

# Mineralogical Society of the District of Columbia



## *MINERAL MINUTES*

*The Mineral Minutes is the bulletin of The Mineralogical Society of the District of Columbia, Inc.*

*The purpose of this Society is to promote interest in mineralogy, geology, and related earth sciences and to encourage mineral collecting. An annual scholarship is awarded to a deserving student in the related field.*

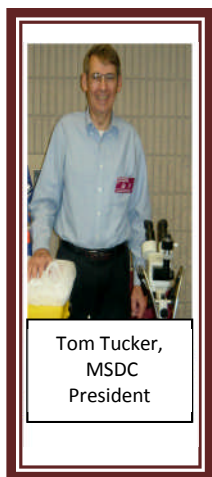
*The Mineralogical Society of the District of Columbia is one of the founding Societies of the Eastern Federation of Mineralogical and Lapidary Societies.*

**Vol. 71, No. 4**

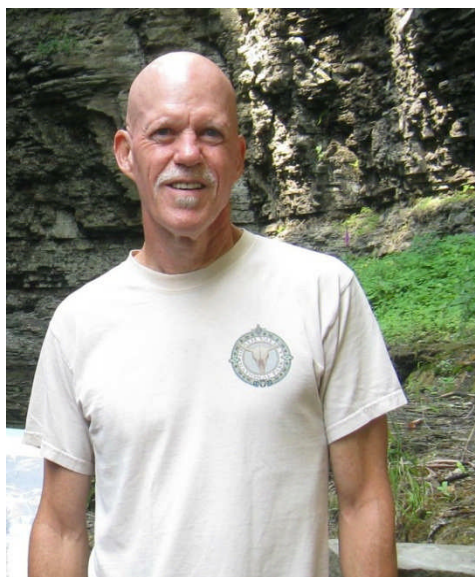
**Founded 1942**

**April 2012**

**Program and Speaker: April 4, 2012 - Program Title:  
"Bowen's Reaction Series."**



Tom Tucker,  
MSDC  
President



(photo credit: <http://www.nvcc.edu/home/jmarx/>)

*Joe Marx, Adjunct Professor of Geology; Science, Technology  
& Business Division, Northern Virginia Community College.*

**Bowen's reaction series** is the work of the petrologist, Norman L. Bowen who explained why certain types of minerals are generally found together while others are rarely found together.

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April 2012



**The Prez Says...**

A Word from MSDC, President, Tom Tucker

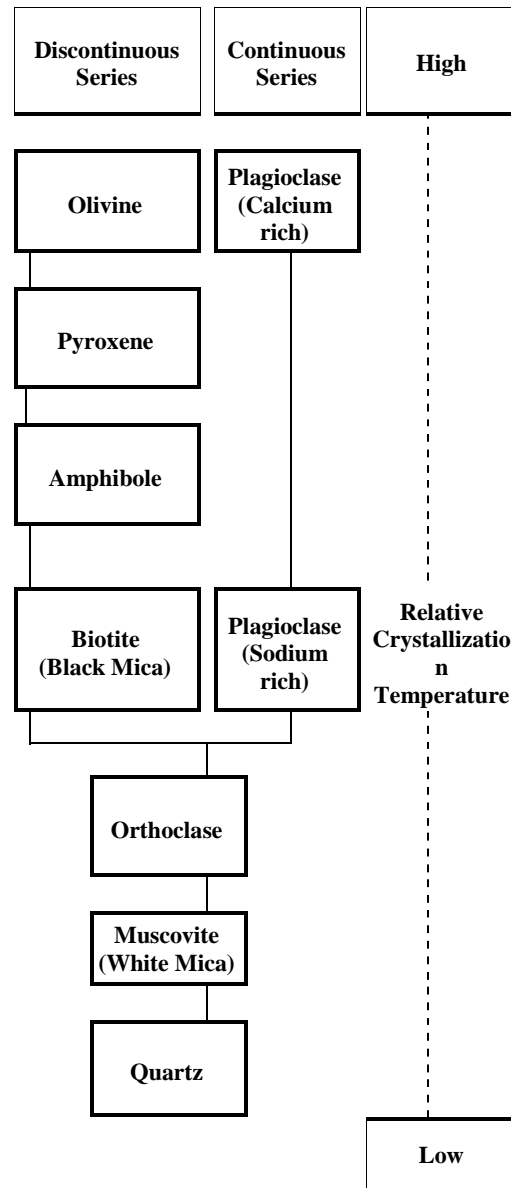
**1909 Lincoln cent, geology on Mars, and the Pfennig**

Yesterday I was at the local public library, and happened to catch a glimpse of one of the coin collector's magazines - Coin World. The lead article on the front page is: 1909 Lincoln, V.D.B. cent en route to Mars. What has that got to do with our interest in geology and minerals?

