endothermic and exothermic) occur in different parts of the flame, and sufficient oxygen for complete combustion is not everywhere available. The reaction chemistry is accordingly complex and is here described only in general terms.

In the part of the candle closest to the wick, near the base of the flame, the flame shows only a faint blue glow. In this area, paraffin liquid in the wick is being vaporized by heat, and the paraffin is breaking down into hydrogen and long, unsaturated carbon chains. The vaporization of the paraffin is an endothermic reaction – it consumes heat rather than produces it. The initial heat to start this reaction is supplied by the match used to light the candle, and the heat to sustain it by the luminous, hot part of the candle flame that surrounds the blue interior. The blue glow results from a short-lived molecule formed in this part of the flame: diatomic carbon,  $C_2$ . This molecule, plus the carbon chains, exist in this part of the flame because there is little oxygen available here; it has all been used up in the outer parts of the flame, described next. Incidentally, the cooling effect due to the vaporization of paraffin, plus the lack of oxygen, are the reasons the wick does not burn up during use.

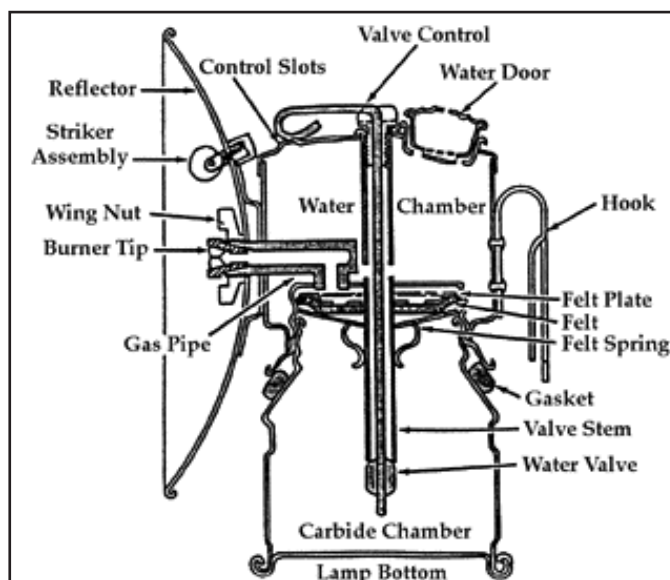
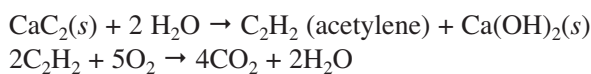
The bulk of the candle flame, outward and upward from the wick area, provides the yellow glow for which candle-light is so well known. It is here that the carbon chains formed in the blue area react with oxygen to form carbon dioxide, and the hydrogen reacts with oxygen to form water vapor. These are exothermic reactions and produce much heat, which causes the burning carbon chains to glow by incandescence, similar to the glow of wood embers in a fireplace.

If the wick is short and oxygen is in abundant supply, all of the carbon in the flame is oxidized to carbon dioxide, and the candle burns with a clean flame. If, however, the wick is too long (thereby delivering too much vaporized paraffin into the flame) or air flow to the flame is impeded in some

way, incomplete combustion will result in a “sooty” flame as unburned carbon particles are liberated into the air. The result will be a dark zone at the top of the flame where wisps of black smoke rise into the air.

### Carbide Lamps

Carbide as a fuel was discovered in 1892. Invention of the first practical carbide lamps soon followed; a model intended for mining was invented in 1897. The light from carbide lamps is provided by burning acetylene, a gas created when water reacts with calcium carbide ( $CaC_2$ ). In a typical carbide lamp a lower chamber holds the carbide, and water is slowly dripped into this chamber from a holding tank above by means of an externally controlled valve. The pertinent reactions are:



Note that with complete combustion the only reactants from the burning of acetylene are carbon dioxide and water. In actual use, however, incomplete combustion often results in a sooty flame, which miners used to write their initials, draw cartoons, or scrawl humorous or insulting messages on the mine walls.

### Electric Cap Lamps

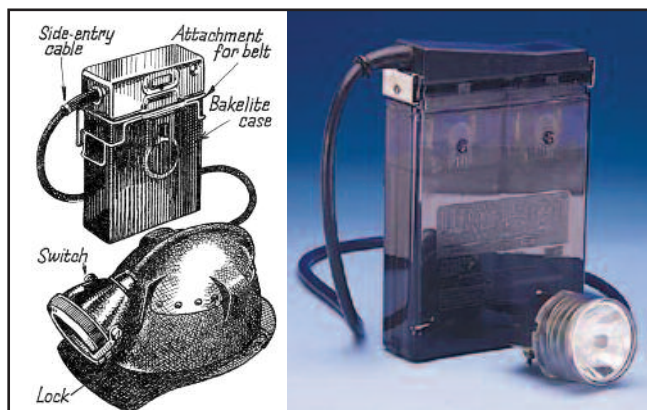
The first portable, rechargeable lead-acid lamp was patented in 1885, but electric lamps were slow to catch on in many mining areas because of the heavy weight and poor light output of the early models. These factors put electric cap lamps at a disadvantage compared to the carbide lamps then in widespread use, which combined light weight with a bright flame. Design improvements gradually led to greater acceptance of electric cap lamps by miners, and by

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**MINE LIGHTING**

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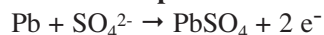


the 1930s they were in common use. Today it is rare to find a miner working with a carbide lamp, save for some diehards who prefer the hiss and distinctive odor of a carbide lamp to the silent glow of an electric one. Though electric lamps are still much heavier than carbide ones, the heavy part of the unit, the battery pack, is worn on one's belt, where the weight is scarcely noticed.

