

Nittany Mineralogical Society Bulletin

Nittany Mineralogical Society, Inc.

P.O. Box 10664

State College PA 16805

November, 2008

www.ems.psu.edu/nms/

Editor: David C. Glick (see p. 8)

November 19th meeting:

Great Steps in the History of Life: Late Devonian Vertebrate Fossils from Pennsylvania and Beyond

by
Dr. Ted Daeschler

Our November meeting will be held Wednesday the 19th at 7:30 p.m., in the room 114 auditorium of Earth & Engineering Sciences Building on the west side of the Penn State campus in State College, PA. Maps are available through our web site.

*6:30 to 7:30 p.m.: Social hour, refreshments in the lobby
7:30 to 8:00 p.m.: announcements; door prize drawings
about 8:00 p.m.: featured program*

The event has free admission, free parking, free door prize drawings and free refreshments, and is open to all. Please tell everyone who's interested in fossils to come and hear our invited speaker, and share an enjoyable evening! - - Editor

Dr. Ted Daeschler is Associate Curator of Vertebrate Zoology, Academy of Natural Sciences, Philadelphia, and he has worked extensively on fossils from the Catskill Formation at Red Hill near Hyner and Renovo, PA, which several NMS members have visited. In his presentation, we'll see that this work was part of a larger project. Further information may be found at www.devoniantimes.org. He reports:

"This presentation will describe paleontological projects to search for Late Devonian-age fossils along Pennsylvania roadsides and high above the Arctic Circle in Canada's Nunavut Territory. Among the discoveries from these projects are the oldest limbed vertebrates from North America and *Tiktaalik roseae*, an animal that is widely recognized as the best evolutionary intermediate between fishes and limbed vertebrates. The presentation incorporates the logistics of exploration in these different terrains and the science behind the paleontological research."

ATTENDING THE NOVEMBER MEETING?

This event is free and open to all - bring a friend!

Donations of door prize specimens are invited.

Your additional snacks will be welcomed.

Junior Rockhounds Meetings

Junior Rockhounds meetings with hands-on, fun and educational activities will continue in room 117 EES Building on Thursdays this Fall:

Nov. 20: Identifying Sedimentary Rocks

Dec. 18: Identifying Metamorphic Rocks (not the 17th).

Check the web site for any updates, or call Dr. Andrew Sicree at 814-867-6263. - Editor

NMS DUES ARE PAST DUE

Our membership year and fiscal year ended on October 31st, so if you haven't paid your dues yet, please do so now. Send your completed form and payment promptly, or bring the form and payment to the Nov. 19th meeting. - Editor

Nittany Gem & Mineral Show 2009

As of Nov. 11, we are waiting for written approval from the school district to use Mt. Nittany Middle School for our 4th Annual Nittany Gem & Mineral Show on June 27-28, 2009 (set-up on Friday, June 26). We have every indication that we will receive approval, but we aren't sending out vendor contracts until we have it. Contracts will be mailed first to 2008 show vendors, then those from earlier years (particularly because our schedule prevented some of them from participating in 2008), then those on the waiting list. - Editor

Sale at December Meeting

Any NMS members with PA sales tax licenses who would like to sell at our December Social & Sale on the 17th are invited to contact Dave Glick (see p. 8) by Nov. 30. Details on commissions will be worked out soon.

History of NMS at January meeting

As part of the January meeting, we expect to have a segment on NMS history in recognition of our 15th anniversary. If you have any stories, photos, or other materials which were not included in the 10th anniversary program, or would like to participate, please contact Dave Glick (see p. 8). - Editor

Tax-deductible donations welcomed

by David Glick, NMS President

NMS received 501(c)(3) status from the IRS during 2008, which means that your donations to NMS are tax-deductible. Your donations will help fund our educational purpose and programs. Please make checks payable to 'NMS, Inc.', include a memo noting that it is a donation, and send to the P.O. Box (in banner, above). Or contact the president or treasurer (see p. 8) for more information.

NEWS FROM THE FEDERATIONS

Nittany Mineralogical Society, Inc., is a member of EFMLS, the Eastern Federation of Mineralogical and Lapidary Societies, and therefore an affiliate of AFMS, the American Federation of Mineralogical Societies.

