Nittany Mineralogical Society Bulletin

Nittany Mineralogical Society, Inc.
P.O. Box 10664
State College PA 16805

September, 2008 **www.ems.psu.edu/nms/** *Editor: David C. Glick (see p. 8)*

September 17th meeting:

The last 600 million years of central Pennsylvania history, or *Why do we have all these sandstones and mud rocks?*

Presented by Paul Zell

Our September meeting will be held Wednesday the 17th 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.: Show and Tell program

photo courtesy of Rita Inez Zell

The event has free admission, free parking, free door prize drawings and free refreshments, and is open to all – please come and share an enjoyable evening! - - Editor

Paul Zell, Geoscience Instructor at Penn State's Altoona campus, will present a talk on the geological history of our area. Those who attend our events may know Paul from his long-term participation in Minerals Junior Education Day and Junior Rockhounds programs. We're pleased to have Paul speak at our regular meeting. Please join us! *- - Editor*

ATTENDING THE SEPTEMBER 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.

Trip to Franklin Show?

by Dr. Andrew Sicree

Andrew Sicree is still interested in organizing a trip to the Franklin, New Jersey, Show on Saturday, September 27. In addition to that indoor-and-outdoor show, there are possibilities for collecting at *(Continued on page 2)*

Junior Rockhounds

Meetings to Start on September 25

Junior rockhounds meetings are planned for Thursdays this Fall: Sept. 25, Oct. 30, and (tentatively) Nov. 20 and Dec. 18. The tentative plan is to meet in room 117 EES Building, the same as last Spring. Check the web site for any updates, or call Dr. Andrew Sicree at 814-867-6263.

NMS Dues are Due

Members will find a dues form enclosed with this Bulletin. Please send your completed form and payment promptly, or bring the form and payment to the Sept. 17th meeting. This will reduce the effort and postage required to send additional notices.

The mission of NMS, as stated in our Articles of Incorporation, is education and encouragement of interest in the scientific fields of mineralogy and the earth sciences. Your dues are used to accomplish that mission by paying for: printing and mailing the Bulletin, insurance which allows NMS members to undertake field trips and other events, honoraria for invited speakers, dues to the Federations which provide services and further our goals, and other projects chosen by the Board of Directors.

NMS & Minerals at Spring Creek Day

from press release

Clearwater Conservancy will hold its Spring Creek Day Family Festival on Sunday, September 28th, from noon to 5:00 p.m. The location is Millbrook Marsh Nature Center, 614 Puddintown Rd., State College. Come celebrate our wonderful Spring Creek Watershed through hands-on science, geo-caching, archaeological digs, scavenger hunts, artist-in-action, crafts, music, good food, canning demonstrations, Spring Creek Canyon talk, and so much more. This is a free event. For more information contact ClearWater Conservancy at 814-237-0400 or see the web site www.clearwaterconservancy.org/springcreekday.htm

NMS plans to be one of the exhibitors, with Bob Altamura organizing a display and discussion of crystal growth in minerals. **NMS members, please contact Bob** (see page 8) if you can help talk about minerals and crystals for an hour or two (we can train you in what to say).

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Trip to Franklin Show? *(cont. from page 1)*

Sterling Hill (for a fee), attending Sterling Hill's mineral garage sale, and taking the Sterling Hill underground mine tour.

Projected round trip transportation cost is on the order of $35.00, admissions and fees not included. Contact Andrew Sicree <sicree@verizon.net> now to express your interest and find out more. ❄

NMS Fall Meeting Programs

We will meet as usual on the third Wednesday evening of the month in the room 114 auditorium of EES Building. Watch this Bulletin and the web site for any updates.

Oct. 15: Dr. Bob Altamura (Excelsior College):
Fluid-filled Bubbles in Minerals: Trapped Mineralizing Solutions

Fluid droplets trapped during the process of crystallization of minerals from hot-water solutions and rock melts can yield information about the temperature and pressure of formation – as well as the composition of ancient mineralizing fluids or melts. Case studies of a one-mile long quartz vein complex in southeastern Connecticut and quartz veins adjacent the Gulf of Suez near Gebel Zeit (Oil Mountain), Egypt will be included.

