Bulletin of the Mineralogical Society of Southern California

Volume 95 Number 6 – June, 2022

The 1,002nd meeting of the Mineralogical Society of Southern California

With Knowledge Comes Appreciation

A ZOOM Meeting

June 10th, 2022 at 7:30 P.M.

Program **: Myanmar: A Journey to the Source of the Jade**

Presented By George R. Rossman

In this Issue:

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About the Program: Myanmar: A Journey to the Source of the Jade

Presented By George R. Rossman
Professor of Mineralogy, California Institute of Technology

Myanmar, formerly Burma, has long been known as a country that produces spectacular mineral and gem specimens of world-class quality. When a question arose about determining if lavender color in jade is natural or artificial, it was desirable to obtain a sample of lavender jade at the mine where it would be free of any treatment. Dr. Rossman was presented with an opportunity to travel to Myanmar and to go to the major jade mining district near the city of Hpakant. We will have a chance to follow his trip from Yangon north to Mandalay and then to the northern part of the country where we will visit some of the spectacular sights of Myanmar along the way. We will visit both former and active ruby and spinel mines and finally arrive at large-scale jade mines where much of the world's jadeite is obtained. Also, we will hear a bit about the science behind the formation of these gems and how their color is researched.

		
Lavender Jade	Spinel in limestone	Carving Limestone Statues

George R. Rossman: Is Professor of Mineralogy in the Division of Geological and Planetary Sciences, California Institute of Technology, Pasadena, California. He got his B.S. degree in Chemistry and Mathematics from Wisconsin State University, Eau Claire, and his Ph.D. from Caltech in Chemistry. His principal research interests deal with the use of spectroscopic probes to study minerals. His work addresses problems relating to the origin of color phenomena in minerals; spectroscopic methods for phase identification; and the special role of metal ions in minerals. He and his students also develop analytical methods for OH analysis and they examine the mode of incorporation of hydrous components in solids and their role in modifying physical and chemical properties. He is also interested in the long-term effects in minerals from the exposure to background levels of natural radiation. He was the recipient of the inaugural Dana Medal, of the Mineralogical Society of America in 2001, the Richard P. Feynman Prize for Excellence in Teaching at the California Institute of Technology in 2004, the Friedrich-Becke Medal of the Austrian Mineralogical Society in 2005, and this year's Roebling Medal of the Mineralogical Society of America. He was also honored by having two new minerals of the tourmaline family named after him. He has more than 380 publications in the mineralogical and chemical sciences.

Websites: George Rossman: http://minerals.gps.caltech.edu/grr/index.html
The mineral spectroscopy server: http://minerals.gps.caltech.edu/

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From the Editor: Linda Elsnau

Well, Memorial Day is past and Summer is soon officilly here. Shows in the area are slowing down for the summer and (hopefully) summertime field trips can start happening. If you do go out into the field, watch the weather and be sure to carry plenty of water and other supplies to stay safe, It looks like George has an excellent program for us this month so try not to miss it.

I am also attaching a special flyer prepared by our Board. MSSC really needs your help. Please think hard as to what you can do to help.

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FROM THE PRESIDENT: Mineral Groups. Installment 1 "The Amphiboles" by George Rossman

Previously I have been writing about specific minerals. Now, I will discuss mineral groups that we encounter. I begin with a very common group of rock-forming minerals known as the amphiboles. The name 'amphibole' comes from a Greek word for 'ambiguous' because amphiboles have so many different appearances and specific chemical formulas.

The general structural formula for the amphiboles is:

$$A\,(M4)_2\,\{[(M1)_2,M3\,](M2)_2\}\;\;T_8O_{22}\,(OH,F)_2$$

where each of the symbols (A, M1, M2, M3, M4 and T) represent a particular site in the structure where metal ions reside and O, OH, and F represent oxide, hydroxide and fluoride, respectively.

First, we will look at the way these sites group together to define the structure of amphiboles before we consider the chemical components in the sites. A defining feature of the amphibole structure is the double chain of tetrahedral sites that runs along the c-axis of the crystal. **(Figure 1). Figure 2** shows how the M1, M2, M3 and M4 cation sites assemble into wide ribbons that also run along the c-axis of the crystal. Finally, we see how the individual units stack together to form the greater structure **(Figure 3).** In **figure 4** we also see where the "A" sites are located in the open space between the upper and lower set of tetrahedral sites.