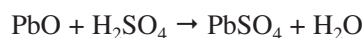
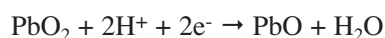
Rechargeable lead-acid batteries, similar to those used in automobiles, are the power source for electric cap lamps. The basic unit consists of three plates held apart by porous separators, the whole immersed in an electrolyte solution contained within a strong, shock-resistant, plastic case. The electrolyte is a dilute solution of sulfuric acid. The central plate is made of lead dioxide,  $\text{PbO}_2$ , and the two outer plates of metallic lead. During discharge, when the lamp is turned on to produce light, all three plates are gradually converted to lead sulfate,  $\text{PbSO}_4$ , generating an electric current in the process.

Discharge cycle:

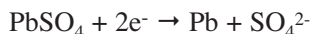
For the **lead plates** the reaction is:



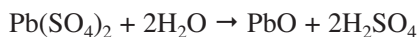
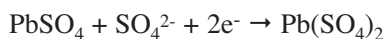
For the lead oxide plate, the reactions are:

Recharge cycle:

For the **lead plates**, which after discharge have been converted mostly to lead sulfate, the recharge reaction is:



For the **lead oxide plate**, the reactions are:



Note that lead sulfate,  $\text{PbSO}_4$ , is a reaction product for both the lead and lead oxide plates during the discharge cycle and is converted back to lead and lead oxide during the recharge cycle. This works fine if the battery is properly used and maintained, so only small lead sulfate crystals are formed, sufficiently small that they are easily dissolved again during the recharge cycle. However, if larger crystals form and build up on the battery plates—a process called sulfation—the result is a shortening of the usable life of the battery. The usual causes of sulfation are undercharging the battery, storing it for long periods of time without use, or failing to top off the electrolyte to keep the battery plates fully immersed. Signs of a sulfated battery include decreased light output, shortening of the time before recharge is needed (i.e., a cap lamp dimming-out before a miner's shift is done), and inability of the battery to hold a charge. Fortunately for miners, the light output of a sulfated battery does not suddenly “crash” to zero but will continue to emit a dim light for enough time to allow safe navigation to the shaft station. 🐜

*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.*



# Sterling Hill Classics

## Köttigite

Richard C. Bostwick

[Ed. Note: Each edition of the Sterling Hill Mining Museum newsletter will include this Sterling Hill Classics feature, focused on specimens from the Sterling Hill Mining Museum collection. Local mineral expert and former Sterling Hill miner, Richard Bostwick, will select and write about specimens worthy of this special focus. These specimens will be available for viewing at the museum, and all will have come from the Sterling Mine. Some will be the proverbial “eye candy,” but others may be rare, unique, or have an interesting provenance. Köttigite is the focus of this Sterling Hill Classic article.]



**Köttigite from the Sterling Mine. 4x5 inches. Photo by Tema Hecht.**

**K**öttigite is a hydrated ferrous arsenate,  $Zn_3(AsO_4)_2 \cdot 8H_2O$ , named in 1850 by the American mineralogist James Dwight Dana to honor the German chemist Otto Friedrich Köttig, who first analyzed the mineral. Its type locality is the Daniel Mine, Schneeberg, Saxony, Germany. According to *mindat.org*, pure köttigite “should be colorless, but frequently is carmine-red, red-orange, brown, pale gray-blue, gray-green,” and “light-rose-pink in transmitted light.”

The locality that has yielded the best-known and most prolific finds of köttigite is Mina Ojuela, Mapimi, Durango, Mexico, where köttigite occurs as gray-blue crystals and radiating crystal clusters, usually on a matrix of limonite. While most Mina Ojuela köttigite crystals are smaller than one cm, a few are larger, and attractive specimens are available from mineral dealers on and off the Internet. To appreciate the variety of köttigite specimens from Mina Ojuela, visit the photo gallery on *mindat.org*, while noting that only a few small Sterling Mine specimens are pictured.

The Sterling Hill köttigite specimen featured here is grayish-blue, a color similar to that of most köttigite from Mina Ojuela, and forms an unusually rich, two mm-thick “fan” of köttigite crystals on a matrix typical for the species at Sterling Hill: calcite-rich ore with minor bustamite and grains of franklinite, willemite, and sphalerite. The quality and coverage of Sterling Hill’s köttigite crystals varies, but some specimens are noted for 360-degree crystal rosettes that can be more than six cm in diameter. It can be argued that the best Sterling Hill köttigite specimens are superior in color, crystal form, and size when compared to specimens from Mina Ojuela; but as with many limited finds of rare minerals from Sterling Hill and Franklin, most Sterling Mine köttigites are acquired by local collectors and rarely displayed, publicized, and/or sold at major mineral shows, such as those at Tucson and Munich. In any case, there will never be enough world-class Franklin and Sterling Hill rarities to satisfy the demands of the mineral marketplace. (Your author has noticed that, for example, a new find of wulfenite crystals from a small but legendary Arizona mine, e.g. the Red Cloud Mine, can yield a hundred or more specimens, similar in quality, that will

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## STERLING HILL CLASSICS

Continued from page 12

sell out quickly during the Tucson show. However, the chances of encountering flats of excellent Sterling Hill köttigite specimens in quantity was remote when they were found, and impossible today.)

Köttigite was one of many arsenates found in the Sterling Mine in July, 1972, in a vein system about 20 feet below 340 level; arsenopyrite had been found there earlier, and was thought to be the source of the arsenic. The original report of this find in *The Picking Table*, February 1973, Vol. 14, No. 3, p. 8, is worth reading. The author (probably Frank Edwards, *PT* editor) described the find:

“The matrix is franklinite in calcite with some willemite and bustamite. Two faces are coated with an earthy coating, ranging in color from a light tan to a dark brown. This has tentatively been described as pit-ticite (another new mineral for the area). On this coating are radiating fibrous crystal aggregates, up to 2 [inches?] long, of a light bluish gray symplectite with a dull luster. The mineral has been verified by Paul Desautels, who also pointed out that they are the finest specimens of the species, which normally occurs in minute rosettes.

