



*The Mineralogical Society of the
District of Columbia*



THE MINERAL MINUTES

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- September's Meeting is Wednesday, 7 September. We will be meeting at 7:45pm in the lobby of the Museum of Natural History. Dinner at the Elephant and Castle at 6pm for those interested in dining beforehand.

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Prez Says...

By David Nanney,
MSDC President

We just finished three consecutive days of 100 degrees or more. So I am looking so forward to the fall and cooler weather. I am writing this two days before Leslie and I leave to visit Kate in Seattle, attend a wedding in Portland (100 degrees this Saturday. That's so wrong!!!). And then to



Anchorage to visit my aunt and several cousins. They are having temperatures in the 50s, so we will probably be happily chilly.

When we visited Anchorage the last time, we took a geode found by our nephew in Arizona to a rock shop called Natures Jewels. Joe Turnbull, the owner, took time to take my grandnephew into the back room where he let him use a rock saw to cut it open "DIAMOND!!!" was the delighted shout as Jerod opened the rock for the first time. What a treat and what a nice guy. So yes, visiting them is high on our list for this visit for sure.

September will start off with our own Kathy Hrechka presenting a program on Diamonds. We all know just how animated Kathy is so this will be a great presentation. Come join Kathy at dinner before the talk at the Elephant and Castle at 6PM. Let us

September Program – “Diamonds are a Girl’s Best Friend”

Presented by
Kathy Hrechka

“A kiss on the hand
May be quite continental,
But diamonds are a
girl's best friend.”

– Lorelei Lee
(Marilyn Monroe)

in “Gentlemen Prefer Blondes”



Our presenter this month is member, Kathy Hrechka, an avid micromounter with a special affinity for diamonds. Kathy sees the world much like Lorelei Lee and has amassed a large collection of diamonds (micromounts) of varying crystal forms, sizes, and colors, from a surprising number of localities. She was encouraged to pursue her passion for collecting diamonds by various notable mineralogical mentors including Paul Seel, Jim Hurlbut, Fred Schafermeyer, and others and will tell us about that journey as part of her presentation.

Kathy’s presentation will include discussion of the science, history and lore of diamonds, and will include pictures of many of the diamonds in her collection. The science starts with the story of their formation at great depths and pressures

know if you are going to join us so we can make the reservations.

If you picked up a treasure during the summer, bring one to the meeting for show and tell. You will have one minute to summarize your find, followed by sharing during the refreshments. .

below the earth’s crust and how they get from there to the surface (Volcanos!) where we find and appreciate them. Diamonds also have a number of physical properties of great interest such as fluorescence (on occasion), thermal conductivity, hardness (10 on the Moh’s scale), and optical properties such as a high index of refraction, high dispersion, and high luster. Their high index of refraction, hardness, and clever marketing have made them the “go to” stone for engagement rings.

Kathy enjoyed a long career as an airline flight attendant with USAirways. Now retired, Kathy enjoys travel and also volunteers at the Smithsonian Institution as a docent in the Janet Annenberg Hooker Hall of Geology, Gems and Minerals. She also volunteers in Q?rius, the education zone designed for teens at the museum.

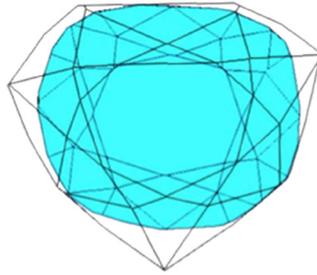
Please join us in taking Kathy to dinner on September 7th before the club meeting. We will be meeting at 6:00 pm at Elephant & Castle Restaurant, 1201 Pennsylvania Ave, NW, Washington, DC, about 2 blocks from the Smithsonian Institution National Museum of Natural History (NMNH) where our club meeting is held. If you cannot make it to dinner, we

will meet in the NMNH lobby at 7:30 pm (Constitution Avenue-side lobby) from

which we will head up to the Cathy Kerby Room for Kathy's presentation.

Lost and Found Archives

By Dave Hennessey



Lost (September, 1792): One large deep blue diamond, known as the “French Blue”. Original uncut stone weighed 112 carats and was acquired in India by French merchant traveler, Jean Baptiste Tavernier. Sold to King Louis XIV of France in 1668 and recut to a 67 carat stone. Lost during the French Revolution from the French Royal Treasury during the looting of the crown jewels. If you have information on this missing diamond, please contact the French government immediately. Reward offered. Finding the stone is urgent since Napoleon's government has issued a law providing for a 20-year statute of limitations on crimes committed during the revolution. Criminal liability for the theft will end in 1812.

Found (in 1812, 20 years and 2 days after the French Blue was stolen): A large deep blue 45.5 carat diamond. Acquired from a London diamond merchant by King George IV of the United Kingdom. Sold at his death (1830) through private channels to Henry Phillip Hope, passing through many hands thereafter including Cartiers, Evelyn

Walsh McLean (owner of the Washington Post), and Harry Winston Inc., which donated the stone in 1958 to the Smithsonian Institution where it remains a premier attraction to this day.