The **EFMLS Newsletter** is available through the link on our web site www.ems.psu.edu/nms/ or remind Dave Glick to bring a printed copy to a meeting for you to see.

In the November issue, Steve Weinberger and Fran Sick report: "Get out your 2009 calendar and reserve the week of Friday, April 17 – Thursday, April 23 for the first of our two EFMLS **Wildacres** Workshops! Bruce Gaber, our speaker coordinator says that the speaker in residence for the session will be Dr. Michael Wise, a research mineralogist/ curator with the National Museum of Natural History, Smithsonian Institution, where he has worked since 1988. He is one of the world's leading authorities on the mineralogy of pegmatites. He is a Consulting Editor for Rocks & Minerals Magazine and an Adjunct Professor at the University of New Orleans. Mike is an engaging speaker and will regale us with tales of adventures from mountains in Southern California to the back roads of Madagascar."

New EFMLS President Mary Bateman introduces herself and her goals of having the President, regional vice presidents, and clubs all communicating well with each other. She will visit and speak to EFMLS clubs, and notes the importance of having each club send a representative to the annual convention. As another avenue of participation, there are openings for committee chairs in EFMLS.

In her Junior Activities column, Betsy Oberheim describes adapting children's card games such as "Go Fish" for young rockhounds. Decks of cards with rock and mineral pictures can be copied and laminated by a local copy shop. Kids can also participate in making up rock and mineral ID charts with glued-on chips, which will familiarize them with the various minerals.

Please see the complete newsletter for more on the Eastern Foundation Fund, Each One teach One Awards, the upcoming Bulletin competition, results of the recently completed competition, and the safety article on carbon monoxide.

The **AFMS Newsletter** is available by the same methods. In the November issue, Shirley Leeson brings everyone up to date on the cancellation of the AFMS meetings in Texas in September due to Hurricane Ike. The show and the South Central Federation meetings were able to go on. The cancelled activities are being conducted by mail or at other meetings. New President (and Pennsylvanian) Joy Bourne introduces herself and reviews the status of offices being filled and the ongoing evaluation of various programs. Fran Sick encourages us to be aware of all the possibilities provided by the EFMLS, and to share the AFMS and EFMLS Newsletters with all club members.

Taking action to make mineral shows kid-friendly is the focus of the Juniors column, which includes some examples and possibilities. Several AFMS Club Rockhounds of the

Year are honored. Ted Reith's Safety Corner addresses awareness and handling of chemically dangerous specimens. The winner of the 2008 AFMS program competition was a PowerPoint presentation on Franklin, NJ - Fluorescent Mineral Capital of the World. Winners of the 2008 AFMS Bulletin Editors Contest are listed. The current efforts in support of birthstones on U.S. postage stamps are reviewed, and letters of support to the Citizens' Stamp Advisory Committee are requested.

Please see the web sites for the rest of these articles and many others in both Newsletters. There's a lot there! - *Editor*

FINAL PRINT EDITION OF PENNSYLVANIA GEOLOGY

In the recently mailed issue (vol. 28, no. 2/3) of Pennsylvania Geology magazine, State Geologist Jay Parrish announces that it will be the last print edition of the publication. Future issues will continue to be available as PDFs on the DCNR/ PA Geological Survey web site; they will be larger and in full color. Anyone can request to be on an e-mail list to receive each PDF directly. See the current issue for additional information.

The left sidebar of the NMS web site home page has a link directly to the PA Geology Magazine web page containing current and future issues. - *Editor*

Elections held at Annual Meeting

Elections were held at the NMS, Inc., Annual Meeting on October 15, with the following results:

President:	David Glick	
Vice-President:	Robert Altamura	
Treasurer:	John Passaneau	
Secretary:	Frank Kowalczyk	- <i>Editor</i>

Allen V. Heyl, 1918 - 2008

Allen Heyl, a Pennsylvanian and professional geologist and mineralogist, was a long-time friend of the Nittany Mineralogical Society. He spoke at some of our symposia and supported us through membership, contributions, and sharing his extensive knowledge. He died on October 24, 2008, in Evergreen Colorado, and most of the following information comes from a comprehensive obituary in the Canyon Courier newspaper. This editor thanks Pen Ambler for providing the obituary. Readers are encouraged to see the obituary online; see the link toward the bottom of the NMS home page.