My first thought was, "what a sad waste of a nice old collectible coin;"—one from the very first year of production of the Lincoln series of cents, or "pennies" as we know them. It turns out, however, that they are using the cent coin just as every geologist has done before them—as a target scale for photography that will be done by the "Martian Hand Lens Imager," or MAHLI, on the new rover Curiosity, as it explores the Red Planet. We've all taken pictures of rocks or outcrops or wildflowers or whatever, and placed alongside a handy coin from our pocket, to "scale" the picture—to give us some idea of how large our picture subjects are. Likewise, the "geologist" on this new planetary probe will use a common penny as one of the scales for the marvelous photographs that will be streamed back to us soon after they are taken. It is said that we will be able to discern details as "fine as a human hair" on photographs soon posted on an appropriate website.

That's all well and good, but couldn't they have used a modern penny—the ones with the ugly shield on the back, and composed of metals guaranteed to alter and corrode in short order—thus leaving this century old specimen for someone to treasure in their collection. As it turns out, the selection of this old specimen was well thought out—and, no, a modern penny wouldn't have been suitable. You'll have to read the entire article to learn why, on the cover page of "Coin World," dated February 27, 2012.

April 2012



“The series is broken into two branches, the continuous and the discontinuous. The branch on the right is the continuous. The minerals at the top of the illustration (given above) are first to crystallize and so the temperature gradient can be read to be from high to low with the high temperature minerals being on the top and the low temperature ones on the bottom. Since the surface of the Earth is a low temperature environment compared to the zones of rock formation, the chart also easily shows the stability of minerals with the ones at bottom being most stable and the ones at top being quickest to weather, known as the

Goldich dissolution series. The high temperature minerals, the first ones to crystallize in a mass of magma, are most unstable at the Earth's surface and quickest to weather because the surface is most different from the conditions under which they were created. The low temperature minerals are much more stable because the conditions at the surface are much more similar to the conditions under which they formed.” (chart, write-up, and photo from: [http://en.wikipedia.org/wiki/Bowen%27s\\_reaction\\_series](http://en.wikipedia.org/wiki/Bowen%27s_reaction_series)).

**MSDC Meeting Minutes - March 2012**



**Secretary, Pat Rehill**

- Meeting Date:** March 7, 2012
- Meeting Place:** Katherine Kerby Room, Smithsonian Institution National Museum of Natural History
- Minutes Approved:
- Agenda:** Club Vice President Andy Thompson, presiding. Recognized past presidents: Cynthia Payne, Ed & Susan Fisher.
- Minutes Approved:** February 2012
- Attendance:** 24 members including 3 guests
- Treasurer's Report:** Rick Reiber was not present.
- Old Business:** None

**The Prez Says...(cont.)**

In a similar situation, I was exploring the geology west of Winchester, Virginia about 15 years ago, following a published road log to various outcrops. I came upon a nice exposure of shaley limestone—thin beds of limestone an inch or so thick, interbedded with abundant mucky wet shale. The limestone contains a gazillion small fossils—mostly brachiopods - that are well exposed for all to see. Sitting right there amongst all those little fossils was a German 1-pfennig coin—very much like our penny, but it spoke German. It was obviously perched there to be used as a "scale" for someone's photograph. However, a German pfennig, in Virginia? It turns out that the International Geologic Congress had been held in Washington in July, 1989. That was shortly before I found this little treasure from afar. I suppose that a visiting geologist from Germany, on perhaps a sponsored field trip at the Congress, had used the little brown coin as a scale for his, or her, photographs of these well-displayed fossils—*just like they are going to do on Mars.*

- New Business:** Upcoming Events – Speaker, Joe Marks will discuss the Bowen Cycle and how minerals evolve. Johnny Johnson will present on “Prolite,” the most ugly but prolific mineral.
- Raffle Winners:** Kathy Hrechka and Cort McElroy.
- Mineral Show Reminder:** March 17-18 is the Gem, Lapidary and Mineral Society of Montgomery’s mineral show.