Speculation that the Hope Diamond is the French Blue, recut to hide its origins, began soon after the diamond made its first appearance. Drawings of the French Blue survive and the Hope Diamond shape fits nicely (but tightly) within the shape of the French Blue. In 2007, an inventory update of the mineral and gem collection of the Museum National d'Histoire Naturelle in Paris turned up a lead cast of the French Blue. The cast allowed precise calculation of the stone's shape and dimensions through laser scanning, and for the creation of three-dimensional computer models and replicas of the missing stone. The detailed geometric modeling and studies confirmed that the Hope Diamond could have been cut from the French Blue. Confirming the validity of the analysis, the Smithsonian Institution website recounts the origins and history of this remarkable stone and affirms

that the Hope Diamond is in fact the former French Blue that disappeared 324 years ago.

Minutes of the Business Meeting of June 2016

Dr. Andy Thompson, Secretary

Business Meeting Synopsis - 1 June 2016

President Dave Nanney welcomed everyone to the June meeting and thanked the attending past MSDC Presidents for their service to the club. He then welcomed two guests, Tim and Justin and each shared their interests in collecting minerals which were diverse for Tim and a special interest in Egyptian marble and gem stones for Justin.

- Over the past months, three members, Yuri Kalish, Leslie Nanney and Susan Fisher agreed to serve as directors on the club's board. Dave called for a formal motion that they be voted in for terms of 3, 2 and 1 year respectively. The attending members voted unanimously to approve the slate and applauded the team for their willingness to serve.

- Geology in the News: John Weidner had initiated an email discussion among board members about the relative merits of Mindat.org and Webmineral.com. Members indicated they were more familiar with and preferred to use the former. Susan and Erich said that the reliability of all such sites was always a question and that Mindat had an advantage because it was built to accommodate ongoing updates to allow for needed corrections.

- Bob Cooke called attention to the article in the Washington post for 1 June which reported the Rosetta probe orbiting

Comet P67 found spectrographic evidence of the presence of glycine, a simple amino acid which can build more complex proteins supporting life. Because it was detected in the gas cloud off-gassing from the comet, there was no likelihood of its presence being attributed to human contamination.

- Eastern Federation Region IV News: Susan Fisher provided a handout describing the upcoming annual Potluck Picnic and Rock Swap/Sale on 18 June, sponsored by the Southern Maryland Rock and Mineral Club. She encouraged participation, provided directions and noted there would be a bounty of inexpensive mineralogical books on sale donated by our own recently deceased and much missed Cynthia Payne.

Financial Report: Treasurer John Weidner passed out a summary sheet of the club's finances and called attention to the fact that he recently closed the previously little used P.O. Box mailing address. Future correspondence should be addressed directly to John.

Miscellaneous items: Ed Fisher had no news to report on the membership front. The May business meeting minutes were voted upon and accepted as published in the June Mineral Minutes. Dave thanked Yuri, Leslie and Andy for providing snacks for the evening's post-presentation social discussion time and Dave recruited Ken and John who volunteered to provide such for the September meeting. Dave Hennessey noted he is looking forward to the Eastern Fed Wildacres session in early September.

Several members engaged in a discussion about the definition of a nanosecond (billionth of a second) and the contributions of famous Admiral Grace Hopper with whom several members of MSDC had considerable contact over the years.

June Program Synopsis: “Mississippi Valley-Type (MVT) Deposits - Fluorite and Friends”

**Presented by Susan Fisher
Synopsis by Dr. Andy Thompson, Secretary**

Dave Hennessey introduced Susan Fisher by providing an overview of her early academic and impressive professional experiences and competencies. Interestingly, none of those were geologically based and yet her mineralogical knowledge and skills are widely acknowledged. Respecting that, one of the best ways readers can understand Susan's June presentation would be to read her own description printed in the June Mineral Minutes, pages 2 and 3. The following bullet points highlight several of the salient ideas of the presentation.

- Susan began by sharing a metaphoric fairy tale of how a goat saved civilization. A blacksmith's family discovered that if they used a special “flower” (fluorite) when attempting to melt a new metal (iron), the inclusion of that “flower” (flux) made it possible for the family and village to leap from the copper/bronze age into the Iron Age. Because the mysterious addition lowered the temperature at which the iron would melt and flow, the blacksmith's now stronger weapons saved the day for the village.

- Perhaps similarly, on a global level, the discovery of the metallic deposits identified as Mississippi Valley-Type, which often included “Fluorite and Friends” have

With no further business all voted to close the business meeting and Dave turned the mic over to Dave Hennessey, the V.P. for programs, to introduce the evening's presenter.

made it possible for nations to meet their metal work needs and save their economies.

- Susan shared a basic theory about how these MVT deposits formed starting between 250 Ma and 450 Ma years ago. At that time Pangea's continental plates were crashing together, breaking apart and causing large cracks, vugs and fault lines in deposits sitting upon basement rock. Very hot waters having between 10 and 30% salinity, containing many metallic elements such as lead, zinc and fluorite, systematically crystalized out of solution thereby forming the MVT deposits.