Nov. 19: Dr. Ted Daeschler (Associate Curator of Vertebrate Zoology, Academy of Natural Sciences, Philadelphia):
Great Steps in the History of Life: Late Devonian Vertebrate Fossils from Pennsylvania and Beyond

This presentation will describe paleontological projects to search for Late Devonian-age fossils along Pennsylvania roadsides and high above the Arctic Circle in the 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.

Dec. 17: Holiday Social and Sale (watch for location and details) ❄

FIELD TRIPS COMING

We had a good trip to Oak Hall, shared with several members of Friends of Mineralogy - Pennsylvania Chapter, late in August. Other trips are in the planning stages. Members can be added to the list by contacting Field Trip Chair Ed Echler (see page 8). - - *Editor*

Election Candidates and Committee Volunteers

by David Glick

Elections are coming up at our corporation's Annual Meeting on October 15. No volunteers or nominations were received in response to last month's Bulletin announcement. The candidates put forth by the Nominating Committee at the September 3 meeting of the Board are the current incumbents:

President:	David Glick
Vice-President:	Robert Altamura
Treasurer:	John Passaneau
Secretary:	Frank Kowalczyk.

Any additional nominations or volunteers for office would be appreciated no later than the September 17th meeting.

NMS is also **seeking volunteers** to engage in publicity and public relations, Junior Rockhounds activities, organizing refreshments for meetings, and more. Please contact Dave Glick or another Board member (page 8) if you'd like to volunteer. ❄

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.

The EFMLS September Newsletter announces that the 2009 Convention will be at the Bristol, Connecticut, show on the weekend of October 16-18. President Ellery Borow encourages clubs to have an ongoing dialogue with their regional vice-presidents. Safety during hot summer collecting, changes to the Bulletin Editors Contest, and poetry as a creative activity for juniors are included.

The AFMS Newsletter is available by the same methods. In the September issue, the prizes for the AFMS Endowment drawing are pictured in color (in the online version). Activities at the AFMS/SCFMS Convention Sept. 25-18 in Humble, Texas, are previewed. There is an extensive report on all that went on at the Tri-Federation Rockhound Rendezvous and Field Trip in late May in Nevada. There's a challenge to have at least one club from each state participate in the Future Rockhounds of America program (there are participants in only 22 states so far). All-American Club Yearbooks and the AFMS Club Rockhounds of the Year are covered. Warnings about the Paleontological Resources Preservation Act, suggestions for exhibiting, judging exhibits, and making our clubs available and accessible to new members are included.

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

Some Pennsylvania Shows and Events

from their web sites and press releases

Mechanicsburg (Harrisburg area), Sept. 13-14

Central Pennsylvania Rock and Mineral Club's 43rd Annual Gem, Mineral, and Jewelry Show will be at a new location in Mechanicsburg this year. It's at Eagle View Middle School (behind Cumberland Valley High School), 6746 Carlisle Pike, Mechanicsburg, PA 17050. Hours are Saturday 10-6 and Sunday 10-5; admission for adults is $5.00, kids 12 and under free. The web site has a discount coupon, list of vendors, and schedule of special programs presented by geologist Jeri Jones: www.rockandmineral.org

Macungie (Allentown area), October 4

The Autumn Mineralfest - Mineral, Fossil, and Gem Show - sponsored by the Pennsylvania Earth Sciences Association, will be held on Saturday, October 4, 8:30 a.m. to 3:00 p.m. Held at the Macungie Memorial Park in Macungie, eight miles southwest of Allentown, PA, it's an indoor show, held rain or shine.

The emphasis is on minerals: Displayed material typically runs 65 to 75 percent mineral specimens, with additional inventory including fossils, gemstones, and jewelry.