**Close of Business Meeting: 8:12 pm**

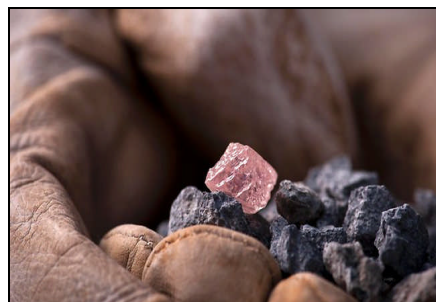
**Program:** Our speaker was Alan Cutler, Ph.D, (Professor Montgomery College, Maryland).

**Author- *The Sea Shell on the Mountaintop, Nicolas Steno, Father of Geology, 1638 Copenhagen.* See also, Andy Thompson’s article Vol. 65. No 08 Mineral Minutes October 2006, pg. 4 &5.**

**Topic:** Alan Cutler decided to write his book about Nicolas Steno, while doing his Post Doctorate at the Smithsonian. Premise: “From where do fossil shells on top of a mountain, emanate?” Solving this question served as a fundamental role for early scientists in ancient Greece. The fossils found in stone puzzled the Greeks.

The meeting concluded at 9:15 pm with refreshments provided by Betty Thompson, Susan Fisher, and other members.

**IN THE NEWS – IN THE PINK!**



<http://www.forbes.com/sites/anthonydemarco/2012/02/21/rare-12-carat-argyle-pink-diamond-uneearthed-in-australia/>  
By Sheryl E. Sims

The Argyle **Pink** Jubilee is reportedly a 12.76 carat diamond. It was found at the Argyle diamond mine in East Kimberley, Western Australia, and is the largest **pink** diamond ever to have been found at the Australian mine. More than 90 percent of **pink** diamonds come from the Argyle mine.

## **Dating the Old and the Very Old—**

### **It's All a Matter of Isotopes**

*By Jenny Smith  
(Former MSDC Member)*

Have you wondered how ancient artifacts and very old rocks are dated with accuracy? Well, it is all a matter of some very special isotopes.

We are familiar with carbon-14 dating and know that it can only date bones, wood and plant fiber, all items that were once alive and members of our carbon based life forms. Carbon-14 is an isotope of carbon.

To explain: Atoms are the building blocks of all matter. "These tiny atoms contain even smaller particles called protons and neutrons which are located in the center of the atom, forming its nucleus. Elements are fundamental substances such as iron, carbon and oxygen. The identity of these elements is determined. By the number of protons in the nucleus of its atoms, and is called its atomic number. An elements atomic weight is the sum of the protons and neutrons in its atoms.

Atoms of the same element may have different atomic weights, and these differing atoms are called isotopes. Carbon has two stable isotopes, carbon 12 and 13. Carbon-14 is radioactive and has a relatively short half-life of 5730 years, meaning that the amount of carbon in a sample is halved over the course of 5730 years due to radioactive decay. Carbon disintegrates at a fixed rate into an isotope of nitrogen, so the amount of carbon-14 in a sample will reveal its age—but only up to 5730 years.

To date the ancient rocks that have determined our geologic ages, carbon-14 will not do the job. Instead, an isotope of uranium, uranium 238, accurately measures the ages of our very oldest rocks, with small margins of error.

This is accomplished by radio metric dating which is based on known rates of atomic decay, which is a spontaneous energy emitting process in which radio-active elements and their isotopes are transformed at a precise rate into new elements and isotopes. The decay rate is expressed as half- life. Most isotopes have a short half- life of just several years or even just several days. The longest known half- life is a remarkable *4.4 billion years*, and it belongs to uranium 238.