“Pharmacosiderite... On the same specimen on which the symplectite was discovered, John White of the Smithsonian has now verified an occurrence of pharmacosiderite. These were also found on the crust as micro yellow green cubic crystals. Pharmacosiderite normally is found as an alteration product of arseniosiderite – the probable cause of this occurrence.

“Still on the same piece are very small yellow balls of what has been tentatively identified as pharmacolite by chemical and optical means. And, reddish brown grains and small masses similarly identified as arseniosiderite. Confirmation of these findings by x ray analyses is being sought...

“Another new mineral for Sterling Hill, köttigite, has been verified by John White at the Smithsonian. This piece also came from the arsenate area, 340 ft. level, 960 stope... The specimen is about 4x2x2”; the surface is covered by a lustrous colorless mineral in small to large crystalline areas, overlaying a faintly blue crust, which is probably symplectite. This colorless mineral has been identified as köttigite, a member of the vivianite family.

“This occurrence may prove to be the definitive one for the species. Dana’s 7th reports that the only previous

occurrence was a secondary mineral derived from the alteration of smaltite and sphalerite at the Daniel Mine, Schneeberg, Saxony, Germany, where it occurred as light carmine and peach blossom red massive or in crusts with a crystalline surface and fibrous structure.”

From *The Picking Table*, Vol. 14, No.2, August 1973, p. 6:

“*Legrandite*, a hydrated basic zinc arsenate, was identified on a Sterling Hill specimen by Dr. Warren Miller and David Cook. The specimen from the arsenate area is in the collection of Ewald Gerstmann. The original find is on the crusted surface of a diamond shaped piece, about 3” to a side by 2” high. The matrix is ore of black willemite, franklinite, calcite with some sphalerite. The legrandite occurs in about 12 crystallized areas, averaging ½” in diameter, of yellow crystals or needles. Other arsenates also occur in the crust”.

To summarize, this limited 1972 occurrence at the Sterling Mine, in 960 stope below 340 level, was described in Pete Dunn’s 1995 monograph, *Franklin and Sterling Hill, New Jersey: the world’s most magnificent mineral deposits*. That occurrence was then known to include these arsenate minerals: adamite, arseniosiderite, barium-pharmacosiderite, köttigite, legrandite, metaldevite, ogdensburgite, ojuelaite, parasymplectite, pharmacosiderite, scorodite, walkkilldellite, and yukonite.

In *Dana’s New Mineralogy, Eighth Edition* (1997), the only localities mentioned for köttigite are the Daniel Mine, the Sterling Mine, and the Ojuela Mine. Köttigite is now listed in *mindat.org* as having been found in seventy localities, in twenty countries.

Sterling Hill has produced the world’s largest crystals of köttigite, including specimens such as the one shown above, from John Kolic’s collection, and specimens with rosettes of pale blue crystals more than five cm in diameter. These are certainly the largest known crystals of köttigite, and if size is considered, the world’s best. 🐞

*Richard Bostwick joined the Franklin-Ogdensburg Mineralogical Society in 1960, when he began collecting the fluorescent minerals of Franklin and Sterling Hill. Since 1980 he has maintained the check-list of those minerals, as well as speaking and writing about them. He worked as a miner at the Sterling Mine from 1975 to 1978. He and his wife, Tema Hecht, were co-managing editors of The Picking Table from 1995 to 1999, and are still on its editorial board. A Fluorescent Mineral Society member since 1974, Richard was inducted into the FMS’s Hall of Fame in 2020. The rare Franklin mineral bostwickite was named for him in 1983 by Pete Dunn and Peter Leavens.*

# Return to Sterling Hill Mine After 50 Years

Bruce Bannon

Several months ago, I met with Bill and Denise Kroth, at the Sterling Hill Mining Museum. Bill invited me to assist his team by supporting efforts to renovate and repair equipment, as well as to be a tour guide. Frankly, I was excited to get an opportunity to return to the Sterling Mine and to see the changes there after being away for 50 years. But before I discuss my return, here is some of my history in mines and rocks.

Mining, metals, and minerals were important parts of my childhood. My father worked in the zinc mines in both Ogdensburg and Franklin as a very young man. After a few years, he moved to the copper mines in Bisbee, Arizona where he worked until World War II. As expected, mining was tough work for a 16-year-old!

My first home was a company-owned house in Hibernia, New Jersey. We lived with my grandfather and grandmother. We all used a single outhouse, which was somewhat scary late at night. Hibernia contained numerous shaft mines which were rich in high grade iron ore. My Slovakian grandfather and uncles worked in these mines and often brought home interesting rock samples for my mother and me.

The person most responsible for sparking my initial interest in rocks and geology was my mother, Emma, who loved to hike, explore, and collect various items from nature, especially rocks. On my first official rock collecting trip, my mother took me to the Buckwheat Dump in Franklin, NJ. At seven years old, I could not believe the wide range of beautiful and unusual rock specimens that were available. The fluorescent properties of the minerals were especially interesting. My favorite rock that I collected that day was a ten-pound mass of orange calcite. I still have that rock; it is proudly displayed in my living room. My favorite rocks are those that remind me of fun times, special people, and learning new things.