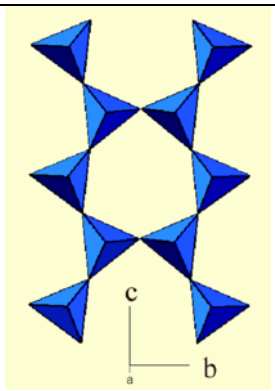

Figure 1. The double chain of tetrahedral sites that constitute the backbone of the amphibole structure.

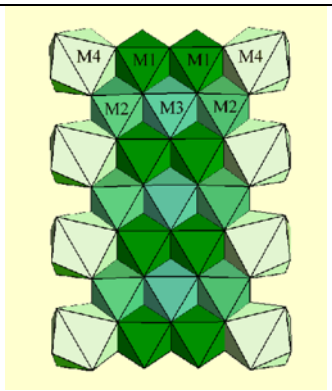

Figure 2. The packing of the cation sites in the amphibole structure.

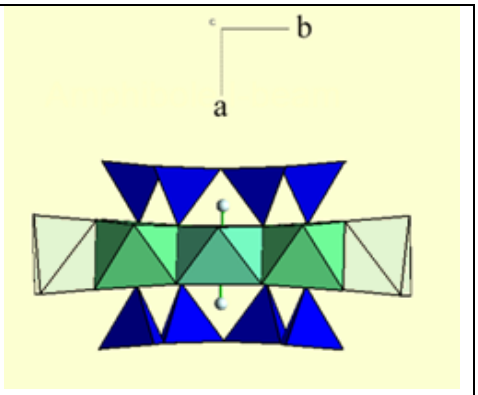

Figure 3. Stacking of the tetrahedral chains onto the ribbons of M-sites.

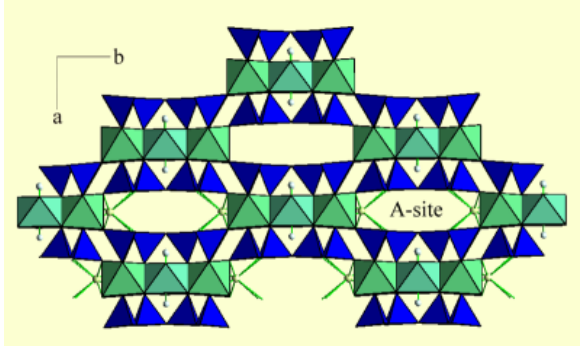

Figure 4. The overall stacking of the tetrahedral sites (in blue) and the cation sites (in green) in the amphibole structure.

Next, we consider the chemical composition of the amphiboles. The cation in the 'A' site commonly is either calcium (Ca), sodium (Na) or potassium (K) or even a vacancy. The M4 site usually contains either calcium, iron (Fe) or magnesium (Mg). The M1, M2, and M3 sites are often Mg, Fe, aluminum (Al), chromium (Cr), manganese (Mn) or titanium (Ti). The tetrahedral sites are usually either silicon (Si) or aluminum. All these different possible chemical components give rise to a whole bunch of different compositions which give rise to a whole bunch of amphibole species names.

Let's look at just a few of the more common ones. Tremolite ideally is $Ca_2Mg_5Si_8O_{12}(OH)_2$. If it had this ideal composition, it would be colorless. Such colorless tremolites do occur such as the one in **Figure 5**. Small amounts of chromium turn them green **(Figure 6)** while manganese in the

Figure 5. Colorless tremolite from Canaan, CT. Photo credit: Mark Garcia

Figure 6. Chromium tremolite from Tanzania. Photo credit:GRR

Figure 7. Manganese-containing tremolite from Balmat, NY. Photo credit: GRR

3+ oxidation state makes them the violet color in **Figure 7**. As a modest amount of iron replaces the magnesium in tremolite, the name changes to actinolite. Actinolites are commonly green in color **(Figures 8, 9, 10).**

Figure 8. Actinolite from Humboldt County, CA. Photo credit: Mark Garcia

Figure 9. Actinolite from Salasvatn, Norway. Photo credit: Mark Garcia

Figure 10. Actinolite from Catalina Island, CA. Photo credit: Mark Garcia

Also, nephrite jade is a fine-grained actinolite. **Figure 11** shows a translucent nephrite from Siberia.