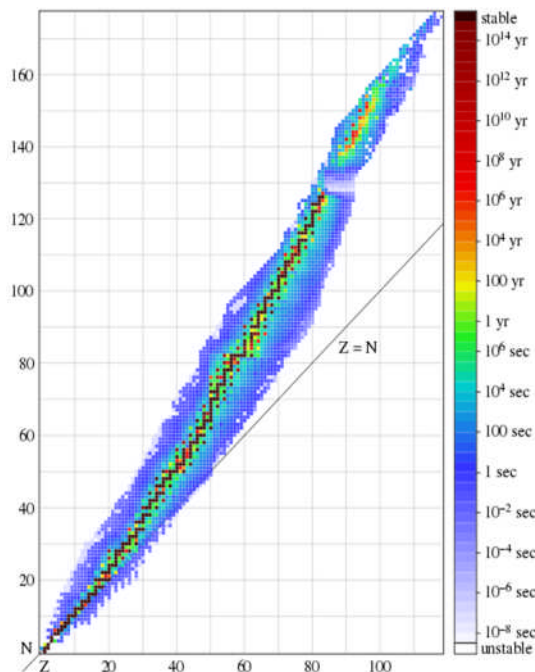
In order for uranium 238 to be valuable to us it must be trapped within a mineral that can survive a long period of weathering. Zircon crystals have great durability and because of zirconium's great affinity to uranium, they almost always contain traces of uranium 238. Because zircon is relatively abundant, widely distributed and durable enough to survive billions of years, it is an extraordinary tool for dating very old rocks.

There are other isotopes of value to us. In 1948 an expedition from the University of California found a part of a fossil ape jaw. The fossil was found lying between deposits of volcanic dust that have since been dated by the Potassium – argon method which measures the radio- active decay (half- life) of an unstable isotope of potassium as it changes at a known and regular rate into inert argon gas. It placed the jaw to be between 27.5 and 24.8 million years old. It is true, the dating of the old and the very old is just a matter isotopes!

***SAVE THE DATE!***

***See our upcoming events.***

***INVITE A FRIEND TO OUR MEETINGS!***



Isotope half-lives. Note that the plot for stable isotopes diverges from the line, protons  $Z =$  neutrons  $N$  as the element number  $Z$  becomes larger (image credit and definition: <http://en.wikipedia.org/wiki/Isotope>)

Isotopes are variants of atoms of a particular chemical element, which have differing numbers of neutrons. Atoms of a particular element by definition must contain the same number of protons but may have a distinct number of neutrons which differs from atom to atom, without changing the designation of the atom as a particular element. The number of nucleons (protons and neutrons) in the nucleus, known as the mass number, is not the same for two isotopes of any element. For example, carbon-12, carbon-13 and carbon-14 are three isotopes of the element carbon with mass numbers 12, 13 and 14 respectively. The atomic number of carbon is 6 (every carbon atom has 6 protons); therefore the neutron numbers in these isotopes are 6, 7 and 8 respectively.

**Treasurer’s Note:**



Treasurer, Rick Reiber

**Reminder: DUES!**  
 “Now” is always a good time to pay your dues! (MSDC 2012 dues was due on January 1, 2012.) \$20 for single memberships. \$25 for family memberships. Invite your friends and family to join!

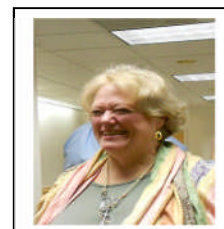
**STOLEN AT TUCSON!**  
 (publication of the World Gem Society 9.February.2012)  
**A REWARD is offered by**  
**The World Gem Society**

The World Gem Society office has been informed that the good folks from the Sunstone Butte Mine of Plush, Oregon had their entire inventory stolen from a trailer at the Tucson Gem Shows earlier this week. This theft has taken away years of very hard work on the part of these folks, and we are asking the assistance of the world gemstone industry to help us get it back.

**The World Gem Society is offering a US\$1,000.00 REWARD** for information that leads to the return of these goods to the mine owners. Please refer all leads to the **Tucson Police Department at 520-791-4444. LAW ENFORCEMENT OFFICES:** The World Gem Society has "in situ" gathered specimens from the Sunstone Butte Mine and can identify recovered gemstones from this mine by XRF, SEMS, and LA-ICP-MS elemental analysis.