Following are some of the key events in my life that enabled me to achieve my geologic and metallurgical dreams:

- I was accepted at Penn State with a full academic and football scholarship. Penn State not only had a great football team; it was also ranked as one of the most outstanding geologic/metallurgical colleges in the country. I enjoyed my education at Penn State, especially the "hands-on" approach to learning in the field.
- I spent a summer working at the Sterling Mine. The union at the mine was looking for two college candidates who wanted a hands-on education about mining and geology. My mother sent in two applications; one for me and one for my best friend, John. We both got hired. Working at the Sterling Mine was a great experience in which we not only started to learn about the skills and techniques of mining, but also the geology and mineralogy of a famous zinc ore body. I must admit that John and I made lots of mistakes, and at times we were quite frightened. On the other hand, it was tough to beat the beauty of a stope when the mining engineer shined his UV light on a ceiling covered with beautiful fluorescent minerals. For current tours at the Sterling Mine, turning off all of the lights and shining the UV light at the fluorescent walls is still the number one attraction. When it was announced that the Sterling Mine was closing, I felt quite sad, especially because the mine still contained a million tons of rich ore. Little did I know that one day I would be returning to the Sterling Mine.
- My business career focused more on metallurgy than geology. I ended up working on the processing, fabrication, and applications of high-performance alloys, such as titanium. These high-performance alloys were used in critical applications in several markets, such as aerospace, military, medical, power generation, and pollution control.

So now I am retired and looking for fun and interesting things to do. Eight months ago, I visited the Sterling Hill Mining Museum with my daughter Amy, her husband, and my grandson. We were fortunate enough to meet Bill Kroth who told us about his plans for the mine, museums, support buildings, and equipment. We discussed the huge slab of fluorescent rock taken from the wall of the open pit at the mine. This fluorescent slab now welcomes visitors to the American Museum of Natural History in

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**RETURN TO STERLING HILL MINE**

Continued from page 14

New York City. Several fluorescent slabs are also on display in two stopes of the Sterling Mine where visitors on tour can see them.

Bill and I discussed the need for additional resources to support all the planned improvements. Several hard-working men and woman already were servicing equipment and systems that suffered from 18 months of closure due to the COVID-19 pandemic. Tour guides would be needed for visitors, especially when students return to the physical classrooms. Before the virus, an average of ten school buses, loaded with students, would visit the mine on a typical day. Even though I lived in Arizona, I volunteered to support the efforts of Bill and his team for the month of August 2021.

I enjoyed returning to the Sterling Mine, helping the workers get the mine back in shape and guiding tours to educate visitors of all ages. Even though most of the 35 miles of shafts are flooded, much of the upper-level adit is in great shape; very safe with numerous points of interest. The Warren Museum of Fluorescent Minerals is incredible. The large mining museum, Zobel Hall, which formerly was used for showers and lockers, is full of beautiful

mineral specimens from around the world, and tons of mining equipment and artifacts.

Most of my mornings at the mine were spent supporting Andy Marancik and Ken Daubert, both hard-working and knowledgeable staff members, in staining/painting and repairing/upgrading mining equipment and various mine devices and systems. I especially enjoyed being a tour guide in the afternoons. I could give visitors a different perspective of the mine because I worked there and spent some time doing or supporting almost every job in the mine. In addition, being a geologist enabled me to give an interesting perspective and background on topics like dinosaurs living down the street and volcanoes in Sussex County. Having visitors ask questions was an opportunity to educate the crowd while having fun. On one tour we had a coal miner from Slovakia. We spent half of the tour discussing differences in coal versus hard rock/zinc mining. The rest of the tour group enjoyed our give-and-take.

After a month of working, learning, and having fun at the Sterling Hill Mining Museum, I had to return to my home in Arizona. I felt sad leaving my friends and my jobs, especially my work as a tour guide. Hopefully, Bill will let me return to the Sterling Hill Mining Museum next year! 🐼

**To our members and newsletter readers: We request your input regarding topics for future articles in the Sterling Hill Mining Museum newsletter. What topics would you like to read about?**

- **Mining history?**
- **Mineral collecting?**
- **Local history?**
- **First-hand accounts regarding the Sterling Mine?**
- **STEM (Science, Technology, Engineering, and Mathematics) education topics?**
- **People associated with the Sterling Mine and Ogdensburg?**
- **Miners' experiences in the Sterling Mine?**
- **What other topics would be of interest to you?**

**Please send your ideas for topics to the Sterling Hill Mining Museum newsletter editor, Jeff Osowski, at [jvotmo@comcast.net](mailto:jvotmo@comcast.net). And we are always looking for new authors for the newsletter. If you would like to write an article, please email the editor at the address above. Thank you.**

# Then and Now The Sterling Mine Under Construction, “Up Top”

Gordon Powers

To show how Sterling Hill has changed over the years, the newsletter occasionally will include an article comparing an historic photo of the mine with one taken at the present time. To the degree possible, we will try to replicate the position and view of the older photo.

The first picture was taken in the late 1950s and shows the grinding and drying facility at the top of the hill, when it was under construction. The camera in this historic photo was facing northeast toward the Backwards Tunnel, which is visible in the upper left portion of the photo. The railroad bridge over Passaic Street can be seen to the left of the Backwards Tunnel and Passaic Street can be seen across the top of the photo.



The second picture was taken on March 3, 2022 using the museum’s drone. This photo was taken from a higher altitude and a slightly different angle than the original photo. There are many more trees on the upper mill site making it difficult to see many of the landmarks visible in the earlier photo.