Born in Allentown, PA, in 1918, Allen attended Muhlenberg College there, received a BS degree from Penn State in 1941, and his PhD from Princeton in 1950. He spent his career with the US Geological Survey, moving from Washington, D.C., to Evergreen, Colorado, in 1968. He collected Pennsylvania minerals starting in childhood, and as an economic mineralogist was an expert on minerals in deposits of lead, zinc, silver, chrome and nickel. He discovered two minerals, and aheylite, a member of the turquoise group, was named for him. - *Editor*

Some recent collecting photos



Tim Holtz and Field Trip Chair Ed Echler at Middleburg Quarry. *D. Glick photo*



Fluorite collected by Ed Echler

T. Holtz photo



3/4 inch calcite crystal at Weaverland Quarry, Lancaster County (Friends of Mineralogy-PA trip). It was attached to the middle of a 3-ton boulder, so we took its picture and left it alone.

D. Glick photo



Banded chert from Bellefonte (actual size). *D. Glick scan*

President's Letter

from Dave Glick

My report from the annual meeting provides a summary of what's going on at the moment, so here it is for those who missed the meeting.

I thank all of the Board members, Committee chairs and committee members, and all other volunteers for their efforts over the past year. Because of them I believe that we are doing a very good job of meeting our ongoing goals, and are well organized and prepared to continue. They are finding time to do this while they are very busy with changing job responsibilities, families, medical situations, etcetera. We owe them a great deal for the time and effort which they contribute.

I'll briefly cover most of these aspects of NMS activities instead of having many individual reports, particularly because several of those involved could not be here tonight. The Treasurer will present his own report, and we'll have time for questions to anyone who is present at the conclusion.

As a reminder, the purpose of NMS is education and encouragement of interest in the field of mineralogy and the earth sciences.

As President, I preside at monthly meetings of the Board of Directors, which consists of the four elected officers and, at this time, three appointed committee chairs. I hope to see us get far enough ahead in our work and planning that we don't have to meet every month. Although I have been saying that all year, I really do think that we will get there. I'm slowly working on a written compilation of our procedures for running NMS, to help us be clear and consistent in what we are doing. Over the last year we applied for and received 501(c)(3) tax-exempt status from the IRS. Since the end of the tax year is coming, I'll take this opportunity to invite your tax-deductible cash contributions; we'll have an announcement in an upcoming Bulletin. I'm also the Show Chairman; we had a good Third Annual Nittany Gem and Mineral Show, which we were able to put together after a slow start. For 2009, we have applied for use of the Mt. Nittany Middle School (site of shows 1 and 2) for the last weekend in June, and expect to receive it. As Bulletin Editor, I think our Bulletin is a good one for a club of our size. We're able to include some color because we're printing it ourselves, and making the complete Bulletins available on our web site should be good advertising and also makes it available to interested non-members at no cost. I keep track of the membership records, because that merges well with mailing the Bulletin. We have about 87 addresses and 131 individual members (and only about a third have renewed, so please renew!). I didn't get membership cards done this past year, but I hope to do that early in the coming year, as well as distributing copies of the Bylaws to members. Finally for my report, I store and assemble the mineral sets which we have for sale as a fund-raiser; we're down to about a dozen sets and I plan to assemble 50 or 100 or more in the coming months, after we restock a few species.

Vice-President Bob Altamura takes on a variety of activities, not the least of which is his presenting our program

this evening. He arranges for all of our meeting rooms, which is more involved than one might guess, works on advertising our activities, and is always enthusiastic about activities for children and families. He gives some programs at schools, and he organized NMS's booth at Clearwater Conservancy's Spring Creek Family Festival Day recently; in spite of some rain at the start, it turned out very well. He's starting or advancing the earth science interests of lots of people. Thank you, Bob.