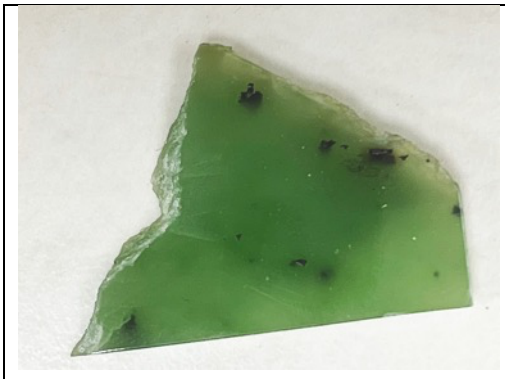

Figure 11. Nephrite from Siberia. Photo credit: GRR

Glaucophane and riebeckite form a continuous series in which Mg^{2+} replaces Fe^{2+} and Fe^{3+} replaces Al^{3+}. The A-site is vacant in these two minerals. Their chemical formulas are:

Glaucophane = $Na_2(Mg_3\ Al^{3+}{}_2)\ Si_8O_{22}\ (OH)_2$; Riebeckite = $Na_2(\ Fe^{2+}{}_3Fe^{3+}{}_2)\ Si_8O_{22}\ (OH)_2$

When the proportions of Fe^{2+} and Fe^{3+} are just right and their respective concentrations are on the low side, blue amphiboles are the result. We see a lot of these along the western coast of California and on Catalina Island

(Figure 12). Darker crystals can occur **(Figure 13)** as well as fibrous varieties known as crodicolite asbestos which do present a health concern **(Figures 14, 15).**

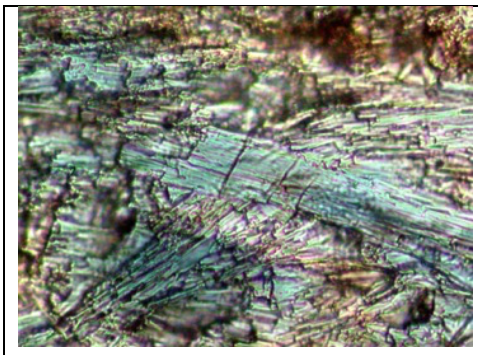

Figure 12. Blue glaucophane from Catalina Island.
Photo credit: GRR

Figure 13. Dark Glaucophane from Cloverdale, CA.
Photo credit: Mark Garcia

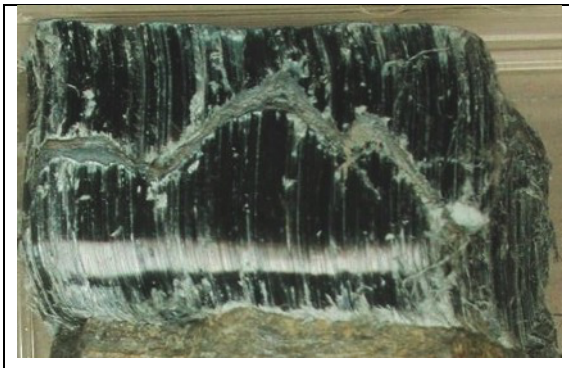

Figure 14. Fibrous riebeckite from Kuruman, S. Africa.
Photo credit: Mark Garcia

Figure 15. Fibrous riebeckite from Western Australia.
Photo credit: Mark Garcia

Hornblende

Hornblende is *not a name of a mineral species.* It is a term to designate a common black calcic amphibole with all sites involved in multiple substitutions **(Figures 16-18).** Often hornblende is really either the mineral species edenite or pargasite. In each of these species, the "A-site" is occupied by sodium.

Edenite = $NaCa_2(Mg,Fe)_5Si_7Al\ O_{22}(OH)_2$; Pargasite = $NaCa_2(Mg,Fe,Al)_5Si_6Al_2O_{22}(OH)_2$

Figure 16. Hornblende in a rock from the Mt. Gleason area of the San Gabriel mountains.
Photo credit: GRR

Figure 17. A hornblende crystal from Chelan Co, Washington.
Photo credit: Mark Garcia

Figure 18. A hornblende crystal from Hurricane, NH.
Photo credit: Mark Garcia

There are a lot of other amphibole species. Currently there are more than 110 of them. They include minerals such as afrvedsonite **(Figure 19),** ferrotremolite **(Figure 20)** and richterite **(Figure 21)** just to name a few.

