



*The Mineralogical Society of the
District of Columbia*



THE MINERAL MINUTES

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- January's Meeting is Wednesday, 3 January. We will be meeting at 7:45pm in the lobby of the Museum of Natural History. We will also be meeting prior to that for dinner (6pm) at the Elephant and Castle Restaurant (12th & Pennsylvania)
- A gentle reminder – if you haven't paid this year's dues, please John Weidner at the meeting.

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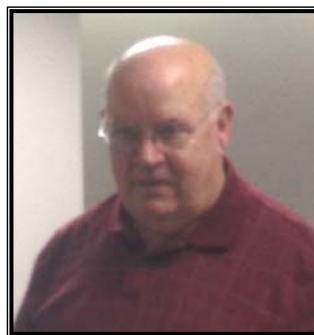
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Prez Says..

By David Nanney,
MSDC President

Happy New

Year. 2018 has come with a chilly brrreeze. Prof Callan Bentley reminds us this is weather, not climate and has tables of recorded temperatures to show our constant



rising temperatures. But today's weather is simply too COLD.

My first order of business is to celebrate our great gathering in December, 2017 celebrating our 75th Anniversary and MNCA's 50th Anniversary. IMHO, it was a complete success as we honored the long standing relationship with the Smithsonian Institute. We had 74 people attend, the room at the Holiday Inn was super, the speakers were outstanding, and it looked like everyone had a good time.

I tried poorly to thank those who helped make this a success, and missed

as many as I identified. So I'm going to duck and simply say this evening could not have happened without the support of many people stepping to cover needs as they surfaced in the weeks before the event. I'm going to take a minute at the meeting in January, with Dave Hennessey's help, to identify all the contributors. It also looks like this was a financial success as we appear to have broken even on the costs. WHEW!

January Program – What's a nesosilicate? Why should you care? Come to our May 4th meeting and find out. MINDAT Trip to the Kola Peninsula

By Casper Voogt



From August 24 – September 1, 2017, MINDAT organized an “adventure” to the Kola Peninsula, in the far northwest of Russia. Guided by local and international experts, a group of 40

Our talented web master, Casper Voogt, is going to start the New Year off by sharing one of his many mineral adventures. Casper is obviously an excellent IT professional, an avid mineral collector, and a world traveler. This talk will be another in the series of super presentations arranged by Dave Hennessey (VP). Join us at dinner before the meeting and get to know Casper better.

people visited some of the most exciting and remote mineral localities in the world. The Kola Peninsula is home to a huge number of rare mineral species, many of them found nowhere else on Earth.

One participant in this MINDAT adventure was Casper Voogt. This

month, Casper will present an overview of the adventure, which included visits to museums and private collections in addition to various Kola Peninsula localities – mines, dumps, and quarries in Apatity, Afrikanda, Kovdor, and Lovozero. There were opportunities for purchase and collecting for the participants. Casper will present a summary of the trip including mineralogical and other highlights and show us some of the specimens he

brought back.

Casper is a part-time mineral dealer, lifelong mineral collector, and avid traveler. His academic background is in architecture (Princeton and Georgia

Tech). He has lived in the US, the Netherlands, Aruba, and Switzerland. In 'real life' he runs a web development company and is the webmaster of the Northern Virginia Mineral Club and co-webmaster of our MSDC website.

Please join us in taking Casper to dinner on January 3rd before the club meeting. We will be meeting at 6:00 pm at Elephant & Castle Restaurant, 1201 Pennsylvania Ave, NW, Washington,

Minutes of the Business Meeting of 1 November and 9 December

Andy Thompson, Secretary

President Dave Nanney welcomed all attendees and called the meeting to order. Noting there was no Geology in the News, he identified one important correction to the prior month's Business Meeting Report, namely an incorrect address for the site of the 9 December 75th celebration. He gave the correct site as the Holiday Inn-Carlyle, 2460 Eisenhower Ave, Alexandria, VA. Maps of that site were made available. A motion was made to accept the October minutes as amended, seconded and approved.

John Weidner then gave the Treasurer's report which indicated the club's finances were stable, and that membership dues for 2018 (individual \$20; family \$25) should soon be submitted to him.

Other important information included that the Northern Virginia Mineral Club has its annual show at George Mason University on November 18 and 19. MSDC and MNCA will hold its anniversary celebration on December.

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 and head up to the Cathy Kerby Room for Casper's presentation. What's a nesosilicate? Why should you care? Come to our May 4th meeting and find out.