Treasurer John Passaneau will present his own report in a moment. I want to note in particular that soon after his election last year, he set up an Excel spreadsheet which is very useful for us to keep track of all aspects of NMS finances. Thank you, John.

Secretary Frank Kowalczyk stepped forward last year when we had a hard time finding a candidate, and we appreciate his filling that very important office and getting the job done despite his very tight schedule. Thank you, Frank.

Field Trip Chairman Ed Echler has been working hard. In the last couple of years, it has gotten noticeably more difficult to get permission to collect in quarries. Nevertheless, Ed has been successful; this calendar year we went to Curtin Gap in April, Mount Pleasant Mills in May, Oak Hall in August (with Friends of Mineralogy - PA Chapter), Middleburg and Mount Pleasant Mills in early October (with the Franklin County Rock and Mineral Club), and plan to go to a new location for our club on November 8. Thank you, Ed.

Junior Rockhounds Chair Andrew Sicree has a good program going this season. We set up the schedule in advance and advertised it, with the result that about 11 kids and 8 parents attended the September meeting. That's up from one to three or four kids per month last season (almost all of whom have moved away since then). Once people have experienced Andy's hands-on learning, personal contact style, they tend to come back, so we're looking forward to continued good attendance. Thank you, Andy.

Duff Gold took over the Program Committee a year ago, and I believe we are in quite good shape there. I can remember a few years ago when we would sometimes have a Board meeting on a Wednesday and still not know what the meeting program was going to be on the following Wednesday. This semester, we were able to send out a postcard to non-members listing four months of meeting topics (that was the same postcard as the Juniors schedule). We're now well into planning the Spring schedule, so we should be able to do an advance mailing again. I think that is very helpful to the Society. Thank you, Duff.

I'll make a plea here for some help for this group of hard workers. I think that a Publicity Chair is at the top of the list of people we need. [Tim Holtz has now volunteered to work on publicity, but more participation would be welcome.] In the past we've had a Refreshments Coordinator to arrange for food and drink at our meetings, and would like to have one again. Door prizes are another area which could be handled by someone, and perhaps you can think of some other way you could contribute. Please volunteer!

POPULAR MINERALOGY

Mineralogy and earth science for the amateur mineralogist and serious collector - #17

The Most Common Minerals on Earth

by Andrew A. Sicree

The most common minerals

A typical dealer's booth at a mineral show will display dozens if not hundreds of species of minerals. Many are rare—some are found only at a single locality. The very rarity of these minerals makes them desirable to collectors, but it also brings up a related question: Which are the most common minerals?

The crust and mantle differ from the core of the Earth in that the latter is nickel-iron while the former two layers are dominantly composed of silicate minerals. This might lead one to suspect that the most common minerals on Earth are silicates.

It is true that large portions of the Earth's surface are covered with carbonate sedimentary rocks (limestone and dolostone) and that these rocks are composed mainly of the carbonate minerals calcite and dolomite. But the total mass of carbonate rocks is small in comparison to that of the granites, diorites, gabbros, and basalts that make up most of the crust. On the other hand, much of the mantle is peridotite—a rock that is rather rare on the Earth's surface. Peridotites, granites, diorites, gabbros, and basalts are all silicate rocks, that is, they are made up of silicate minerals. So it indeed true that silicates are the most common minerals. But which silicate minerals?

The most common silicate minerals fall into eight mineralogical groups: the olivines, the pyroxenes, the amphiboles, the micas and clay minerals, quartz, the feldspars, the aluminum silicates, and the garnets. If you get to know these minerals, you'll be familiar with the vast majority of the minerals you will encounter in the field.

The olivines

Look up the olivines, the pyroxenes, the amphiboles, and the micas, in a descriptive mineralogy text. At first glance, these minerals appear to be unrelated. But they become more understandable if you examine the silicon-to-oxygen ratios (Si:O ratios) of their chemical formulas.

Note that we use plural names like "the olivines." Olivine refers to a group of related minerals rather than a single mineral. The minerals forsterite, fayalite, and monticellite are in the olivine group. Likewise, the terms pyroxene, amphibole, or mica, refer to mineral groups rather than single species.