The drone gives us some flexibility to capture pictures like this, and we hope to have more for your viewing pleasure in the future. 📷

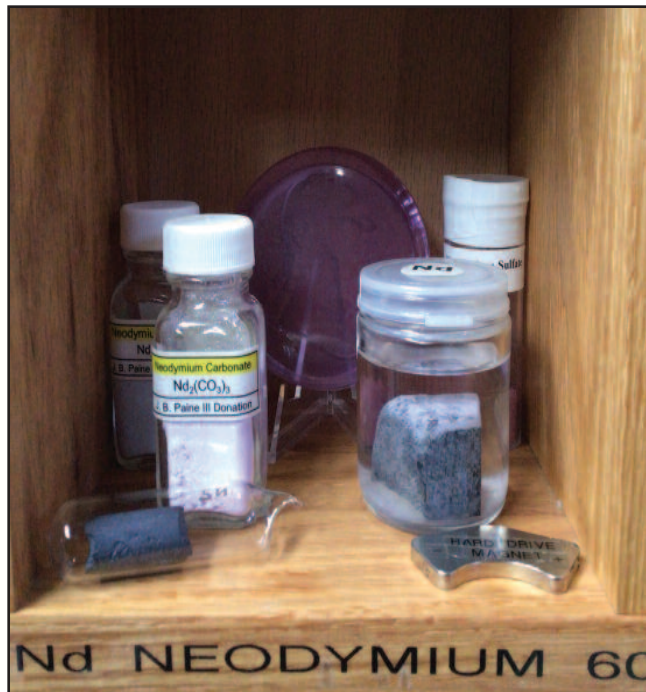
*Gordon Powers, a trustee at the Sterling Hill Mining Museum, worked for the US Army as a civilian mechanical engineer for almost 39 years before retiring in 2017.*





# Element Neodymium

Gordon Powers



**T**his fourteenth article in the continuing series on our periodic table display in the Zobel Hall will focus on the rare earth metal, neodymium, which is in the lanthanide group of elements. 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.

Pure elemental neodymium is silvery white. Its melting point is 1861° F. Neodymium has an atomic number of 60 and is rarely found in its pure elemental form in nature; it is much more likely to be found in ores along with the other rare earth elements. Neodymium is considered to have low to medium toxicity. Its chemical symbol is Nd and, depending on which reference source is used, it is the 27th most abundant element in the Earth's crust. The rare earth metals are not actually rare in the Earth's crust; they are just not in concentrated deposits, but rather, are scattered throughout the crust. Neodymium is the second most abundant lanthanide element and is more common than tin or lead. The principal economic sources of rare earths are the ores bastnasite, monazite, and loparite.

The first efforts to separate what is now known as rare earth elements (or REEs) began with minerals from Sweden in 1751. Over the course of the next 100 years the different elements were slowly separated. In 1839 Carl Gustaf Mosander, working with cerium nitrate, was able to isolate two oxides he named lanthanum and didymium. In 1885 Carl Auer von Welsbach was able to separate didymium into praseodymium salt and neodymium salts (neo new and didmos twin). Pure neodymium metal was finally isolated in 1925. China, the United States, Burma, and Australia had the largest mining production of rare earths in 2021.

The first uses for neodymium were for coloring glass and in the production of mischmetal, an alloy used in sparking flints in lighters; neodymium is still used for those purposes today. Neodymium-dyed glass has the property of changing color depending on the lighting source making it prized by collectors. Also, the light transmitted through this glass shows sharp absorption bands and, as such, is useful for astronomers to calibrate spectrometers. This sharp absorption property also makes it useful as eye protection for welders and glass blowers. Multiple neodymium alloys are found in laser crystals, where they are used in many different applications including green lasers and high energy lasers. Radiometric dating makes use of samarium-neodymium ratios to date rocks and meteorites.

Most people are probably aware of neodymium magnets, an alloy of neodymium, iron, and boron. These strongest of permanent magnets are used in a variety of items including microphones, loudspeakers, headphones, and computer mechanical hard drives. They are used extensively in motors of all sizes, including those found in hybrid and electric automobiles. Some wind turbine generators also make use of neodymium magnets. Because neodymium is necessary for so many important devices, there is a growing concern about its supply availability.

There are many uses of this important element in today's world. Look a little closer at the items you use throughout your day to think how neodymium may have played a part in its production. And if you want to collect minerals containing neodymium at Sterling Hill or Franklin, there are two, retzian-(Nd) at Sterling Hill and monazite-(Ce) at Franklin. A good resource for a listing of local

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# Ask a Miner

Doug Francisco



Each edition of the Sterling Hill Mining Museum newsletter will include this Ask a Miner feature. We have gathered questions from curious students who have visited Sterling Hill. Doug Francisco, a miner at Sterling Hill from 1974 to 1986, will answer the questions.

**Do any of the machines in the mine still work? Did any of the mine machines break? Leah, 3rd grade, Franklin Twp., Warren Co., NJ Elementary School**

Hi Leah: Great questions. First, you asked if any of the machines still work. The Sterling Hill mine closed in 1986 and immediately the water began to flood the passageways. For about three years after the mine closed, we were able to go back down and bring to the surface some of the equipment. All that salvaged equipment still works, and I still use it in the mine! There is still a lot of equipment that was left behind and will never be seen or used again because it's all under water. Too bad!



Bill Kroth and the late Tom Hauck with the same "motor," rescued from the mine before it was flooded. It sat outside for 25 years. Bill and Tom have it disassembled; in the process of being restored to working condition.



This photo shows our small "motor" or engine in use on the 1850 level, while the mine was operating. This "motor" was used for hauling small loads of equipment back and forth underground. It was too small to haul our loaded ore cars, but worked just fine for moving smaller equipment.



This is that same "motor." It sat outside for more than 25 years. We use it today to move equipment in and out of the mine.