Figure 19. Arfvedsonite from Okanogan County, WA.
Photo credit: Mark Garcia

Figure 20. Ferrotremolite from Babbitt, MN.
Photo credit: Mark Garcia

Figure 21. Richterite from Afghanistan.
Photo credit: GRR

How can you tell if you have an amphibole? An important diagnostic test for amphiboles is the 120-degree cleavage angle **(Figure 22).** Pyroxenes that can appear similar to amphiboles have a cleavage angle of nearly 90 degrees. Look down the c-axis and see what you see. How do you tell which species of amphibole a particular specimen is? You spend a bunch of money and have it chemically analyzed. Amphiboles are very common. You should have some in your collections.

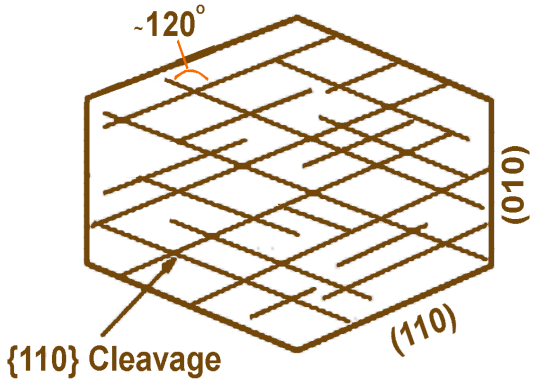

Figure 22. The cleavage angles of amphiboles looking down the c-axis

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MINUTES of the May 13, 2022 ZOOM Meeting

Call to Order (Dr. Rossman):

At 7:32 p.m., the 1,001st Membership Meeting of the Mineralogical Society of Southern California (MSSC) was called to order by President Dr. Rossman, Ph.D. It was MSSC's 24th ZOOM conference Membership meeting, 7th under MSSC's license; two years of ZOOM meetings which has been the COVID result. It has expanded our audience by having people come from far afield, like tonight, Miko from Indonesia is part of our audience.

President's Remarks (Rossman)

Dr. Rossman reports that the International Mineralogical Association (IMA) has approved 5,793 mineral species, up from last month. One newly approved mineral is **elliottite**, $NaMgAl_3(PO_4)_2F_6{\cdot}9H_2O$, a hydrated sodium magnesium aluminum fluoral phosphate from South Australia. Of particular interest, one of our own members, Dr. Anthony (Tony) Kampf, Ph.D., was one of the team that actually characterized this as a new mineral. Tony is now one of the world's most prolific characterizers of new mineral species. Kudos, Tony!

Regular Business (Rossman)

Approval of Minutes: First order of business is approval of the April 8, 2022 Minutes (MSSC's 1,000th meeting) as published in the May 2022 Bulletin. Dr. Rossman called for any corrections or additions and seeing

none made a call for a vote to approve. The minutes were approved unanimously and declared passed as presented in the Bulletin.

Announcements and Reports

1. Informal social gathering (Ahni Dodge): Ahni announced that there will be an informal dinner at Kathleen's (on Lake Ave.) on June 11, 2022 at 5 p.m. Please e-mail Ahni if you're interested in joining: ahni@me.com

2. Fieldtrip Report (Marek Chorazewicz): Marek provided an update on the last field trip saying there was good weather, and 3 sedans actually made it to the mine. There were finds of strontianite, jasper and other things that are currently being investigated. As for the Fall, the plan is a couple of days at the beginning of October (day 1) Tecopa opals and (day 2) trilobites. At another time, off to Barstow where there are some prospects and veins with big blades of hematite in quartz and a rare phosphate mineral, lazulite. Check MSSC's website for notices and information about these and other field trips. Dr. Rossman said he'd been to find Tecopa opals, which are found in the dry lakebed and are small but spectacularly beautiful.

There being no other MSSC business, the meeting was turned over to Program Chair, Rudy Lopez to introduce the night's speaker, Michael Kaas, known as "Miner Mike".