Most of the common olivines are part of the forsterite-fayalite series and are, appropriately enough, olive-green or dark green in color. Forsterite has the formula $(\text{Mg})_2\text{SiO}_4$ and fayalite has the formula $(\text{Fe})_2\text{SiO}_4$. These two minerals form a *continuous solid solution series*, which means that magnesium

(Mg) can substitute for iron (Fe) in the crystal structure. For instance, it is possible to have minerals with 50% Fe and 50% Mg, or with 30% Fe and 70% Mg. Any composition is possible between 100% Fe (with 0% Mg) and 100% Mg (0% Fe). In practice, one cannot determine the precise Fe:Mg ratio of a specimen without a chemical analysis. One usually sees a general formula for the olivines expressed as $(\text{Mg,Fe})_2\text{SiO}_4$ because of the ability of Mg and Fe to substitute for each other.

Regardless of the percentages of magnesium and/or iron present, the Si:O ratio is 1:4 for all olivines. If you were to examine the structure of an olivine on the atomic level, you would find that each silicon atom is bonded to four oxygen atoms in a tetrahedral arrangement and that these tetrahedra are not bonded to each other, but rather are isolated from each other by magnesium and iron atoms. Thus, the olivines in general and the individual minerals such as forsterite, fayalite, and monticellite, are called island silicates or *nesosilicates*.

The pyroxenes and the amphiboles

If the silicate tetrahedra are not isolated islands but rather are joined together at two of their corners, they can form long chains of silica tetrahedra and form minerals called *inosilicates*. A single chain of silica tetrahedra has a Si:O ratio of 1:3. A double chain (or band) of silica tetrahedra has a Si:O ratio of 1:2.75. The pyroxenes are single chain inosilicates, and the amphiboles are double chain inosilicates.

The pyroxene group includes minerals such as enstatite, hypersthene, augite, diopside, jadeite, and hedenbergite. Even spodumene, which has the formula $\text{LiAlSi}_2\text{O}_6$, is a pyroxene. Note that spodumene has Si:O ratio of 2:6, which is equivalent to a 1:3 ratio.

The amphibole group includes minerals such as tremolite and ferroactinolite and anthophyllite. Ferroactinolite has the formula $\text{Ca}_2\text{Fe}_3\text{Si}_8\text{O}_{22}(\text{OH})_2$. The Si:O ratio of 8:22 translates into a 1:2.75 ratio.

At first, it is difficult to differentiate pyroxenes from amphiboles in hand specimens. One useful clue is found in their cleavages. On broken surfaces, both will display two cleavage directions. For pyroxenes the cleavage planes are usually at an angle of 87°-88° to each other—this is pretty close to 90°, so they will tend to look like they are at right angles to each other. In the amphiboles, cleavage planes are usually about 123° or 57° degrees to each other—amphibole cleavages are clearly not at right angles. And in general, amphiboles tend to occur as elongated, lath-like crystals while the pyroxenes more commonly occur as stocky crystals when they are found as euhedral crystals rather than in masses.

The micas

Micas and the clay minerals are *phyllosilicates* or sheet silicates. Here, each silica tetrahedra is bonded to three others; a large number of tetrahedra will form a planar sheet made of hexagonal rings of silica tetrahedra. The Si:O ratio of a sheet silicate works out to 1:2.5. Phlogopite, biotite, muscovite, and other micas are all phyllosilicates. (Not all layer silicates are micas. Talc is also a layer silicate, for instance.) The sheet-like arrangements of the silica tetrahedra are why micas will cleave into thin, flat sheets.

Although they are not as common as the major rock-forming silicates described above, there are two other classes of silicate minerals. These are the *sorosilicates* and the *cyclosilicates*. The sorosilicates have isolated pairs of silica tetrahedra and include minerals such as hemimorphite. The cyclosilicates have their silica tetrahedra arranged in rings. Beryl is an example of a cyclosilicate.