Invitations, explaining the diner options, cost and time will soon be sent to all interested parties. Dave stressed that this event is open to everyone.

It was also noted that traditionally, when the club members meet in December, that is when a previously circulated slate of club officers, proposed by the Nominating Committee, is voted into office.

With all club business matters having been addressed, Dave called for a motion to close the meeting which he received and was affirmed by all present. He then turned the meeting over to V.P. for programs, Dave Hennessey, to introduce the evening's presenter, Dr. Mike Wise.

The December meeting of MSDC celebrated its 75 years of continuous service promoting mineralogical education and supporting mineral collectors in the DC area and beyond. Traditionally the yearly December meeting includes the election of officers for the following year. But given the festive nature of the occasion, only one item was on the business meeting agenda, a proposal to reschedule the election for the 3rd of January 2018 meeting. All the current officers agreed to stay on for another year with one exception due to the

expiration of Leslie Nanney's three-year term as Director. Amanda has agreed to run for her position and her name has been added to the proposed slate of officers which will be voted on at the 3

November's Program: "Amethyst Deposits in the United States"

Presented by Dr. Mike Wise of
the Smithsonian
Andy Thompson, Secretary

Dave Hennessey introduced the evening's presenter with a good-natured teasing of Dr. Mike Wise by announcing that Mike graduated from the second best university in VA, namely UVA, in contrast to several MSDC members whose alma mater is the "preeminent" College of William and Mary. Once the commotion settled down, Mike identified his presentation's focus as "Amethyst Deposits in the United States," a topic he has been researching for the past 18 months. His work enabled him to give an historical overview of the mineral, the major sites for mining amethyst and the unique characteristics of specimens from those sites.

Amethyst, he noted, is perhaps the semiprecious gemstone most widely recognized by the public because it is the only violet or purple crystal and is found in considerable abundance, including in geodes. Historically, the name amethyst originated with the ancient Greek word for "not drunk" and reflected the legend that anyone wearing this jewelry or drinking from a cup made of it would not become inebriated.

Mike said that today many people mistakenly think of it as being its own mineral species, when, in fact, it is a

January meeting. Members voted unanimously to approve this postponement until January and voted to close the business meeting.



variety of quartz. One of its peculiar characteristics is that the purple color
Photo by Chip Clark.

saturation typically is not uniform throughout the crystal structure, but is often concentrated toward the terminated tip, and in patches or zones elsewhere in the body of the crystal.

The presence of these color zones raise the question of what chemical processes are at work to bring about this purple saturation. The answer, he noted, is due to iron impurities which replace a silicon atom within the quartz crystal structure. Iron can appear in any one of 3 forms, Fe^{+2} , Fe^{+3} and Fe^{+4} , as an impurity, within the matrix of quartz's silicon dioxide (SiO_2). When one of those three, the positively charged iron ion Fe^{+3} , loses an electron and becomes Fe^{+4} , that changes the color absorption of the quartz crystal matrix by shifting it toward the purple side of the spectrum. This change in the iron ion's valence is frequently caused by random gamma rays, natural radiation or artificial irradiation.

Occasionally an unscrupulous mineral dealer will deliberately expose white quartz to radiation or high temperature heat treatment resulting in color changes toward deeper purple or even



toward citrine orange and green. For the two latter colors, that is a clear indication for savvy collectors who know the non-purple colors are not natural for amethyst.

Photo by Chip Clark.

Mike noted that mineralogists have yet to solve a natural mystery of the thin line of white quartz typically found on the outermost interior edge of geodes. Given that the shift from white quartz to purple amethyst is typically caused by natural radiation coming from outside the geode, and given a geode is a naturally closed system, why then would that thin line of white quartz not be purple rather than white? Clearly, there is another or multiple factors contributing to this color shift phenomenon.

The best individual examples of thorough color saturation, he said, have been found in Siberia, often with touches of red. Internationally, the most abundant bulk sources of amethyst are found in Brazil, Uruguay and Bolivia,

with runner-up amounts being found in Russia and thirdly in Zambia.