**WELCOME!** Judy Dixon was welcomed by MSDC members. Guests are always welcome to attend MSDC meetings. Please invite your friends!

**ENJOY REFRESHMENTS?** Please sign-up with Betty Thompson to bring refreshments to our monthly meetings if you can. Many thanks! We appreciate your contribution!



(photo by Cynthia Payne)

**Minerals in the News (Part 2)**

*By Erich Grundel*

**Olivine (Forsterite, Peridot, Mg<sub>2</sub>SiO<sub>4</sub> or magnesium silicate)**

Olivine is a relatively abundant mineral at the surface of the Earth though it is usually formed at depth. Good crystals have occasionally been found at the Parker Mine, Quebec, Canada and St. John's Island, Egypt. "Apache Tears" are also an example of the mineral. The green sand beaches of Hawaii are made of olivine.

NASA's Spitzer Space Telescope recently discovered a forming star where it is "raining" olivine. A report (Poteet, 2011) about the protostar HOPS-68 in the Orion constellation gives an explanation of how this is happening. The olivine crystals need a temperature as hot as lava to form. Once formed at the surface of the emerging star they are carried by gas jets into the surrounding cooler cloud of gas where the crystals ultimately fall back down again in what must be a sparkling green rain.

**Diamond (C or carbon)**

Diamonds occupy a unique place in mineralogy. Their economic value alone makes them the most expensive of all minerals. They have a scientific value matched by no other mineral. Because they are formed at great depth, are impervious to mechanical and chemical alteration to the point they are nearly indestructible and were formed in very old rocks, they offer an unparalleled window into processes beyond our view and into times far removed.

What makes diamonds such valuable tools are their inclusions. Protected by their resistant envelope the inclusions have yielded a time line to

the central process of the geology of the Earth's surface. A compilation (Shirey, 2011) of more than 4,000 reports on silicate and sulfide inclusions that covers 3.5 billion years (3.5Ga) of Earth's history has pinpointed the start of the Wilson Cycle or more commonly referred to as plate tectonics

The inclusions in the diamonds formed in the lithospheric mantle keels of stable continental crusts known as cratons, which still exist and are accessible. The diamonds stayed at these depths of around 100 miles (lithospheric upper mantle) for billions of years until they were transported near the surface of the cratons by kimberlite volcanism during the last few hundred million years. Prior to 3.2 Ga

peridotitic (see previous entry) inclusion composition prevailed. After about 3.0 Ga eclogitic inclusion composition dominates. Peridotitic rocks and their minerals are those derived from the upper mantle while eclogitic rocks and their minerals are thought to be derived from the recycling of oceanic crust by subduction of tectonic plates. Therefore it is interpreted that around 3.0 Ga the Earth's surface configuration went from passive to mobile or the Wilson Cycle was initiated.

Another paper (Silversmit, 2011) looked at inclusions in ultradeep diamonds. In recent

years it has been discovered that there is a class of diamonds that are formed at much greater depths than others. The ultradeep diamonds are believed to form at depths of 250-400 miles. This is the region of the asthenospheric upper mantle and the lower mantle. Such diamonds are found in only a few places (*e.g.* Junia, Brazil; Kankan, Guinea; Jagersfontein, South Africa).

The uncertainty in studying inclusions is to be able to distinguish between those that were incased at the time of the diamonds formation and those that were formed afterwards. Those that formed afterwards most likely did so due to



<http://en.wikipedia.org/wiki/Olivine>

imperfections in the diamond that allowed other factors, such as fluids, to enter the crystal.

A unique mineral inclusion in the ultradeep diamonds is ferropericlase, (Mg,Fe)O. In the diamond studied in this paper there also were hematite (Fe<sub>2</sub>O<sub>3</sub>) inclusions. The inclusions were aligned along a plane, which probably represents a growth zone. Using x-ray techniques they were able to develop a 3-D distribution of the inclusions as well as oxidation states of the elements in the mineral. The results, along with information about the shapes of the inclusions, indicate that the hematite formed after the diamond crystallized, while the ferropericlase formed along with the diamond.

**REFERENCES:**

Guilbaud, Romain et al, *Abiotic Pyrite Formation Produces a Large Fe Isotope Fractionation*, **Science**, V. 332 (6037), p. 1548, 2011.