The framework silicates: quartz

The final major class of silicate minerals is the *tectosilicates* in which the Si:O ratios are 1:2. In the tectosilicates silica tetrahedra are bonded together into three-dimensional frameworks. Quartz, with a chemical formula of SiO_2 , is an example of a tectosilicate, as are the other silica minerals such as tridymite and cristobalite.

The feldspars

The feldspars are also among the tectosilicates. In the feldspars, aluminum can take the same sites as silicon, so we look at both aluminum and silicon when calculating the "Si:O" ratio of 1:2. Two major groups of feldspars are the *alkali feldspars*, which have the general formula $(\text{K,Na})\text{AlSi}_3\text{O}_8$, and the *plagioclase* series feldspars, which have the formula $(\text{Na,Ca})(\text{Al,Si})_4\text{O}_8$. Note that both series have two oxygen atoms for every silicon (and/or aluminum).

The aluminum silicates

The aluminum silicates include common minerals such as staurolite, andalusite, kyanite, and sillimanite. (Chiastolite is a variety of andalusite.) Topaz is also an aluminum silicate. One should note that andalusite, kyanite, and sillimanite are polymorphs. They all share the same Al_2SiO_5 chemical formula, but the arrangement of the atoms is slightly different in each. These three minerals are found in aluminous rocks. Which mineral is found depends upon the temperatures and pressures to which the rock has been exposed. In general, kyanite is the high pressure form of Al_2SiO_5 , sillimanite is the high temperature form, and andalusite is formed at lower temperatures and pressures.

The garnets

Garnet is not a single species, but rather is a group of minerals that includes pyrope, almandine, spessartine, grossular, andradite, and uvarovite. The general formula for garnets is $\text{A}_3\text{B}_2(\text{SiO}_4)_3$ in which A could be calcium, magnesium, iron or manganese, and B could be aluminum, iron, or chromium. Note that the Si:O ratio is 1:4.

Talents and coppers: counting rocks

Way back in the days of the ancient Greeks, before the modern Geeks invented the electronic calculator, early clerks used a "counting board" to tally up their accounts.

One of the few surviving ancient counting boards is the "Salamis Tablet." Made of polished marble, the Salamis Tablet has letters chiseled into it corresponding to the denominations of ancient coins, ranging from "T" for the *talent* down to "X" for the *chalkós*. (A *chalkós* is one-eighth of the obol, which is one-sixth of the *drachma*, which is one-six-thousandth of a *talent*. Thus, there are 288,000 *chalkós* in a *talent*.)

The counting board was used by placing small rocks as counters above the various symbols for the various currency values. As one added or subtracted values, the counters would be rearranged. The counters were called *pséphoi* ("pebbles") and the word *pséphizein* meant "to compute" or "to calculate," but its literal meaning is "to pebble." Thus, an accountant is really a pebbler!

What is interesting to the mineralogist about this early system is that the word *chalkós* means "copper" or "ore." Is it just a coincidence that the smallest currency unit in ancient Greece was the "copper" and that today in the U.S., we use the copper penny as our smallest coin?

It is also interesting to note that some African societies traditionally used a form of copper money in which the copper metal was cast not into a coin but rather into a large "X"-shape about 10 inches (25 cm) across. Is this shape the source of the "X" symbol used for the *chalkós*?

Ref: Menninger, Karl, 1969, *Number Words and Number Symbols*, Dover, New York, p. 299-300.

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Dr. Andrew A. Sicree is a professional mineralogist and geochemist residing in Boalsburg, PA. This **Popular Mineralogy** newsletter supplement may not be copied in part or full without express permission of Andrew Sicree. **Popular Mineralogy** newsletter is published by Andrew A. Sicree, Ph.D., P. O. Box 10664, State College PA 16805. Write or call (814) 867-6263 or email sicree@verizon.net for more information. Supplements are available on a subscription basis to help mineral clubs produce better newsletter. Write for a free sample and subscription form.