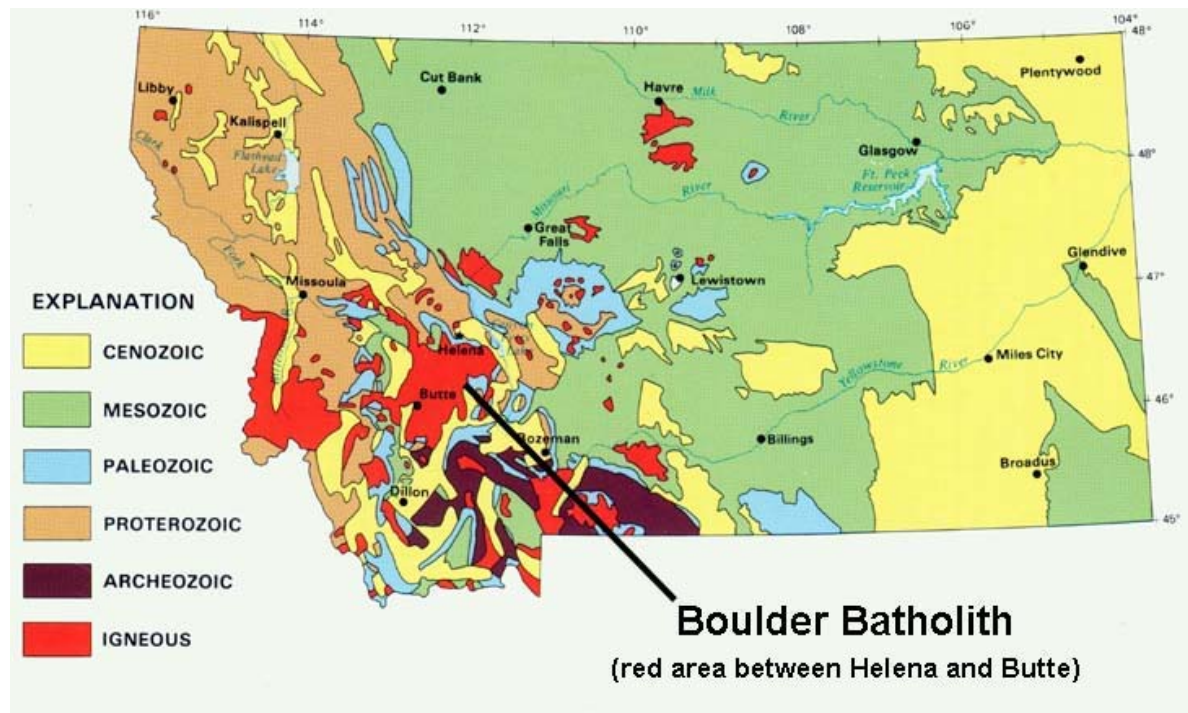
Having explained the general chemical process of the iron ion changes resulting in amethyst formation, Mike then raised the question of how amethyst is formed from a geological perspective. He pointed to hydrothermal deposits as the primary source and noted that amethyst crystals are rarely found in pegmatite deposits, i.e., deposits of large crystals created when intrusive igneous minerals cool very slowly below ground and mineral concentrations have time to become more diffuse throughout the deposit.

Beyond hydrothermal events generating amethyst, the secondary process for amethyst formation is associated with volcanic lava flows. Perhaps a prime example is the omnipresence of geodes, whether small round spheres or very large finger-like cathedral geodes. Both characteristically have an outer green rind, followed by the mysterious interior white quartz edge noted above, then darker tiny grey chalcedony crystals and finally the purple amethyst lining the bulk of the cavity.

With that overview established, Mike then turned to the presentation's main theme of where amethyst is found in the United States. From his descriptions, often rooted in first-hand visits to the sites, it was clear that each of the individual mines has its own unique history and crystal characteristics. The Four Peaks Amethyst Mine in Arizona, for example, is only 46 miles outside Phoenix, but because of the surrounding very rough terrain it is the only U.S. mine requiring a helicopter ride to gain access to it. Historically, Mike said, it

was the first mine yielding very high-quality crystals (Siberian Red) and was opened a century ago although with

these and all the above-mentioned mines, Mike showed representative pictures of the specimens. In contrast, in



very limited access. Again, due to its rough setting, all mining of that site is done by hand rather than using bulky commercial equipment. Map provided by Montana Earth Science Picture of the Week

The best practical site for mining amethyst, he said, was Boulder Batholith in southwest Montana, in a mountain range located between Butte and Helena. This mine, like most, has its own characteristic chemical signature. Here the amethyst is found associated with smoky quartz and microcline feldspar. The crystals frequently have an “alligator” rough surface and often are doubly terminated.

On the other side of the U.S., Mike spoke of several amethyst mines, starting with the Deer Hill area in Maine, northwest of Portland near the White Mountain National Forest. It is home to multiple amethyst mines. For each of

the trap rock of New Jersey, amethysts seem associated with ancient lava flows and hydrothermal deposits which include stilbite and amethyst pseudomorphs.