- She provided pictures of numerous beautiful crystals and identified the U.S. mine from which each specimen was collected, along with variations in crystal forms for specific minerals. For fluorine, which is her favorite, she noted that these CaF₂ crystals can be found in seven forms having between 6 and 48 crystal faces and combinations forms are possible.

- The variations in the color are caused by very small amounts of other elements - usually rare earth elements - but which cause the mineral crystals to precipitate out of the saline solution and determine the shape and color of the specimen. The presence of calcium, for example, causes an intense blue or violet color, rare earth elements cause purple, yttrium causes a light blue, etc.

- During the crystallization process, as each component crystalizes out of solution, that changes the chemical composition of the saline fluid and that in turn sometimes causes a recrystallization to occur. Susan showed examples found in the Elmwood

mine in Tennessee. Those crystal shapes are named “Carthage corners.”

- Many fluorites, when illuminated with ultra violet light, do fluoresce, as the name implies, and she showed pictures of those beautiful samples.

- Clearly the origins and processes associated with the mineral formation of MVT deposits are very complex yet Susan made an outline of these events accessible to her audience who were grateful for her aesthetically pleasing illustrated story.

Club members expressed their thanks to Susan for her clear and comprehensible presentation and peppered her with a few additional questions. In response she noted that fluorite today continues to be used extensively in processing iron in the U.S. but iron, other than small amounts of pyrite, is rarely found in the MVT deposits which are largely lead and zinc. Discussion with attendees indicated that the famous mines from the Illinois-Kentucky fluorspar district and Elmwood area mines are now closed but not MVT mines as a group.

In Honor of Fred Ward (1936-2016)

By Dr. Andy Thompson



Mineral collectors and gemstone enthusiasts across the U.S. lost a very good friend this summer. Fred Ward, an award winning photographer, author and publisher of 9 books on gemstones passed away in his Malibu, California home after suffering from

Alzheimer’s related illness. DC area collectors will remember his professionalism, intelligence, personal stories and willingness to share his expertise during his photographically compelling mineral club presentations.

A wider audience enjoyed his photos of minerals published by the National Geographic Society, for whom he worked for several decades. Later he and his wife published nine books on gemstones, including on opals, jade, emeralds, rubies and sapphires, diamonds and pearls. They also published two books on “phenomenal gems” and on how to care for gems.

Colleagues described Fred as smart, having the rare ability to develop expertise across a wide range of professional photographic genres, from intimate portraits of the Kennedy White House, the Beatles first concert in the U.S., to candid shots of Elvis Presley and Elizabeth Taylor and her famous collection of diamond jewelry. When he wanted to get into underwater photography, he became a scuba diver. When he wanted aerial shots he learned to fly a helicopter which he

regularly landed on his Bethesda, Maryland front lawn. It is no wonder that his work for National Geographic, Time, Life and other publications brought him to 130 countries where he snapped many award-winning front cover pictures.

Fred was also very personable and had a fine memory for details. After one presentation he made on sapphires and rubies, I asked him if he knew of any person or company which would heat those raw gemstones to dissolve their internal impurities. He immediately put me in touch with a dealer in Phillipsburg, Montana who, when I mentioned Fred's name, could not have been more responsive.

Fred touched the lives of many people and his work brought into focus the personal lives of celebrities and the poor alike, including the nation's struggle for civil rights in the South. He will be remembered with fondness and his contributions will endure beyond his 81 years

What Was So Revolutionary about the Iron Age?

By Dr. Andrew D. Thompson

Here's a question to get us started. What is a primary connection between David and Goliath, George Washington and Fahrenheit 2300? Not sure? The mineral iron offers unexpected links among them all. Let's explore the cultural and mineral context for these seemingly random names and number to see what we discover along the way.

Mid-summer 2016, newspapers across the U.S. began carrying articles about a new understanding of the ancient Philistines

(Washington Post, 19 July 2016, E2) which challenges the common use of the term "philistine." The Philistines were the mysterious Sea People who dominated the biblical Jews in the centuries before and during the time of King David, roughly 1000 BCE. According to the recently disclosed archeological findings, it turns out the Philistines were not all that "philistine," the derogatory term indicating someone who is indifferent or hostile to cultural, intellectual and artistic values. To the contrary, the recent archeological discoveries in Palestine, including city layouts, warehouses and funerary artifacts all indicate they were sophisticated, highly skilled in metal work, artistic, religious and engaged in international trade. No wonder Delilah, a Philistine, successfully tempted Samson, a Jew.

The bible's first book of Samuel tells the story that the Philistines refused to share their metallurgy with the Israelites. As a result, there was not one blacksmith to be found throughout all of Israel (13:19). Why was that the case? It was simply because the technology for smelting iron was known to only a few people, including the Philistines who shared none of it with the Israelites. The biblical tale tells how the Jews even had to bring their tools to the Philistines in order to be sharpened. The cost, half a shekel was more than a day's wage.