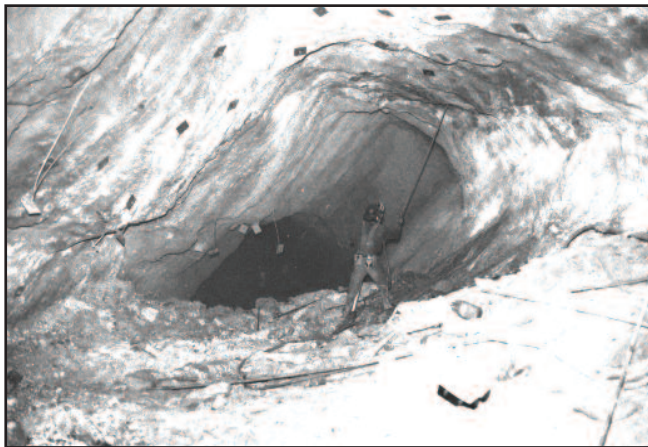
**ASK A MINER**

Continued from page 18

Next you asked if any of the machines we used ever broke. Yes! Mining was and still is very hard on equipment. A miner tried to take very good care of his equipment because if it broke, he couldn't get his work done. We had a very good mechanic's shop on the surface. When a drill or other piece of equipment broke, we would have to take it back to the surface to the shop. Usually, it came back good as new.

**Were you ever afraid of rocks falling on you or the mine caving in? Rafael, 5th grade, Ogdensburg Elementary School**

Hello Rafael: I knew that a rock falling on anyone, not just me, was very dangerous, so I treated my work area with great respect. If a small rock, maybe the size of a baseball, fell from only a foot above, it might hurt a little;



**In this photo, the miner is scaling or knocking down the loose rock after a blast, so it would not fall down and hurt someone. You also can see roof bolts in this photo, which were used to secure the ceiling which could be as much as 25 feet high, all to ensure that it was safe to work under.**

but some of our ceilings were 25 feet high. That same rock falling from 25 feet might send you to the hospital, or worse! We took great care in taking down loose rock

and securing it well so we could work safely. The Sterling Hill mine was a hard rock mine and was very stable so there was little danger of a huge cave in. Nevertheless, we



**This is what a cave in might look like if we did not scale down or remove the loose rock after a blast.**

treated each work area as if a cave in could happen; that way we were ready for anything. The first photo on the left shows a miner scaling to take down loose rock. The second photo shows what a cave in might look like; a small section of the ceiling has collapsed. We were very careful about loose rock in the mine; we all wanted to go home to our families at the end of the day in one piece! 🐛

*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.*

**Students**

We would like to feature your questions about mining and the Sterling Hill Mine in future Ask a Miner articles.

Please send your questions to:  
jvotmo@comcast.net

Include your first name, grade level, and school.

Thanks

**ELEMENT NEODYMIUM**

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minerals containing specific elements is the Franklin-Ogdensburg Mineralogical Society (FOMS) website at: [http://www.fomsnj.org/Franklin\\_Mineral\\_PeriodicTable.aspx](http://www.fomsnj.org/Franklin_Mineral_PeriodicTable.aspx).

If you enjoy these brief articles on the elements, you may also want to watch the many YouTube videos available on

this topic. The Periodic Videos channel is very good, and one of my favorite newer series is Elements of Webb, from the James Webb Space Telescope (JWST) channel, covering the elements used in the telescope. The Webb channel has a three-part series on beryllium, the primary element in the telescope. The element beryllium was discussed in the Sterling Hill spring 2017 newsletter. 🐛

# Then and Now The Sterling Mine East Limb of the Ore Body

Doug Francisco

The first photo below is from 1881, showing the excavated north end of the outcrop at the east limb of the ore body, where it pinched off at the surface.

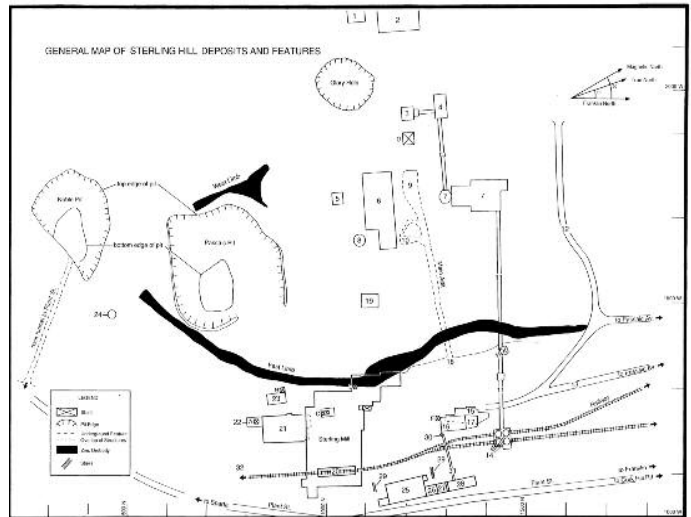


**CAPTION:** From Baker, G.W. 1881. Geological report on the mineral belt of Sussex County, N.J.; Sterling Hill, Mine Hill; Manganese Iron Ore Company., Philadelphia, PA. Also shown in Dunn, Pete J. (1997) The Story of Franklin and Sterling Hill. Privately published, (see p. 20).

In the second photo, taken in February 2022, I am standing in what appears to be the same location, directly behind the garage on the right side of the entrance road as you drive into Sterling Hill, across from the caboose. The two photos do not look exactly the same. In the current photo, I am standing above the level where the miner is standing in the 1881 photo; perhaps 15 to 30 feet above that level. After the outcropped ore was mined out in the east limb, the area was back-filled to the level you can see today. Also, new, wide cracks probably occurred over the intervening 140 years, due to freezing, thawing, and the weight of the hanging wall.



This third image below is a map of the surface level of the Sterling Mine ore body. The two photos above were taken at the far north (right) section of the east limb ore body, as shown in the map below. 🐛



From Dunn, P.J. (1995), Franklin and Sterling Hill, New Jersey: the world's most magnificent mineral deposits. Privately published, 755 pp. (see p. 106).