Lowrey, Anthony R. and Pérez-Gussinyé, Marta, *The role of quartz in controlling Cordilleran deformation*, **Nature**, V. 471 (7338), p. 353, 2011. Poteet, Charles et al, *A Spitzer Infrared Spectroscopic detection of Crystalline Silicates in a Protostellar Envelope*, **The Astrophysical Journal**, V.733 (2), L32, 2011.

Shirey, Steven B. and Richardson, Stephen H., *Start of the Wilson Cycle at 3 Ga Shown by Diamonds from*

*Subcontinental Mantle*, **Science**, V. 333 (6041), p.434, 2011.

Silversmit, Geert et al, *Three-Dimensional Fe Speciation of an Inclusion Cloud within an Ultradeep Diamond by Confocal  $\mu$ -X-Ray Absorption Near Edge Structure: Evidence for Late Stage Overprint*, **Analytical Chemistry**, V.83(16) p.6294, 2011

Stephens, Christopher J. et al, *Early Stages of Crystallization of Calcium carbonate Revealed in Picoliter Droplets*, **Journal of the American Chemical Society**, V. 133 (14), p. 5210, 2011.



**AFMS & EFMLS NEWS TO KEEP IN MIND**

(excerpts & photos from EFMLS & AFMS 2012 Newsletters).



**EFMLS Nominations**

**Matt Charsky, Nominating Committee Chair**

Matt Charsky is reminding members that it's not too early to begin thinking about candidates for the term 2012-13. Please contact him if you'd like to nominate someone for the positions of

EFMLS president, 1st or 2nd vice president, secretary, treasurer, assistant treasurer or editor. Please include the name of their club why you think they should be nominated. (Charsky.Matthew@epa.gov)

*Matt Charsky has been elected to the position of AFMS 2<sup>nd</sup> VP. He will officially begin serving his term at the Midwest Federation's AFMS conference, which will be held in Minnetonka, MN on July 26-29.*

**Congratulations Matt!**

*Visit [www.efmls.com](http://www.efmls.com) and [www.afms.com](http://www.afms.com) for more information on federation news and activities.*



**What YOU Can Do!**

**AFMS Scholarship Foundation News**  
**Reivan Zeleznik, AFMS Scholarship**  
**Foundation Coordinator**

The AFMS Scholarship Fund is an anonymous plan of giving to a yet-to-be-determined scholarship recipient. The acknowledgment of contributions will continue with the recognition of donations by clubs and their members. Certificates will continue to be granted as visible incentives to encourage donations from members and club budgets.  
(rzlapidary@yahoo.com)

**Each One Teach One (EFMLS)**

**Hazel Remaley, EOTO Chair**



Please help Hazel Remaley recognize deserving club member! Do you know club members who are teachers, instructors, writers, movers and shakers in your club? If so nominate them for the "Each One Teach One" award. Nominations should be sent to me by June 15<sup>th</sup> at: northridge5@verizon.net. Please do it TODAY!



**American Club Rockhound of the Year**  
**Ellery Borow, ACROY Chair**

Know some outstanding members? Nominate them your club's Rockhound of the Year! Once you send your selection to us we will publish the names and deeds of those members for all to see and appreciate. (Ellery Borow: 207-547-3154)



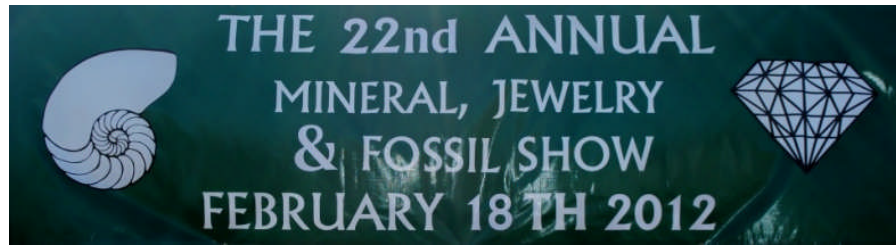
**Editor's Note:**  
**Newsletter Editor, Sheryl Sims**