He noted that farther south in the Piedmont, ranging along a relatively narrow strip from New Jersey to Alabama, there were three distinct geological settings. Although there were differences in the chemistry of the individual mines, there were also commonalities. In the Reel Mine in North Carolina, for example, similar to the NJ mining sites, there was geological evidence of earlier hydrothermal activity. So this raises the question: Do all of these sites share a similar process for their geological formation? In particular, in the mines of NC, SC and GA, many have beds of small milky quartz associated with larger amethyst crystals. Mike asked: Why is that? In the hiddenite mines of NC,

where ever emeralds are found, amethyst is absent. Where hiddenite is found and amethyst is present, the latter crystals take the shape of pale purple scepters and are found with clear quartz usually in small cavities located in 4 inch wide veins.

So for Mike the big question is whether or not there is a common formation process for most of these amethyst deposits. Does it have something to do with rifting between the North American and African plates? He concluded that there are plenty of puzzles and geological dots yet to be connected by researchers.

November Meeting's Show and Tell

Several MSDC members brought in interesting minerals and related materials. Angelo Cicolani brought in a small piece of pottery on which he painted a glaze using the mineral Willemite, a zink oxide, which, when baked at 2300 F degrees, produced a

EFMLS – AFMS Annual Convention! Raleigh, North Carolina

Friday, April 6 – Sunday, April 8

Field trip - Monday, April 9

Hosted by the Tar Heel Gem & Mineral Club

The Tar Heel Club is planning an interesting and fun weekend in a beautiful part of the country. The host hotel for the convention is

The Embassy Suites by Hilton, Raleigh Crabtree

A question and answer session followed which established that Mike has not seen much evidence of twinning in amethysts. Several attendees asked questions about specific amethyst mineral specimens which Mike helped clarify.

With applause, all signaled their appreciation for Mike's highly informative and thought-provoking presentation.

(For additional pictures of amethysts and other minerals, Dr. Mike Wise refers readers of this synopsis to visit the Smithsonian Mineral Department's website: <http://mineralsciences.si.edu/>)

beautiful light green finish. Dan brought in and gave away many mineral specimens he collected from the same copper mining area which colonialist Paul Revere used to obtain his raw metals. Ken brought in several minerals, some fluorescent, which he activated with a small Convoy UV LED flashlight he said he bought for \$20 (see www.gearbest.com).

4700 Creedmoor Rd, Raleigh, NC 27612

Phone: (919) 881-0000

A block of rooms has been set aside, but you must call the hotel directly to make room reservations. Let the reservations clerk know that you are with the EFMLS Convention to obtain the group rate. This rate is good for Wednesday, April 4 through Monday, April 9.

Schedule of Events:

Thursday, April 5:

- 9:00 am - AFMS Uniform Rules Meeting

- 10:30 am - AFMS Annual Meeting followed by the AFMS Scholarship Foundation meeting.
 - 3:00 pm - ALAA annual meeting
 - 6:30 – 8:30 pm -
 - AFMS Cracker Barrel
- Friday, April 6:
- Tar Heel Gem & Mineral Club Show
 - Noon - Buffet Lunch at hotel restaurant (fee)
 - 2:30 pm - Field trip to a local museum (tentative)
 - 7:00 pm - EFMLS Annual Meeting
- Saturday, April 7
- Tar Heel Gem & Mineral Club Show

- 6:00 pm - Awards banquet social hour with cash bar
 - 7:00 pm - Awards Banquet with EFMLS Auction
- Sunday, April 8
- Tar Heel Gem & Mineral Club Show
 - 8:30 am - Breakfast with the Editors and Webmasters.
- Monday, April 9
- Field trip to Hiddenite, NC. Fee \$20 per person

Hopefully registration forms will be on the EFMLS and AFMS website soon. Please check there often.

“75 Years and Counting!!”











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 November and December 2017 issues of the *American Mineralogist: Journal of Earth and Planetary Materials*.
<http://www.minsocam.org>

Rutile is the Key

On page 2153 of this issue, Alicia Cruz-Urbe provides an overview of Guo et al. (2017; p. 2268 of this issue), who investigate rutile grains that form at the rims of Fe-Ti oxides in greenschist facies metamorphic rocks. Associated mineral and inferred reactions indicate that rutile forms by the action of highly oxidized fluids, approaching nearly 4 log units above QFM, during retrograde metamorphism. As Cruz-Urbe notes, this study illustrates a how rutile may be a record of elevated fO_2 fluids at subduction zones. The possibility is that rutile is forming as the rocks intercept high fO_2 fluids that are driven off the slab, or are otherwise connected in some way to subduction zone magmatism. These rutile grains, though, would not be responsible for the high field strength element signatures of arc magmas.