Crystal Matrix Crossword

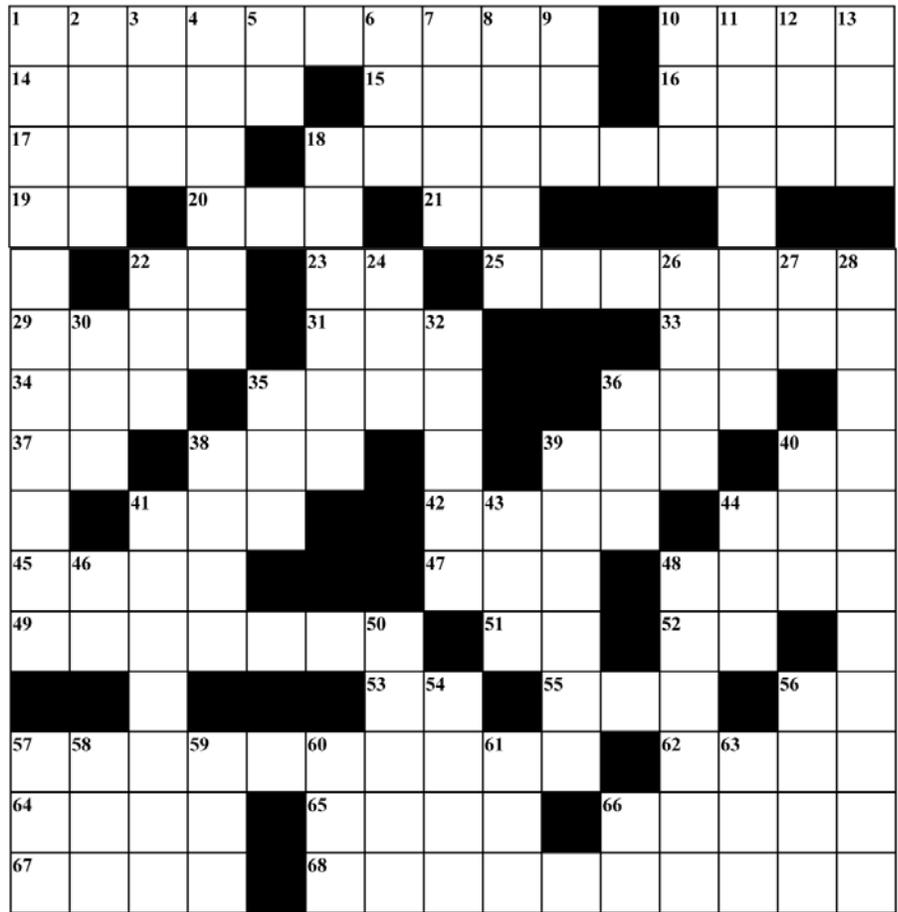
Common Mins and More

ACROSS

- 1 Mg-rich olivine
- 10 Spanish man's name
- 14 where the cows roam
- 15 straight and narrow
- 16 Norwegian city
- 17 shape of strong mine tunnel
- 18 guys who study the Earth
- 19 Canadian province (ab.)
- 20 International mineral group (ab.)
- 21 element that is found in meteorites
- 22 delta state
- 23 element used in psychiatry
- 25 more than one unusual Australian
- 29 what barbarians do
- 31 having to do with the ecology
- 33 sign element
- 34 charged "+" or "-"
- 35 black, cryptocrystalline
- 36 postage paid (ab.)
- 37 state of the Wise Mine
- 38 terrorist group (ab.)
- 39 large Asian beast
- 40 not for Wizard of Oz
- 41 gets on shoes in a mine
- 42 when the Allies attacked
- 44 day to thank God for
- 45 what soccer is played on
- 47 long time
- 48 earth science (ab.)
- 49 largest continent
- 51 big gold rush state
- 52 used to be Cb
- 53 element in antimonite
- 55 where beauty is
- 56 politically correct
- 57 mica found in kimberlite
- 62 Spanish island
- 64 what petroleum is
- 65 needed by a noun
- 66 horse race and tie
- 67 Spanish house
- 68 polymorph of sillimanite

DOWN

- 1 zinc spinel mineral
- 2 used to row row your boat
- 3 national GOP
- 4 found with garnets
- 5 in camp lantern mantles
- 6 route (ab.)
- 7 element of an Age
- 8 Dutch flower
- 9 equal employ. opp. (ab.)
- 10 French king