**Thank you** for your submissions! Our club members are always anxious to read more from you! Please keep your submissions coming! You may email them to me at: **sesims4@cox.net**. Remember, it's your submissions that make our club newsletter a great read! **The *Mineral Minutes* newsletter deadline is the 15th of each month, but I always appreciate receiving submissions even sooner!**

**KNOW YOUR EFMLS OFFICERS**

**R. J. Harris, 1st Vice President, roqfreq@rjharris.com**  
**Cheryl Neary, 2nd Vice President, ciervo.neary@gmail.com**  
**Hazel Remaley, 2nd Vice President, northridge5@verizon.net**  
**Gerry Cox, Secretary, gerryannec@verizon.net**  
**Lou Budell, Treasurer, labudell@windstream.net**  
**Michael Patterson, Assistant Treasurer, Michael.Patterson@pgparks.com**  
**Carolyn Weinberger, Editor, PO Box 302, Glyndon, MD 21071-0302, 410-833-7926, cscrystals2@verizon.net**





(photos by Sheryl Sims)

***MSDC Members & Guests Attended the SMRMC Mineral Show***



**Upcoming Events:**

**March 17-18:** The Gem, Lapidary and Mineral Society of Montgomery County, 48<sup>th</sup> Annual GLMSMC Gem, Mineral and Fossil Show. Saturday 10am-6pm, Sunday 11am-5pm. Montgomery Co. Fairgrounds, 16 Chestnut St., Gaithersburg, MD. <http://www.glmsmc.com/show.html>

**March 24-25:** Sayre, PA – The 43<sup>rd</sup> Annual Che-Hanna Rock & Mineral Club Rock & Mineral club show will be held on March 24 (9-5) and March 25 (10-5) at the Athens Twp. Vol. Fire Hall, 211 Herrick Ave., Sayre, PA. Admission is \$3/adults, \$1/students, kids under 8 years old are free.

Contact Bob McGuire 570-928-9238 for more info.  
[www.chehannarocks.com](http://www.chehannarocks.com)

**April 4: MSDC Meeting Program: Professor Joe Marx will present "Details on Some New Kimberlite Pipes Found in Falls Church. Joe is a geology professor at Northern Virginia Community College. For further information, see <http://www.nvcc.edu/home/jmarx>**

**April 10 – 15:** EFMLS Workshops at Wildacres World renowned photographer Jeff Scovill will be the key-note speaker. Tuition for the April session is \$350 per. Additional cost for materials. [www.amfed.org/efmls](http://www.amfed.org/efmls)

**KEEP US INFORMED!** *Do you have news, a book review, or mineral information to share? Please share your news at our monthly meetings or by submitting it to the Mineral Minutes editor at [sesims4@cox.net](mailto:sesims4@cox.net).*

**"A Grain of Sand,"** by Dr. Gary Greenberg is a beautiful book highlighting Dr. Greenberg's micro-photography. With a Ph. D in biomedical research, Greenberg used a 3-D microscope to view the minerals found from beaches all over the world. The photos are AMAZING! On the surface, and, with the naked eye, beach sand looks bland. However, what Greenberg's research revealed with the use of his 3-E microscope, are gemlike minerals—bits of coral, magnetite, garnet, amber, quartz, mica, feldspar, etc. The colors, shapes, and intricate designs shown in such tiny grains of sand are breathtaking! (ISBN 978-0-7603-3198-9)  
—Sheryl Sims

**2012 Speaker Flash Back!**

- January 2012: Dr. Cari Corrigan gave a wonderful presentation on Meteorites in Antarctica
- February 2012: MSDC President, Tom Tucker, gave an informative presentation on his mineral travels in Vietnam.
- March 2012: Alan Cutler, (Author and geology professor at Montgomery College) spoke on the geological and mineralogical vision of Nicholas Alan Cutler Steno (1638-1686).

**JMU FIELD TRIP PICTURES**

(Photos by Cynthia Payne)



## LOOK WHO VISITED THE DELAWARE MINERALOGICAL SOCIETY'S MINERAL SHOW!

*By Sheryl E. Sims  
(DMS mineral show photos by author)*



Leslie and Dave Nanney



Cynthia Payne and Susan Fisher



Carolyn Weinberger, Sheryl Sims, and Steve Weinberger



Dave Nanney, Mark Dahlman, and Ed Fisher



Lunch Time!