Volcanoes & Plutons: disconnected

On page 2154 of this issue, Calvin Miller reviews the granite controversy of the prior century, and new questions that have evolved since. The context involves new findings by Tang et al. (2017; p. 2190 of this issue) who use

zircon compositions from volcanic and intrusive felsic rocks from Hong Kong, to test ideas of volcano-plutonic connections. Their work indicates that at least at Hong Kong, plutons are not the residues of felsic eruptions. Instead, felsic volcanic chambers are nearly completely evacuated, and intrusive rocks are evolutionary analogs intruded when conditions for eruption were unfavorable. Though closely related in space and time, the felsic rocks of this region are not co-magmatic, but generated independently and erupted, or not, as structural conditions allow.

No Fe-Ti Oxide Magmas

On page 2157 of this issue, Lindsley and Epler present new experimental data to re-examine the genesis of massive Fe-Ti oxide bodies that occur mainly in association with anorthosites, often as dikes. At issue is whether such oxide-rich bodies are crystalline residues of a silicate melt, or were melts in and of themselves, possibly formed along an oxide-silicate melt solvus (as an immiscible melt). These authors conclude that such oxide bodies have bulk compositions that cannot occur as melts at geologically reasonable temperatures. More likely the oxide-rich

bodies were intruded as crystal-rich mushes, perhaps lubricated by small amounts of a silicate melt. They also imply that some "jotunite"-like rocks (having low Si and high Fe and Ti) are these very same lubricating silicate melts, apparently acquiring their low Si and high Fe and Ti by dissolving some of their otherwise mechanically associated Fe-Ti oxides.

Orthophosphates: What can't they do?

On page 2170 of this issue, Robert Heimann reviews a class of orthophosphates with NASICON structure, which nicely illustrate how fundamental concepts of mineralogy are pivotal in the search for superior bioceramics used in a variety of medical applications. Heimann proposes that Ca(Ti,Zr) hexaorthophosphates have bone growth-mediating characteristics that are particularly well suited for use as coatings on metallic implants (in knee or hip replacements) so as to aid bio-integration of the foreign materials, and, based on the solid-state ionic conductivity of these compounds, proposes a new device that is expected to electrically stimulate bone growth. While the biological uses are emphasized, the author suggests that these same structures should also be useful for storage of radioactive waste or as electrodes in molten Na-ion batteries, among other applications.

Fables of the Reconstruction (of Liquids Using Amphibole)

On page 2254 of this issue, Shimizu et al. develop parameterized lattice-strain models predictive of the partitioning of REE into amphibole. They find that REE partition coefficients are highly sensitive to the amphibole major element compositions--with order of magnitude variations accompanying arc magma genesis. Their new mineral-composition model allows one to reconstruct equilibrium liquid REE concentrations from amphibole compositions alone, provided that temperature is known, and a new thermometer is presented as well. Application of these new models reveals a greater role for amphibole fractionation of arc magmas, relative to clinopyroxene, and that REE-rich amphiboles are likely records of particularly low-T amphibole crystallization.

Fast Moving Dunites (from 150 km)

On page 2295 of this issue, Su et al. describe magnesite + aragonite intergrowths within the Sulu UHP terrane of eastern China, that form as breakdown products of dolomite, at >5 GPa. The authors infer that the precursor dolomite formed from a metasomatic melt, perhaps within the uppermost part of the mantle. In any case, because the breakdown reaction of dolomite is not sensitive to T, it seems that the carbonates were indeed formed at very high pressure, and the lack a retrograde reaction of magnesite + aragonite back to dolomite further indicates that the exhumation was rapid

or dry or both. The authors infer that other dunitites may harbor the very same clues of a UHP history, if similar textures and assemblages may be found.

Useful Mineral Links:



Eastern Federation
of Mineralogical
and Lapidary
Societies (EFMLS)

www.amfed.org/efmls



American
Federation of
Mineralogical
Societies (AFMS)

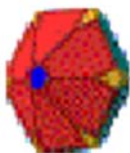
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www.minsocam.org

**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) _____

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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: c/o MSDC, P.O. Box 9957, Alexandria, VA 22304)

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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