A diverse group of dealers and inventory are featured. At the Mineralfest, dealers of high-end specimens can be found set up elbow-to-elbow with collectors paring down their collections. Show organizers have made an effort to include a large number of vendors (about 60) of widely ranging interests - our vendors currently include species collectors, Pennsylvania locality specialists, fluorescent mineral enthusiasts, fossil experts, and avid field collectors. They bring with them a healthy mixture of classic and contemporary material, including some from old-time collections, and some which was field-collected only a few weeks prior.

Mineralfest features:

- Over 100 tables of specimens for sale or trade
- A nice mixture of contemporary, classic, and field-collected specimens
- Dealers and collectors from a wide geographic area
- Special darkroom for fluorescent mineral collectors and displays
- Free specimens and special activities for children
- Our 51st semi-annual show at this location
- Breakfast and lunch available.

For more information, see **www.mineralfest.com** or email: mineralfest@verizon.net

Pittston, October 4

The **Walkway Through Our Past** event will be held Saturday, October 4, from 10:00 a.m. to 5:00 p.m. at the Riverfront Park, Kennedy Blvd., Pittston. It's free educational fun for the whole family; bring the kids and re-discover our heritage! Including minerals, mining, history, the environment and much more, it's presented by the Greater Pittston Historical Society, the Luzerne County National Recreational Trail Inc., the Mineralogical Society of Northeastern Pennsylvania, the Foundation for Lapidary Arts and Goldsmithing, eJewelryOriginals.com, and the Society for Pennsylvania Archaeology - Frances Dorrance Chapter. Some of the earth science-related activities include a Knox Mine Disaster site tour, fluorescent mineral display, "You Cut Gemstones," and flint knapping (arrowhead making). The contact for the Mineralogical Society's public relations is Char Overturf, 570-388-2892, char@ejewelryoriginals.com

Worthington (Kittanning area), October 11 - 12

Another show that's been around for a while is the Kit-Han-Ne Rock & Gem Club Show, north of Pittsburgh. It's at the West Franklin Firehall, corner of Cherry and Linton Streets., in Worthington, PA, 7 miles west of Kittanning on U.S. Route 422. Six vendors are expected, and along with the vendors are club member display cases, a gem mine for the kids (young and older), Bliko for the kids, and a silent auction. Show hours are 10-6 on Saturday and 10-5 on Sunday. Driving to the show should be wonderful, as the autumn leaves peak here at this time of year. See www.facetersco-op.com/zabinski/gemshow.htm ❄

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10 Years Ago in NMS

Our September 1998 meting program was Mineral ID Night (and a mineral ID contest) preceded by a wine and cheese social. The fourth annual Minerals Junior Education Day was being planned for October. The Saltillo mastodon dig was continuing, with two Saturday digs in September. The Nittany Junior Rockhounds program was in progress, with monthly meetings.

50 Years Ago in Rocks & Minerals

The Sept.-Oct 1958 issue reported on the founding of the Berks Mineralogy Society in 1957, and its first field trip in May, 1958, to Bethlehem Steel's limestone quarry at Bridgeport, Pa. An article by Howard Hamilton reported on a plant and dragonfly fossil locality off route 309 south of Wilkes-Barre. ❄

POPULAR MINERALOGY

Mineralogy and earth science for the amateur mineralogist and serious collector - #16

The Flying Dragons of The Carboniferous

by Andrew A. Sicree

Just how big can a bug get?

The biggest insect ever to roam the earth didn't do much roaming – it flew! We joke about mosquitoes big enough to carry off pets and small children, but way back in the Carboniferous coal swamps the dragonflies were much bigger than the biggest baddest bug beating its wings down in the bayous today.