- 11 what the assayer did
- 12 ultimate (ab.)
- 13 the in Spanish
- 18 lead ore
- 22 first work day
- 24 dangerous road
- 26 turnpike (ab.)
- 27 polonium
- 28 chain silicate
- 30 ___ la la
- 32 group for ruby, hematite
- 35 what rocks are
- 36 what miner works for
- 38 a catamount
- 39 guy from Maine
- 40 Spanish gold
- 41 rock used for sinks
- 43 dead on arrival (ab.)
- 44 month of Tucson show
- 46 Europe's element
- 48 metamorphic rock
- 50 tree and town in CO
- 54 worth two in the bush
- 56 to mark on a map
- 57 low-rank soldier

- 58 Chinese name
- 59 ___ la!
- 60 egg
- 61 to be announced (ab.)
- 63 science (ab.)
- 66 Australia (ab.)

LAST MONTH'S SOLUTION:

Miscellany



Some Upcoming SHOWS AND MEETINGS

Our web site <http://www.ems.psu.edu/nms/> has links to more complete lists and details on mineral shows and meetings around the country.

May 20 - 25, 2009: Inter-regional Rockhound Rendezvous (by NFMS and CFMS), to Davis Creek. Lassen Creek, California, for obsidian. Information coming soon to www.cfmsinc.org

June 27-28, 2009: We're awaiting approval for this date for our 4th Annual Nittany Gem & Mineral Show. See page 1.

Oct. 17 - 18, 2009: EFMLS Convention, and Annual Gem & Mineral Show sponsored by the Bristol Gem & Mineral Club. Beals Community Center, Bristol, CT .*

INVITE A FRIEND TO JOIN THE SOCIETY

The Nittany Mineralogical Society prides itself on having the finest line-up of speakers of any earth sciences club in the nation. If you'd like to be part of our Society, dues are \$20 (regular member), \$7 (student rate), \$15 (seniors), \$30 (family of two or more members, names listed). Your dues are used for programs and speakers, refreshments, educational activities, Bulletins, and mailing expenses. Please fill out a membership form, make checks payable to "Nittany Mineralogical Society, Inc." and send them to
Nittany Mineralogical Society, Inc.
 P.O. Box 10664
 State College, PA 16805
or bring your dues to the next meeting.
We want to welcome you!

Tumbling Grit Available to Members

As a benefit of NMS membership, we have some silicon carbide grit to provide in moderate quantities to members. It's in the broadly graded categories suitable for tumbling and rough work: 36/60, 60/120, 120/220, and 220/finer. Contact Dave Glick (contact information at right) if you would like some. Dave may also be able to give you small quantities of 600 grit to complete the sequence. Unfortunately, we don't have any polish to provide.

Also, if anyone wants to organize a group purchase of materials for members, we would be glad to announce it in this Bulletin.

For sale / trade: Equipment & Materials

For sale: Very nice **rock and mineral collection** along with four **display cases**. Call Dale at 717-252-1363.

Mineral Business and personal collection for sale (hundreds of specimens plus supplies and equipment included). Call Terry at 570-672-2325 Mon. - Sat. 9:00 a.m. - 11:00 p.m. If I'm not there, leave a message.

For sale: Very large collection of gemstone material, prefer to sell as one lot; including much jade in various types & colors; mostly rough, plus some slabs; some fine Coober Pedy opal. Also equipment and jewelry making supplies from jewelry studio and production shop. Contact Daniel G. Reinhold in Mill Hall, PA; phone 570 748-3201 after lunch every day, or e-mail: dreinhold@suscom.net *

SOCIETY OFFICERS

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The Bulletin Editor will welcome your submissions of articles, photos, drawings, cartoons, etc., on minerals, fossils, collecting, lapidary, and club activity topics of interest to the members. Please contact:

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Newsletter submissions are appreciated by the first Wednesday of the month. If you include photographs or graphics, please do not embed them in word processor files; send them as separate graphics files (TIF, or good to highest quality JPEG files, about 1050 pixels wide, are preferred). Please provide captions and the name of the photographer or artist.