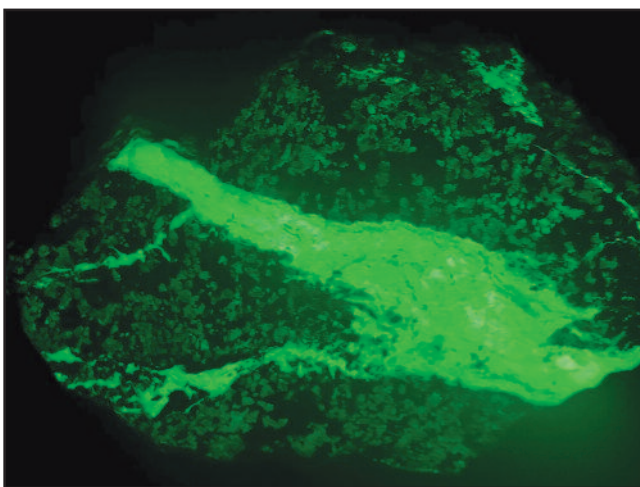
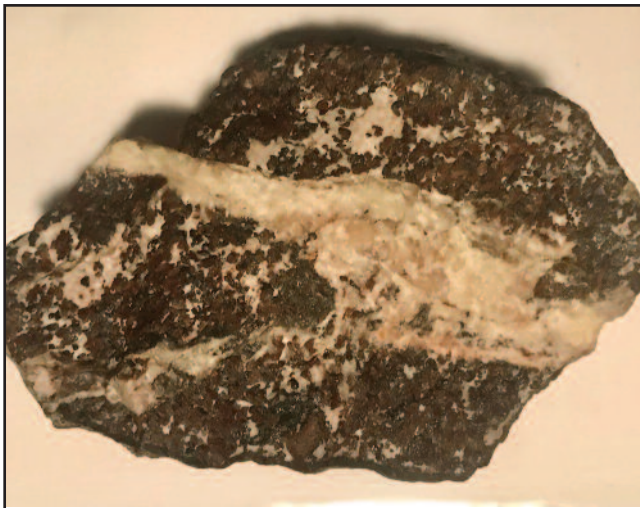


# My Favorite Vein Specimen

Ray Latawiec

I am often asked why I collect mineral veins from the great Franklin and Sterling deposits. My answer usually is that they are wonders of geology and mother nature. Thinking of all the processes involved in their formation and the hydrothermal events that took place secondary to the original deposit blows my mind. Besides being eye appealing and not requiring UV to bring out their beauty, vein mineral specimens are marvels of the mineral kingdom.

The vast majority of vein specimens in my collection are from Franklin; mainly because most of my field-collecting experiences and purchasing sources have been in Franklin. Sterling Hill specimens, although fewer in number, are none-the-less interesting and important. In



my experience, the Franklin specimen veins usually are bigger, wider, and occur in more varieties.

The specimen in these photos, from Sterling Hill, is an exception, and actually is the widest and most intensely fluorescent vein from both deposits in my collection (5 x 1¼ inches). The fluorescent yellow/green vein (shown in the second photo under shortwave UV light) cuts through brick red, mildly fluorescent willemite. This specimen is truly unique and a real geologic treasure.

Equally interesting is the story that goes with the acquisition of the specimen. Many years ago, in the mid-1980s, I was collecting rocks in the Franklin area, mainly visiting the legendary dealers on a weekly basis. Ewald Gerstmann was one of my first stops, and it was from him that I acquired the featured specimen. I had not yet started collecting vein specimens. I usually bought specimens I could afford, which was much easier back then before the "thousand-dollar rocks" in today's market. Usually, Ewald would offer me a batch of "bargain rocks" that I would almost always purchase. After arriving home, I found the specimen in the photos at the bottom of one of Ewald's buckets that I had purchased. This treasured piece required some tender loving care as it was covered in grime and garage paint specks. It turned out to be the best piece of the lot, and it led me to concentrate on collecting vein specimens. I was hooked. I did not own a UV light at the time, and I felt that the contrasting colorful veins were stunning in white light. I thank Ewald, along with the other deceased dealers, that made my life fuller and more pleasurable. I will hopefully share other prized specimens from Sterling Hill in future newsletters. 🐛

*Ray Latawiec is a long-time collector of Franklin and Sterling Hill minerals, a grandson of a Polish coal miner, and has been a long-time 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.*

# John Kolic's Sterling Hill Mining Diaries

Doug Francisco

**T**his next release of John Kolic's diaries begins toward the end of 1992 with the unstoppable advance of flooding, about to swallow up the 430 level. Another few miles of drifts were about to be lost forever. John is making the best use of his time exploring, specimen hunting, and salvaging anything valuable before it's gone. In these pages of John's diary, he talks about the loss of 340 and 180 levels, as they now no longer are accessible, due to the ever-rising water. The walls and tunnels that witnessed over 200 years of miners' quests for the rich zinc ore became just a dark watery grave, a silent and still place holding only memories for the few of us still around to remember. We owe great gratitude to John for chronicling in his diaries what the miners

were thinking back then, but also the nuts and bolts of what they were doing down there.

The close of 1992 saw the gradual demise of 180 level. Work in the mine now was focused on the creation of horizontal advances for the new tour route for the Sterling Hill Mining Museum. Skim through John's diaries or read every word; you surely will find his accounts interesting. This latest batch of diaries, bringing us to January 16, 1992, will be available on the Sterling Hill Mining Museum website at:

[www.sterlinghillminingmuseum.org/kolics-work-diaries](http://www.sterlinghillminingmuseum.org/kolics-work-diaries)



John Kolic, at a shaft station in the Sterling Mine, preparing to place a Load-Haul-Dump Loader (LHD) onto a carrier for transport to another level.





## **STERLING HILL MINING MUSEUM**

### **Calendar of Events**

The Sterling Hill Mining Museum will reopen on weekends only for general public tours beginning April 2, 2022 at 1:00 PM. Reservations are required, and can be made by calling the mine at 973-209-7212.