The imaginative biblical story of David and the giant Goliath expresses the very identity of the Israelites as a small tribe defending themselves against a much larger people. It describes the dramatic standoff between the two armies. The Philistine

army had an abundance of men and iron weapons. On the Israelite side, King Saul and his oldest son Jonathan had but two iron weapons, a sword and spear while the rest of the army had none. So it was no wonder they initially had to endure Goliath taunting them for 40 days until the shepherd boy David stepped forward and used his stone-age technology, a sling shot, in a one-on-one duel with Philistine Goliath, and vanquished the iron-age overlords.

For mineralogists, the interesting point is that this biblical story, set in about 1,000 BCE, speaks to the reality that very few cultures had achieved iron-age technology and those who had were understandably reluctant to share it. A famous letter from a Hittite king in about 1250 BCE responded to another monarch telling him his requested order for iron goods has been difficult to fulfill because of a scarcity of high-quality iron. So the king sent the monarch an iron dagger of lesser quality as a token of good will. That king's slowness to share iron raises the unanswered question: was the delay due to deliberate hoarding, an actual shortage or a combination of both?

What we do know, from the consensus of historians, is that it was probably the Hittites of Anatolia (modern day Turkey) and their immediate neighbors, presumably including the Philistines, who initially developed the ability to smelt iron and forge superior weaponry and tools. Scholars of Anatolian history have not discovered the details about early smelting. But it seems that what enabled the iron-age revolution to advance from the technology of the preceding bronze-age, with its

smelting of copper and tin, was the ability to fire forges at higher temperatures (see Table I below), enabling them to work with cast and pure iron ore. Those higher temperatures required for iron contrasted with the lower heat needed to melt copper.

The revolutionary breakthrough was that the iron tools and weapons were structurally superior and had far greater structural strength and durability. All other factors being equal, iron-bearing armies typically triumphed over bronze (copper) bearing armies. Table I illustrates the key factor, the higher temperatures required for smelting iron and the lower temperatures which made working with copper, bronze, silver and gold so commonplace.

Table I. Comparative Melting Points of Copper and Iron

Metal	Melting Point, Fahrenheit
Aluminum	1218
Bronze (Cu(Copper)+Sn [Tin])	1562 – 832
Copper	1981
Cast Iron	2300
Iron (pure)	2786
Gold	1946
Silver (Sterling)	1640

Based on the above chart's figures, what it took was increasing the heat from the 1900 degree level for copper to the 2300-2786 degree Fahrenheit range for the new world of ferrous possibilities to open up to the knowledgeable Anatolian blacksmiths. Additionally, the first iron workers may also have become more capable of melting iron ore by either accidentally or purposely introducing flux minerals – that is reducing

elements which helped lower the melting point of the iron ore.

There was a second characteristic of iron which fueled the iron-age revolution, namely iron's abundant availability. The iron ore was there the entire time, but the smelting technology was beyond every culture until, it seems, the Hittites made the break-through perhaps beginning as early as 1300 BCE. Table 2, below, shows the relative abundance of elements in the earth's crust and points to iron being thousands of times more abundant than copper. There is also evidence that this smelting "advance" played a significant role in increasing wars between nations and perhaps even in mass migrations as iron-age peoples moved against their bronze-age neighbors, both near and far.

Table 2. Abundance of Elements in Earth's Crust

Rank	Element	Symbol	Abundance in Crust (ppm)	Productio 2012 Tons
1	Oxygen	O	461,000	0
2	Silicon	Si	282,000	7,600,000
3	Aluminum	Al	82,300	44,900,000
4	Iron	Fe	56,300	1,100,000,000
26	Copper	Cu	60	17,000,000

Copper, with only 60 parts per million, is scarce in contrast to iron which is almost 1000 times more prevalent in the earth's crust. This abundance meant the iron tools, weapons and armor could be made inexpensively and widely distributed throughout the entire population of civilians and military. The economic implications alone were staggering and propelled large

populations into the ranks of craft persons, better-equipped and more productive farmers, and more effective soldiers.

With this in mind, let's return to our original question about a connection between David and Goliath and George Washington. Clearly, both David and George became national heroes and founding fathers for their respective nations. David's people suffered from a lack of iron tools, as noted above. George Washington's father, to the contrary, added to the family wealth by having an iron forge on his Virginia property. Yet both David and George suffered from a similar fate of colonized people. Just as the Philistines did not share their technology with the Jews, so the British 1750 Iron Act attempted to prevent its world-wide colonies, especially the Americans, from producing iron artifacts. The British demanded the Americans send their raw iron to England where it provided manufacturing jobs at home and produced artifacts which were then taxed and sold back to the colonies at high prices.

For both of those colonized peoples, the Israelites and Americans, the policies on iron encouraged a rebellious revolution which forged new nations and encouraged strong cultural identities. Those two historic clashes were separated in time by almost three millennia. Yet the challenges were similar if not identical: how to take advantage of new technologies without fostering abuse and animosity among neighboring peoples. After becoming free to manufacture iron we know the rest of the story. Over the centuries these two and other cultures have enjoyed multiple

revolutions including the agricultural, industrial and various high tech biomedical and communications advancements. And this pattern has repeated across the generations and across the globe.