Program

Rudy tells us Michael Kaas is coming to us from Virginia and will speak about America's first silver mine supplier of lead for the Confederacy, the Silver Hill Mine. "Miner Mike" will tell us about the Davison County, North Carolina important underground mine. Mike is a retired mining engineer who has been employed by the U S Bureau of Mines and by IBM. He also does independent work for several mining companies. He was an early innovator in the development of computer applications for the mining industry. During his 20 years with the US Bureau of Mines, he was responsible for programs in mineral information and analysis, resource evaluation, mineral land assessment and environmental research. He is an author of several technical and mining history papers.

Kaas states that one of the great things about ZOOM is that it's good for mineral clubs. There are 4 in the immediate Washington, D.C. area; some of the clubs have attendees from all over the world and it's been great!

Starting his presentation, "The Silver Hill Mine: America's First Silver Mine and Supplier of Lead to the Confederacy", Mike opens with a map close-up of the Greensboro area in North Carolina. It shows the mine's location between Greensboro to its north and Charlotte to its south. He also mentions Austinville, Raleigh and Richmond, each an important location in relation to the Silver Hill Mine. Silver Hill Mine is located in the Cid mining district.

We use the Silver Hill Mine, when we talk about it being the first silver mine, a little loosely. There are places around the country, particularly in Western States, where indigenous peoples may have used acquired mines for silver. But, in terms of a formal mine, this one fits the bill.

We can see up Interstate 77, is Wytheville which is about 10 minutes by car from Austinville, a long time lead then zinc producer – the longest operating lead mine in the United States. It supplied lead to George Washington and to the southern states during the Civil War. The works were bought up around 1902 or 1904 by New Jersey Zinc and they operated it until 1982, so it had a long history. During the Civil War, Austinville was the primary source of lead and Silver Hill was a backup supply. This really gave 2 potential sources of lead.

During the Civil War period, there were 5 critical and strategic minerals: (1) coal and iron ore from VA for heat and naval ship siding, (2) lead from VA and NC, (3) copper from TN, (4) salt to preserve meats from VA and (5) niter [potassium nitrate, salt peter] for gun powder from Appalachia. There was an extensive rail transportation network that moved most of the minerals and materials. An important fact is that the management of the minerals and materials was an efficient operation for the time.

In 1820's there was a gold rush that brought attention to North Carolina. Silver and lead were discovered in 1838 at Byerly Farm and in1839 after buying the farm, mining started by Roswell A. King (King's Mine became the Washington Mine and then the Silver Hill Mine). Lead pigs (ingots) were shipped to Philadelphia, precious metals were recovered at the U.S. Mint there. Finally, when gold was discovered in 1849 in California, many of the miners from the 1820 NC gold rush fled west to find their fortunes.

Mike shows a specimen of cerussite that was mined at King's mine found in the upper portion of the ore body. The Washington Mine map, drawn in 1845, showed the area where cerussite and native silver was located. The map shows two shafts, the east was only 60 feet and the other was deeper. The thought was to cross from one to the other but that never happened. Mike showed us letters from 1840-43 and a bill of lading (1841) for the transport of lead. These documents are historic and reflect day-to-day business of the period.

The Washington Mine Flowsheet (1843) lists (raw materials) *Mine Ore,* going to a *Bucking House* (hand operation to break out minerals from rock mostly done by youngsters and slaves), then to *Washing Troughs* to "clean" the material, get the mud off. Next is the *Jigging*, a process to separate smaller pieces from larger pieces, like a sifter. Then the material goes into the *Calcining Furnace* (charcoal goes in, sulfur is burnt off) and then next to the *Scotch Hearth* (charcoal and lime in with a slag waste coming out). Finally, *Lead Pigs* (ingots) are produced which are later further refined in Philadelphia, at the mint, to recover silver and gold. All of this was a hand process back then! Mike offers a note about the *Scotch Hearth*, he shows a diagram that has several chambers where the ore is mixed with charcoal and limestone, air is fed into the chamber. Someone would then have to scoop out the molten lead and then fill the hopper with more raw materials for the process to complete a cycle. *[Secy Note: Scotch Hearth is known as a blast furnace.]*

When the mine became known as the Silver Hill Mine, a drawing (1854) of the vertical tunnels shows a 3rd shaft to the west, engine shaft went down about 190 feet then two separate horizonal shafts connected to the middle shaft. Meanwhile, there were other works above, at ground level, including the roasting buildings (*Calcining Furnace* and *Scotch Hearth*). At one time, there were around 70 buildings supporting the mine. As for the mine, as it deepened, sulfides increased, and veins shortened. At surface was native silver and cerussite, at 60' the first galena appeared, at 160' it was all galena then at 200' sphalerite was increasing.