Meganeura monyi is the name that paleoentolomogists (scientists who study fossil insects) have given to the biggest insect ever to have roamed – or rather flown – the Earth. *Meganeura monyi* was a giant version of a modern dragonfly and had a wingspan greater than 30 inches (75 cm) across. By comparison, the largest modern-day dragonfly is *Anax strenuous* (the Giant Hawaiian Darner or the Giant Hawaiian Dragonfly) which has a wingspan up to 7.5 inches (19 cm). *Meganeuropsis permiana* is another early dragonfly, found in the early Permian. At 28 inches (71 cm) its wingspan rivals that of *Meganeura monyi*. These bigger-than-most-birds dragonflies were predatory, capturing other insects in flight and perhaps feeding on small amphibians.

The oldest dragonflies

Paleoentolomogists report that the oldest known dragonfly fossils have been recovered from Upper Carboniferous (i.e., Pennsylvanian) sedimentary rocks in Europe. The Carboniferous Period stretched from about 360 million years ago to about 286 million years ago. It is divided (especially in North America) into the Mississippian (the Early or Lower Carboniferous – approximately 360-320 million years ago) and Pennsylvanian (Late or Upper Carboniferous – about 320-286 million years ago) periods.

Meganeuropsis permiana and other now-extinct ancestral dragonflies are classified into the extinct order *Protodonata*. Modern-day dragonflies belong to the order *Odonata* (the name is taken from "odonto-," the Greek word for tooth, a reference to the toothy jaws found in most adult dragonflies). Although *Meganeuropsis* looked much like a huge version of the modern-day dragonfly, there are some important differences between the two groups. Dragonflies of both *Odonata* and *Protodonata* strong spiny legs and toothy jaws, which facilitate the capture of prey, but the *Protodonata* were, of course, enormous compared to modern-day dragonflies. The jaws of the protodonates were larger than those of modern dragonflies and their legs were stronger and longer. Their forewings are usually slightly longer and a bit thinner than their hindwings. These early dragonflies lacked a wing notch (the *nodus*) and the *pterostigma* (the blood-rich colored patch on a dragonfly's wing). Because of the differences between the two groups, some authors have suggested that the term "giant dragonfly" be replaced with "griffinfly."

Insects of the order *Odonata* first make their appearance in the Triassic (245-208 years ago); the *Protodonata* went extinct in the Triassic about the same time as the earliest dinosaurs appear.

Why so big?

Scientists continue to debate the causes of gigantism among ancient insects. One theory states that insect body size is limited by the way an insect gets oxygen. It is thought that insects get oxygen by *diffusion* through their tracheal tubes rather than by "breathing" air in and out. Thus, the theory postulates, insects were able to grow much larger in the Carboniferous because the atmosphere had higher levels of oxygen than the present-day 20%. Other entomologists contend that insects really do breathe (by means of rapid expansion and contraction of their tracheal tubes) and thus the atmosphere of the Carboniferous need not have been oxygen-rich to support gigantic insects.

Dragonfly fossils in Appalachia?

Because dragonflies lived near water, one might suspect that they would be likely candidates for fossilization. Paleontology books depict reconstructed dioramas featuring giant dragonflies buzzing through the ancient coal swamps. It is not unusual to find ferns and other plant fossils by the ten of thousands preserved in the coal and shale of Appalachian coal mines. Why don't we find more dragonfly fossils among all these ferns?

One problem may be that, being predators at the top of the insect food chain, large dragonflies weren't all that common. Another consideration is that, because of their large but somewhat delicate bodies, it would be unusual for an entire dragonfly to be preserved intact. Indeed, most specimens of Carboniferous and Permian fossil dragonflies are known from

wing fragments few of which are even complete wings. Body fossils are even rarer.

Another factor may be a matter of who is looking for them. Modern coal mining is heavily mechanized and the miner has little opportunity to climb down out of his haul truck and search for fossils. The best hope for finding dragonfly fossils is to go to sites at which the rocks are of the correct ages and at which fossils of plants are preserved. Even more important would be to identify sites from which other, smaller fossil insects have been recovered.

To find a fossil dragonfly

Dragonfly fossils were first recognized in Europe. In 1880, fossils of *Meganeura monyi* were discovered in the Stephanian Coal Measures near Commentry, France.