Lastly, what about Fahrenheit 2300? As Table I shows, that was approximately the lowest temperature for melting poor quality cast iron. Higher quality iron requires 2786 degrees Fahrenheit for melting (Table I). Before the Hittites and Philistines discovered how to construct and sustain higher temperature forges, they may have experienced occasional successes. That raises an interesting but solvable puzzle.

Archeologists have found some very early artifacts made of meteoric iron, identifiable by the characteristic traces of nickel. Those rare tools or jewelry predated the terrestrial iron Hittite artifacts of King David's time of about 1000 BCE. So without high temperature forges, how could the earlier Hittite, Egyptian and Sumerian people have worked with the meteoric iron, what they commonly called 'iron of heaven?'

Ferrous meteorites are sometimes referred to as garbage cans because beyond the iron and nickel, they typically also contain lots of carbon, sulphur and phosphorus. When the right second or third element is mixed in with the iron ore, they act as flux which lowers or reduces the melting point of the iron ore and allows blacksmiths to work the iron. As far as we know, the science of the late second millennium BCE, 3500 years ago, was not advanced enough to give metalworkers knowledge of diverse elements and how to systematically control flux elements. So in

retrospect, 2300 degrees, the melting point for cast iron, was a barrier to smelting. But it was not known with any mathematical precision.

This tale of discovery raises an interesting question. For today's mineral collectors, are the breakthroughs which are unknown to us but are known to our neighbors? Perhaps this is one of the reasons we join clubs and enjoy exploring the published literature and electronic media. So much of our collecting may seem to be a random gathering of minerals and bits of information. But this life-long endeavor at the individual level pulls us forward and opens the door to personal revolutions in our geologic and cultural understandings. And it is fun. Go team.

Hittite iron dagger:



This following photo and caption depicts an archeological dig of a British bronze-age village from 1000 BCE who were against the iron age culture. The pic and caption are at the very beginning of the article and illustrates the antagonism between the bronze and iron-age peoples.



(<http://www.thedailymash.co.uk/news/environment/bronze-age-village-was-furious-about-iron-age-migrants-20160113105279>)

air pump.

Hittite ritual iron axe:



Assyrian iron age dagger with caption:



Depiction found on an Egyptian tomb, showing an iron smelting blast furnace, with a man operating a foot powered





AFMS – Mid-Year Accomplishments

by Matt Charsky,
President

Editor’s note: The article is adapted from A.F.M.S. News (June 2016), p. 4. Matt is local to our club and has attended many of our meetings, particularly prior to donning the mantle of AFMS president.

At the half-way point of the AFMS fiscal year, I would like to point out some notable accomplishments that the AFMS can be proud of.

Membership: Recently, I received from our Treasurer the membership numbers for 2015-2016 and 2014-2015. In alphabetical order they are:

Federation	2015-2016	2014-2015
CFMS	8,535	8,823
EFMLS	9,398	9,038
MWF	7,891	7,494
NFMS	6,153	6,241
RMFMS	8,517	7,837
SCFMS	3,821	3,694
SFMS	8,145	6,765
Grand Total	52,460	49,892

Two Federations stand out in terms of increased membership from the previous year. Both Federations have had significant increases for the two year period (2015-2016 and 2014-2015). The Rocky Mountain Federation increased membership by approximately 9% in one year on top of the 9.5% increase for the previous year. The big winner, however, is the Southeast Federation, who increased their

membership by a whopping 20% in one year – they added 1380 members in 2015-2016 on top of the 20% increase for the previous year. Will both of these Federations please share with the other Regional Federations how this is being accomplished? In a previous Newsletter article, I volunteered to give bragging rights to the Federation that increased membership the most in the last year and the winner who holds the bragging rights for 2015-2016 is the Southeast Federation! Congratulations on a job well done.

These figures are only intended to show that AFMS is vibrant and growing (increase of approximately 5% from 2014-2015 to 2015-2016). If anything, it makes you want to read the Southeast and Rocky Mountain Federation Newsletters for some helpful tips.

Conservation and Legislation: I realize the last thing anybody wants to do is to read the Federal Register, comprehend legislation like the Wilderness Act of 1964, or try to figure out the actions of Federal Agencies like the U.S. Forest Service or the Bureau of Land Management. Well if we want to keep our collecting areas open for today and the future, we need to speak up now and be heard! I want to commend the work of three Federations for their work behind the scenes on our behalf.

First, the California Federation (in particular, John Martin, our Conservation and Legislation Chair) for getting the word out on terms like wilderness areas, national monuments, and environmental study areas and how they affect and limit our ability to collect minerals and fossils.

Second, the Northwest Federation (in particular, Hidemi Kira, NW President) for sending letters to the Bureau of Land Management on the sage-grouse issue, which could significantly affect a large area in the Northwest where many important rockhounding sites are included

Third, the Rocky Mountain Federation (in particular, Mike Nelson, Chair of the Public Lands Access Committee representing each state within the Rocky Mountain Federation) for sharing information on Federal land collecting.