Mike shows Silver Hill Mine specimens housed at the NC State Museum of Natural Sciences (Raleigh): galena with sphalerite, cerussite and a beautiful pyromorphite. From American Museum of Natural History, New York, NY are native silver (oxidized) and pyromorphite. From the Yale Peabody Museum, New Haven, CT comes cerussite and pyromorphite specimens, typical of museum reference specimen and, from Smithsonian Museum of Natural History, Washington, DC is native silver with chrysocolla, cerussite and native silver on gneiss ("country rock" around the mine), silver ore on galena with sphalerite, lead and zinc; all great specimen pieces.

Several types of furnaces were tested during the 1840's-1850's. In a 24-hour period, a *Scotch Hearth* furnace could produce about a ton of lead – a very labor-intensive effort!

Around 1853 a *High Furnace* was used. What distinguished this type was there were 3 of them surrounding a common chimney so they could be operated with less manpower.

The *High Furnace* processed mainly galena and silver. Other furnaces were tested and used at the Silver Hill, as well as in the UK and in Germany, but they never produced a great volume of lead or silver and were unsuccessful.

In 1852-1854 the mine shut down. It re-opened 1855 mainly to get it ready to sell. In 1857 the Silver Hill Mine was bought by Franklin Osgood of the Bergen Point Zinc Company out of New Jersey. Osgood had not been to the mine, but he sent a mine captain, Richard Pascoe and he, Pascoe, sees the zinc potential.

1861 brought the Civil War. Austinville, VA mines are primary source for lead and Silver Hill is the back-up source. The Confederate States of America operates the Niter (gun powder) and the Mining Bureau operates the Silver Hill. Ore is shipped to the smelter in Petersburg, VA, in the northeast. Because the ore was concentrated, this flowsheet was simple: *Mine Ore* is choke fed into a *Roll Crusher* then the ore goes on to

Stamp Mills, next it goes to the *Buddles* (produced tailings) then either *Lead Concentrate* (Pigs/ingots) that went to Petersburg Lead Works or *Zinc Concentrates* (sent to a stockpile) were produced. Mike explains the *stamp mills* crush material by pounding rather than by grinding. Stamp mills were also used in the California gold fields. A *buddle* is an inclined trough that processes crushed ore and uses water to wash away lighter, less valuable portions of the minerals. Buddles were Cornish by design. *[Secy Note: roll crushers are devices that break larger rocks into smaller sizes by use of rollers.]*

Mike goes on to show a ledger listing lead concentrate shipments Oct 1861-Dec1862 and shows a drawing of the Lead Smelter in Petersburg, VA (1865, Reed). After the Civil War, the smelter was destroyed, all the materials were ultimately scavenged, including brick used for buildings.

1866 Osgood regained the Silver Hill Mine and began to ship zinc to New Jersey and in the following 10 years or so, shafts were deepened and mined. By 1882 the ore was depleted.

1898 West Prussian Mining re-opens the mine. In1908 the machinery is sold or discarded, and buildings are dilapidated. 1909-1911 Stevenson Mines open the upper level of the mine and ships 700 ton of zinc concentrate and 225 ton of lead-silver-gold concentrate. In 1940's Stevenson retimbers the north shaft. From 1958-1960 Tennessee Copper Co exploration program deepens the incline shaft to 1300' and 3,000 tons are stockpiled. In 1987 there was a promotion to sell stock in the mine. A photo from c1900 was published showing the miners, some of the buildings and some of the mining equipment. The buildings in the photo look like the mine shaft drawings of 1910, the buildings being at ground level.