Matt Charsky

“Would you like to go with us to the Delaware Mineral Show?” asked Leslie Nanney. “Yes!” I responded enthusiastically, and, go I did! Joining Dave and Leslie proved to be a day filled with fun, laughter, and really nice minerals. **The 49<sup>th</sup> Annual Earth Science Gem & Mineral Show** was sponsored by the Delaware Mineralogical Society and was held at the Delaware Technical & Community College on March 3-4, in Newark (Stanton), Delaware. Ed and Susan Fisher, along with Cynthia Payne, met us there. After some serious mineral shopping, we enjoyed a delicious lunch at a nearby restaurant.

While perusing the show, I bumped into, and started chatting with, a woman about some minerals that we spotted on a table. During the conversation, I glanced down and noticed her name tag. As it turned out, I had just bumped into Carolyn Weinberger, one of our EFMLS officers and editor! What a delightful surprise! I also met her husband, Steve, and a few other people who had connections with our local clubs. Also present were Matt Charsky, an EFMLS officer and Northern Virginia Mineral Club member, and MSDC club member, Mark Dahlman.

Hope you enjoy the below peek into our mineral show outing!



## MINERAL MINUTES



Show Judge, Esther Kearns, places "Best in Show" ribbon on earth science gem and mineral display.



Gene Hartstein chats with Mark Dahlman; Ken Casey, President of the Delaware Mineralogical Society. Show Chairman, Wayne Urion & Ken Casey. Ed Fisher smiles for the camera.



A mineral connection is made with Dora Johns, a jewelry maker, and mineral fan.



The 2nd photo to the right is a polished fossil containing clam shells. Dave and Leslie Nanney enjoy the array of minerals.

## MINERAL MINUTES

**Pre-Meeting Dinner:** Join us for dinner at the Pier 7 Restaurant at 6:00 PM for dinner before the club meeting.  
650 Water St SW, (at S L St), Washington, DC 20024, (202) 554-2500, [www.pier7restaurant.com/Menu](http://www.pier7restaurant.com/Menu).  
**Please call Susan Fisher at 703-830-9733 to make a reservation if you wish to attend.**

**Visitors are always welcome at our monthly meetings and dinners!**  
**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 BY JANUARY 10.**

Pay at December or January meeting or mail to:

**Mineralogical Society of DC**

**P.O. Box 9957**

**Alexandria, VA 22304**

**Name(s)** (First and Last)

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Phone(s): Home/Work/Mobile \_\_\_\_\_

Email(s) \_\_\_\_\_

**OK TO INCLUDE YOU ON CLUB MEMBERSHIP LIST?** Distributed to Club members only.

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

President: Tom Tucker, [threedogtom@earthlink.net](mailto:threedogtom@earthlink.net)

Vice President & Program Chair: Andy Thompson, [thompson01@starpower.net](mailto:thompson01@starpower.net)

Secretary: Patricia Rehill, [patriciarehill@gmail.com](mailto:patriciarehill@gmail.com)

Treasurer: Rick Reiber, [Mathfun34@yahoo.com](mailto:Mathfun34@yahoo.com), (mail: c/o MSDC, P.O. Box 9957, Alexandria, VA 22304)

Director: Cynthia Payne

Director: Dave Nanney

Director: Dave Hennessey

Editor: Sheryl Sims, [sesims4@cox.net](mailto:sesims4@cox.net)

Co-Web Master: Casper Voogt & Betty Thompson, [www.mineralsocietyofDC.org](http://www.mineralsocietyofDC.org)

**Meeting Dates, Time, and Location:** The first Wednesday of each. (No meeting in July and August.) The National Museum of Natural History, Smithsonian Institution, 10<sup>th</sup> 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. If you park on the street, **THERE ARE NOW PARKING FEES, PAYABLE AT THE KIOSKS, AND ENFORCEMENT UNTIL 10 PM.**

# ***MINERAL MINUTES***



**Newsletter of the Mineralogical Society of the District of Columbia**



Mineralogical Society of DC  
P.O. Box 9957  
Alexandria, VA 22304  
U.S.A.

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