You may think their effort is a Pacific Coast, Rockies, plains, and mid-west “thing”. Actually, it is an AFMS “thing”. We are all going to have to be part of the solution if we want to continue to collect today and in the future. We need people to speak up and voice their opinion when public comments are asked for.

I hope we can spend some time on this issue at the next AFMS Convention in Albany, OR. It is that important and the time to act is now. Many of us joined clubs for the opportunity to collect minerals and fossils. Let’s not allow collecting trips be taken away from us.

Endowment Fund: The AFMS Endowment Fund Chair has informed me

that we have over 25 items for the drawing to be held at the AFMS Convention in Albany, OR. Please contact your regional representative for tickets – you have to play to win. It is also not too late to donate a piece to the AFMS Endowment Fund.

Junior Activities: The AFMS Junior Activity Chair continues to set records on its badge program. We have excellent junior activity programs so contact us to start up or jump start your club’s junior activities.

I am going to stop here, but I do not want to overlook any of the work performed by other AFMS Committees. We will see the fruits of their labors in Albany, OR at our next AFMS Convention. So be there in person as a delegate or interested member and say hello to me (you can take all the selfies with me that you want). I would like to hear from you on what you think about the AFMS.

Best wishes for a safe and productive summer collecting season and have fun at your club picnics or other summer activities. I hope to see each of you in Albany, OR you will hear from me again after the summer.

‘Till September.
Matt

Mineralogical Society of America Editors’ Picks

With the permission of Keith Putirka, the following are the Editor’s picks of Highlights and Breakthroughs & Invited Centennial Articles from the July 2016 issue of the *American Mineralogist: Journal of Earth and Planetary Materials*. <http://www.minsocam.org>

Highlights and Breakthroughs

Lunar Regolith Metasomatism

On page 1497 of this issue, John Pernet-Fisher reviews new H-isotope analyses by Treiman et al. (p. 1596 of this issue), who suggest that very low dD values

are not indicative of unique mantle reservoirs, but instead are related to “regolith metasomatism”. The lunar regolith has very low dD, due to solar wind and cosmic ray bombardment. In their new work, Treiman et al. recognize that lunar apatite samples having the lowest dD values co-exist with un-zoned olivine and pyroxene grains, and these unzoned grains may indicate long-term equilibration at very slow cooling rates, which may have allowed such basalts to react with underlying low dD regolith materials, that were in turn heated during basalt emplacement.

New Hydrologic Environments on Mars

On page 1499 of this issue Kathleen Benison reviews Ehlmann et al. (p. 1527 of this issue), who present compelling evidence for alunite on Mars. The mineral alunite is more than just a curiosity. As noted by Benison, we have long known that the ancient martian surface was wet. But less well understood are the compositions of those waters. The acidic nature of the martian surface has not been in doubt, given discoveries of the Fe-rich mineral jarosite $[KFe_3(OH)_6(SO_4)_2]$. The discovery of alunite $[KAl_3(SO_4)_2(OH)_6]$, though, not only further confirms that surface waters were locally acidic and S-rich, but Al-rich as well. Alunite is rare on Earth because of the unusual combination of Al- and acidic fluids. But what is rare on Earth might be abundant on Mars. We have yet to take full advantage of our knowledge of rare terrestrial minerals, to better understand the diversity of hydrologic environments on Earth (although work by Hazen and Ausubel, p. 1245 of this volume is a needed

step forward). But such work is perhaps all the more urgent, since as Benison so aptly notes, “Mars’ hydrologic and mineral history is different from, but as complex as, that of Earth”.

Ferric Fe Determinations from the Microprobe? (In Garnets, Yes)

On page 1704 of this issue, Quinn et al. show that the ferric contents of garnets might indeed be obtained by a combination of electron microprobe determinations of total Fe as FeO, and charge balance calculations. The literature is replete with compelling experimental data that show how measured ferric Fe contents are completely uncorrelated with ferric contents determined by charge balance, using electron microprobe analyses of major elements. This failure occurs for a wide range of minerals (e.g., Hawthorne, 1983, *Can Min*; Dyar et al. 1989, 1993, *Am Min*). However, Quinn et al. show that garnet may be an exception to the rule. Ferric Fe contents obtained from electronic microprobe analyses and mineral stoichiometry match Mossbauer determinations of the same and that errors of estimation are especially low at high total FeO contents (± 0.05 at > 15 wt% FeO total). Although not specifically explored by Quinn et al., this work opens the possibility of estimating oxygen fugacity from microprobe analyses of metamorphic and igneous garnets.

Magma are More Water Rich Than You Think

On page 1691 of this issue, Esposito et al. discover liquid H₂O and H₂O-CO₂

vapor in bubbles of olivine-hosted melt inclusions. Their results show that water moves freely between the vapor and melt (glass) phases and that low water contents in what are necessarily CO₂-rich bubbles are not evidence for a dry melt or a CO₂-rich source. Instead, low water contents of bubbles may simply reflect post-trapping exsolution loss of water from a bubble into co-existing glass, or the precipitation of water as an annulus about the bubble wall. The annulus can be quite thin, and so optically undetectable, but compositionally molecularly significant. For example Esposito et al. estimate that this easily undetected water might account for as much as 20-60% of the total water budget of a given melt inclusion, depending upon the bubble/melt-inclusion volume ratio, the size of the melt inclusion, and the initial H₂O content of the trapped melt. Their data also show that S contents of melt inclusions might also be underestimated if bubbles and their annuli are not accounted for in the mass balance. Their results emphasize that great care must be taken to obtain accurate reconstruction of volatile contents of sub-surface melts based on analysis of melt inclusions."