The Sterling Hill Mining Museum now is open for private tours and school tours, with a minimum of 15 paying people. Please call the mine to schedule a tour, at 973-209-7212.

The Mine Run Dump will be open every day beginning April 2, 2022, weather permitting. Please call in advance to ensure that staff will be present.

We hope to fully reopen in the not-too-distant future. Please check the Sterling Hill Mining Museum website (<https://www.sterlinghillminingmuseum.org/>) for updated information and announcements.

#### **Saturday, April 23, 2022**

##### **Sterling Hill Pavilion Mineral Sale**

Christiansen Pavilion, Sterling Hill Mining Museum, 30 Plant Street, Ogdensburg, NJ 07439

10:00 AM - 4:00 PM

#### **Sunday, April 24, 2022**

##### **Sterling Hill Pavilion Mineral Sale**

Christiansen Pavilion, Sterling Hill Mining Museum, 30 Plant Street, Ogdensburg, NJ 07439

10:00 AM - 4:00 PM

# Sterling Hill Mining Museum

30 Plant Street • Ogdensburg, NJ 07439-1126

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## CHANGE SERVICE REQUESTED

For more information contact:

**Membership Chairman**

**Sterling Hill Mining Museum**

30 Plant Street

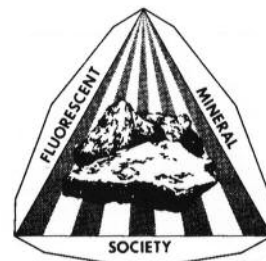
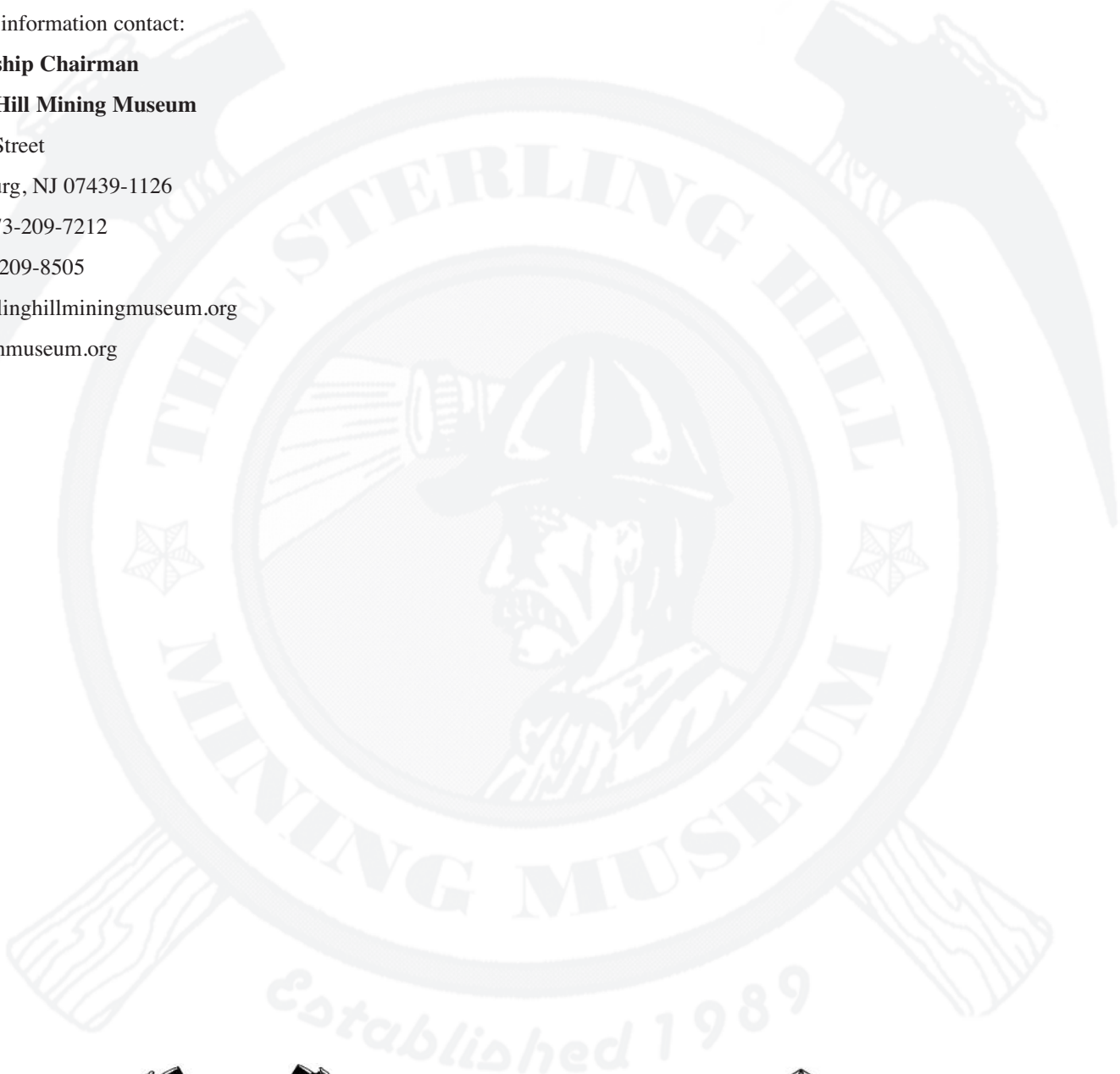
Ogdensburg, NJ 07439-1126

Phone: 973-209-7212

Fax: 973-209-8505

[www.sterlinghillminingmuseum.org](http://www.sterlinghillminingmuseum.org)

[info@shmmuseum.org](mailto:info@shmmuseum.org)



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