Mike displayed photos he took in 2019 of the stamp stands, separator foundations and buddle branch-tailings. He showed aerial view of the Silver Hill Mine as it was in 1958. He also had photos from 1941 of the Stevenson Mill and of how the property looked in 2007. He notes that in 1961, Niagara Capital Corp/Silver Hill Mines, Inc removed the Tennessee Copper stockpile. And, in 2015-2018 in a new exploration for gold, trench sampling was done (WOW, Steve Adams found beautiful pyromorphite!); old shafts were cleaned. Historic mill ruins were located during that excavation, as well as an old stamp head. The land is now barren and shafts are unsafe, filled with water. One of the last slides Mike shows the "Guardian of Silver Hill Mine", a bird (killdeer) sitting on some nonmineralized rocks with a few of her eggs nearby. Mike says that prospecting Silver Hill minerals is best done on Mindat or at museums these days. If you plan to visit the mining area, be sure it's not during hunting season!

Thanks, Mike. You put a lot of research into this historical presentation, especially with the documents you were able to locate. Your presentation had great photos and wonderful commentary! Q&A followed Mike's presentation.

If you would like more information about the Silver Hill Mine, click on the following link:

https://www.mininghistoryassociation.org/Journal/MHJ-v16-2009-Kaas.pdf And, for more information about Richard Pascoe, the mine captain sent by Osgood to the Silver Hill Mine, check out, "Richard W Pascoe, Mine Superintendent" *Mining History Journal 2014* from https://www.mininghistoryassociation.org.

Adjournment

There being no further business, the meeting was adjourned at 8:50 p.m.

Respectfully submitted, Angie Guzman, MSSC Secretary

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With Knowledge Comes Appreciation

List of Upcoming MSSC Events : Mark your Calender!

Event	Date	Comments / Scheduled Program (if known)
Meeting Dates:	**ZOOM** July 8, 2022	Howard Heitner - Minerals in 19th century America.
	ZOOM August 13, 2022	Scott Braley – Collecting at the Red Cloud Mine in Lincoln County, New Mexico
	ZOOM September 9, 2022	Wes Andree; "JMDC: A gem of the Inland Empire
	ZOOM October14, 2022	Leyla Namazie: The structural deformation and evolution of Terranes in the North American Western Cordillera using Paleomagnetism. Undergraduate Geophysics major at UC Berkeley
Board Meeting	**ZOOM** July 10, 2022	ZOOM at 1:00 PM
Field Trip	TBA	No Field Trips Planned at this Time

Note: Dates and programs shown above are subject to change. Check your bulletins to confirm final information each month.

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The Ride Share Listing is being temporarily discontinued until such time as MSSC starts holding in-person meetings again.

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OTHER FREE THINGS TO DO...by Ann Meister

The **Watson Lecture** is on Wednesday, **June 29**. *Each Watson Lecture will begin at 5:00 p.m. Pacific Time. Each lecture runs approximately 40 minutes.* You can view the livestream at **caltech.edu/watson** or on Caltech's YouTube channel. In person attendance at Beckman Auditorium is now available with doors opening at 4:30 PM. See Watson Lecture - Rising Tide: Tackling Sea Level Rise from Above and Below | www.caltech.edu to check for Covid requirements. The speaker is Josh Willis, Project Scientist, JPL. The title of the presentation is **"Rising Tide: Tackling Sea Level Rise from Above and Below."** Global sea level rise is one of the major environmental challenges of the 21st century. As lead scientist for multiple NASA JPL projects, Josh Willis and team are addressing this urgent problem from above and below. The Jason and Sentinel-6 satellites are measuring sea levels from space, and Oceans Melting Greenland, an airborne mission, is probing the island's warming coastal waters to help better predict the rising seas of the future. In this lecture, Willis will discuss how these missions will provide revolutionary data for modeling ocean and ice interactions and lead to improved estimates of global sea level rise. *Find more past Watson Lectures on* Caltech's YouTube channel.