Recording UHP Metamorphic Reactions

On page 1696 of this issue Ague and Axler propose that minor elements in

garnet, such as Na, Ti and especially P, provide a faithful record of prograde and retrograde metamorphic paths, compared to other minor or major elements that more easily diffuse through the garnet structure. In their study, they examined zoning patterns in garnets obtained from high pressure and ultra-high pressure (diamond-bearing) granulites. Their work reveals fine-scale zoning patterns for P that are invisible in Ca or Mg profiles. They suggest that the fine-scale growth patterns observed for P, Ti, and Na record dissolution-precipitation reactions that are driven by prograde and retrograde metamorphic reactions. We appear to have insufficient understanding of metamorphic equilibria to translate P or Ti zonation to specific estimates of temperature and pressure, but experimental studies of such might prove to be gainful employment.

Disappearing Diomignite

On page 1700 of this issue, Anderson reports on the recent discreditation by IMA of diomignite (Li₂B₄O₇) as a valid mineral species. The lack of evidence for diomignite's existence negates the inferred role of a Li₂B₄O₇-flux-rich melt in the generation of primary pegmatite textures and rare element oxide mineralization in the Tanco pegmatite, Manitoba.

Useful Mineral Links:



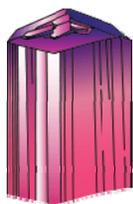
Eastern Federation of
Mineralogical and
Lapidary Societies
(EFMLS)

www.amfed.org/efmls



American Federation
of Mineralogical
Societies (AFMS)

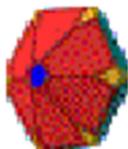
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The Geological
Society of America
(GSA)

www.geosociety.org

Upcoming Local (or mostly local) Geology Events:

September:

- 3 – 4 27th Annual Rockhounters Gem & Mineral Show sponsored by the Kennebec Rocks & Minerals Club. National Guard Armory, Western Ave; Augusta, ME. Contact: <ronlep@midmaine.com> or 207-873-6270.
- 7 MSDC September Meeting

- 10-11 53rd Annual Gem, Mineral & Fossil Show sponsored by the Northern Berkshire Mineral Club. Fraternal Order of Eagles Aerie #310, 515 Curran Hwy, Rt 8; No. Adams, MA. Contact: Larry Michon lmichon@rcn.com or 413-663-8430.
- 24-25 52nd Annual Atlantic Coast Gem, Mineral, Jewelry & Fossil Show hosted by the Gem Cutters Guild of Baltimore. Howard Co. Fairgrounds, West Friendship, MD. Contact: gemcuttersguild@gmail.com
- 24-25 Franklin, NJ - 60th Annual Franklin-Sterling Gem & Mineral Show Sponsored by the Franklin Mineral Museum When: September 24th & 25th 2015. Times: Saturday 9:00 am - 5:00 pm, Sunday 10:00 am - 4:00 pm., Where: Franklin School, 50 Washington Ave., Franklin, NJ. Admission: \$7.00 Adult, \$4.00 child (6-16) Additional information about the show: They expect to have 2000 attendees over the course of 2 days. Vendors are always great and professional with each other. They work in conjunction with the Franklin Mineral Museum to plan a successful yearly event and each year try to branch out to gain a larger more widespread audience in hopes to generate more interest into the Mineral Museum, Gems, Minerals, and beautiful pieces that our vendors showcase. Franklin Mineral Museum sponsors this show as their only large fundraising event that helps pay for the operations of the Mineral Museum. The Museum is a non-profit organization that provides educational trips, information and a great museum that explains the history of mining. The show is held at the Franklin Elementary School, 50 Washington Ave, Franklin, NJ 07416. Located right down the street from the museum. Their Show Page: <http://spmom3.wix.com/franklin-gem-mineral> Their Facebook Page: <https://www.facebook.com/AnnualFranklinSterlingGemMineralShow>
- 26 NVMC September Meeting
- 28 Micromounters September Meeting
- October:
- 5 MSDC October Meeting
- 14-16 The Baltimore Mineral Society is pleased to announce the 60th Annual Paul Desautels Micromount Symposium at The Friends School of Baltimore, 5114 North Charles St; Baltimore, MD 21210. Registrations will be accepted by mail or will be taken at the door either Friday night or Saturday morning. We encourage you to pre-register by mail prior to October 3rd. REGISTRATION FEE: Fee for the Symposium this year will be \$30.00 in advance or \$35.00 at the door. Please make checks payable to the Baltimore Mineral Society. Send completed form to: Carolyn Weinberger PO Box 302 Glyndon, MD 21071-0302 (includes dessert on Friday evening and light lunch on Saturday). Dinner will be on your own at local restaurants both Friday and Saturday evenings.
- 22-23 Rochester, NY - Rochester Gem, Mineral, Jewelry & Fossil Show & Sale and 66th Annual EFMLS Convention hosted by the Rochester Lapidary Society. Main Street Armory, 900 E Main St; Rochester, NY. Info: <www.rochesterlapidary.org/show>. EFMLS Annual Meeting, Friday, October 21.

- 24 NVMC October Meeting
- 26 Micromounters October Meeting

November:

- 2 MSDC November Meeting
- 5 – 6 47th Annual Fine Gem, Jewelry & Mineral Show – Gemarama 2016 sponsored by the Tuscarora Lapidary Society. Greater Philadelphia EXPO Center at Oaks, Hall C. Contact: Amy Karash <amy.karash@gmail.com>.
- 19-20 25th Annual Gem, Mineral & Fossil Show sponsored by the Northern Virginia Mineral Club. The Hub Ballroom at George Mason University. Braddock Rd & Rt. 123, Fairfax, VA. Contact: <novamineralclub.org>
- 23 Micromounters November Meeting (subject to change based on Thanksgiving)
- 28 NVMC November Meeting (subject to change based on show)

AFMS Code of Ethics

- I will respect both private and public property and will do no collecting on privately owned land without the owner's permission.
- I will keep informed on all laws, regulations of rules governing collecting on public lands and will observe them.
- I will to the best of my ability, ascertain the boundary lines of property on which I plan to collect.
- I will use no firearms or blasting material in collecting areas.
- I will cause no willful damage to property of any kind - fences, signs, and buildings.
- I will leave all gates as found.
- I will build fires in designated or safe places only and will be certain they are completely extinguished before leaving the area.
- I will discard no burning material - matches, cigarettes, etc.
- I will fill all excavation holes which may be dangerous to livestock. [Editor's Note/Observation: I would also include wildlife as well as livestock.]
- I will not contaminate wells, creeks or other water supply.
- I will cause no willful damage to collecting material and will take home only what I can reasonably use.
- I will practice conservation and undertake to utilize fully and well the materials I have collected and will recycle my surplus for the pleasure and benefit of others.
- I will support the rockhound project H.E.L.P. (Help Eliminate Litter Please) and Will leave all collecting areas devoid of litter, regardless of how found.

- I will cooperate with field trip leaders and those in designated authority in all collecting areas.
- I will report to my club or Federation officers, Bureau of Land management or other authorities, any deposit of petrified wood or other materials on public lands which should be protected for the enjoyment of future generations for public educational and scientific purposes.
- I will appreciate and protect our heritage of natural resources.
- I will observe the “Golden Rule”, will use “Good Outdoor Manners” and will at all times conduct myself in a manner which will add to the stature and Public “image” of rockhounds everywhere.

**MEMBERSHIP APPLICATION OR RENEWAL
THE MINERALOGICAL SOCIETY OF THE DISTRICT OF COLUMBIA (MSDC)**

Family ~ \$25.00 per year. One address.

Individual ~ \$20.00 per year.

New * Renewal Dues are for Year _____*

For new members who join in the last months of the year, membership will extend through the following year with no additional dues.

ANNUAL DUES – PLEASE PAY YOUR DUES PROMPTLY.

Pay at next meeting or mail to:
Mineralogical Society of DC
c/o John Weidner
7099 Game Lord Dr
Springfield, VA 22153-1312

Name(s) (First and Last) _____

Address _____

City _____ State _____ Zip: _____

Phone(s): Home/Work/Mobile _____

Email(s) _____

OK TO INCLUDE YOU ON CLUB MEMBERSHIP LIST?

Yes – Include name, address, phone, email.

If you want any information omitted from the membership list, please note:

Omit my: Email, Home phone, Work phone, Mobile phone, Address,
 Name

SPECIAL CLUB-RELATED INTERESTS? _____

**MINERALOGICAL SOCIETY OF THE DISTRICT OF COLUMBIA
(2015 Officers & Board Members)**

President: Dave Nanney, dnanney@cox.net

Vice President & Program Chair: Dave Hennessey

Secretary: Andy Thompson, thompson01@starpower.net

Treasurer: John Weidner, (mail: 7099 Game Lord Dr, Springfield, VA 22153-1312)

Directors:

Editor (Acting): S. Johnson, novaya2@cox.net

Co-Web Masters: Betty Thompson & Casper Voogt, <http://mineralogicalsocietyofdc.org/>

Meeting Dates, Time, and Location: The first Wednesday of each month. (No meeting in July and August.) The National Museum of Natural History, Smithsonian Institution, 10th Street and Constitution Ave, Washington D.C. We will gather at the Constitution Avenue entrance at 7:45 PM to meet our guard who will escort us to the Cathy Kirby Room. Street parking:

Parking is available in the Smithsonian Staff Parking – just tell the guard at the gate that you are attending the Mineral Club Meeting.



THE MINERAL MINUTES

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Newsletter of the Mineralogical Society of the District of Columbia

Mineralogical Society of DC

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