The **Von Kármán Lecture** information is not yet available for the June lecture. Check the website: Lecture Series (nasa.gov)

The **UCLA Meteorite Gallery** monthly lecture will be presented on-line on Sunday, **June 19** at 2:30 PM. The speaker is Dr. Julia Cartwright, University of Alabama. The title is not yet available. **Zoom Registration:** https://ucla.zoom.us/meeting/register/tJEqduyupj0vGd3S0_52FsbHTbPjYr0sZQUj
If you need detailed instructions on how to join a meeting via Zoom please contact our Curatorial Assistant, Juliet Hook, at jahook@ucla.edu. Note: Registration is only needed once as this is a recurring meeting in Zoom. The speaker and topic will be announced on the website. Visit the website and check on events and videos and other neat things about meteorites, go to https://meteorites.ucla.edu

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MSSC Advertisement Policy:
Mineral-related ads are allowable in the MSSC bulletin. Below is the price per month

Business Card	$5.00
1/3 page	$10.00
1/2 page	$20.00
Full Page	$35.00

In addition, any advertiser who purchases 12 months of space in advance will receive a discount of 12 months for the price of 10 months. The copy for the ads should be mailed to the editor at bulletin@mineralsocal.org and the payment should be sent to the
MSSC Treasurer 13781 Alderwood Lane, #22-J, Seal Beach, CA 90740

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Calendar of Events:

Only local area shows are listed here. Other CFMS Club shows can be found at: http://www.cfmsinc.org/

June 11-12, 2022 – Escondido, CA
Palomar Gem and Mineral Club
Palomar Gem and Mineral Show
California Center for the Arts, 340 N. Escondido, Escondido 92025
Hours: Sat 10 AM – 5 PM, Sun 10 AM – 4 PM
Website: http://palomargem.org

July 16-17, 2022 – Culver City, CA
Culver City Gem & Mineral Society
Fiesta of Gems
Veterans Memorial Auditorium, 4117 Overland Ave., Culver City, 90230
Hours: Sat 10 AM – 6 PM, Sun 10 AM – 5 PM
Website: http://CulverCityRocks.org/fiesta.htm

August 5-7, 2022, Nipomo, CA
Orcutt Mineral Society
Nipomo High School, 525 N. Thompson Ave., Nipomo, CA 93444
54th Annual Rainbow of Gems Show & Sale – "OMS Rocks the Central Coast"
Hours: Friday & Saturday 10 AM – 5 PM, Sunday 10 AM – 4 PM
Website: http://omsinc.org

This One Needs To See A Dentist!

Wulfenite
Locality: Blue Bell Claims
Clark Mtns, Baker,
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Historian	Ann Meister	
Hospitality	Laura Davis	
Membership	Cheryl Lopez	membership@mineralsocal.org
Micro Mount Conf. Chairman	Al Wilkins	
Program and Education	Rudy Lopez	programs@mineralsocal.org
Webmaster	Leslie Ogg	webmaster@mineralsocal.org

About the Mineralogical Society of Southern California

Organized in 1931, the Mineralogical Society of Southern California, Inc. is the oldest mineralogical society in the western United States. The MSSC is a member of the California Federation of Mineralogical Societies, and is dedicated to the dissemination of general knowledge of the mineralogical and related earth sciences through the study of mineral specimens. We are a scientific non-profit organization that actively supports those endeavors through public outreach, field study and related programs. The Bulletin of the Mineralogical Society of Southern California is the official publication of the Mineralogical Society of Southern California, Inc.

The MSSC meetings are usually held the second Friday of each month, January, February and August excepted, at 7:30 p.m. in Building E, Room 220, Pasadena City College, 1570 E Colorado Boulevard, Pasadena, California. However, due to current health considerations, MSSC meetings are held via ZOOM conferencing until further notice**.** The annual Installation Banquet is held in January, and the annual Picnic and Swap Meeting is held in August Due to PCC holidays, meetings may vary. Check the Society website for details.

The Society also sponsors the annual Pacific Micro mount Symposium held at the Fallbrook Mineral Museum during the last weekend of January.

Annual Membership dues for the MSSC are $30.00 for an individual membership, $40.00 for a family membership. Bulletins are delivered by email, there is an additional annual fee if you prefer paper bulletins mailed to your address. The Society's contact information:

Mineralogical Society of Southern California
13781 Alderwood Lane, #22-J, Seal Beach, CA 90740
E-mail: *treasurer@mineralsocal.org*
Website: ***www.mineralsocal.org*** **The Mineralogical Society of California, Inc.**

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MSSC Bulletin Editor

3630 Encinal Ave.

Glendale, CA 91214-2415

To:

With Knowledge Comes Appreciation

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