In North America, protodonatan fossils have been found in rocks from the Grand Canyon in Arizona. Many important fossil dragonflies have been found in the Permian strata of Kansas and Oklahoma. The largest complete insect wing ever recovered is of *Meganeura americana*, found in Oklahoma in 1940; it can be seen at the Harvard Museum of Natural History.

Odonata fossils are more common. The have been found in the Upper Triassic in Italy, and the famous Solnhofen lithographic limestones of Upper Jurassic age in Germany. China produces dragonfly fossils, and some are also found in the Lower Cretaceous Crato Formation of northeast Brazil. This is not a comprehensive list; many other localities are known.

In the Eastern U.S., however, only a few fossils of *Protodonata* are known. In 1889, a specimen of *Paralogus aeschnoides* was found in Upper Carboniferous rocks near Silver Spring, East Providence, Rhode Island.

A wing fragment in black shale, attributed to the species *Palaeotherates pennsylvanicus*, was collected in 1887 from Coxton, one mile north of Pittston, Pennsylvania. It appears that the specimen was taken from the Upper Pottsville Formation. A specimen of *Tupus durhami* was collected in 1939 from the roof shale over the No. 4 Coal at a coal mine in Catoosa (Durham Quadrangle), Georgia. Interestingly, it appears that this fossil came from the Pottsville Series of Georgia and is of Lower Pottsville age – this corresponds approximately to the lower portions of the Pottsville Formation in Pennsylvania.

A more recent find in Pennsylvania is that of *Palaeothertes analis*, which is preserved at the William Penn Museum in Harrisburg. This specimen came from the underclay of the Buck Mountain #5 anthracite, part of the Allegheny Series. It was found in a strip mine located 400 meters east of benchmark 1271 on the St. Clair-Mahoney City Road, in Blythe Township, Schuylkill County, Pennsylvania.

Ideal vs. Real Formulas in Minerals

Mineralogy texts often accompany their descriptions of each mineral with a chemical formula. Articles in magazines such as *The Mineralogical Record* may also give formulae for minerals. And mineral lists such as Fleischer's *Glossary of Mineral Species* (the 10th Edition, released in 2008, authored by Malcolm Black and Joseph A. Mandarino) give mineral formulae, too. The observant collector will notice that sometimes there are differences between the ways different literature sources report formulae for the same mineral.

This may be because the older source is reporting the mineral formula as it was known originally, while another source is reporting a more-accurate formula based on later data. Sometimes, there are perfectly valid, but different, ways to write a mineral's formula. For instance, John Sinkankas' *Mineralogy* gives $HFeO_2$ as the formula for the common mineral goethite. Other sources use FeO(OH). Note that both give the same ratios of Fe, H, and O.

But discrepancies can also be because one literature source is reporting the "ideal" chemical formula while another is reporting the actual chemical formula for the mineral as found in nature. One example of this may be seen by examining the case of franklinite. Franklinite is "zinc iron oxide" and the ideal formula is $ZnFe_2O_4$

In this formula, zinc is present as Zn^{2+} and iron as Fe^{3+}, while oxygen atoms have a "minus two" charge (i.e. O^{2-}). Electrical charges are balanced in this formula. Four oxygens in the minus two state give a total of eight negative charges. Two irons in the three plus state give a total of six positive charges, and two more from the zinc ion bring the total to eight positive charges. Thus, the mineral is electrically neutral.

An actual specimen of franklinite may contain a substantial amount of manganese (Mn). How does that fit into the picture? In such a case, the formula is closer to $(Zn,Mn,Fe)(Fe,Mn)_2O_4$. Putting the first three elements in the first set of brackets indicates that some of each of those elements (as Zn^{2+}, Mn^{2+} or Fe^{2+}) is occupying the position that Zn^{2+} held in the ideal formula. Likewise, either iron or manganese may occupy the site held by iron in the ideal formula. Note that the iron and manganese must be in the "three plus" state (as Fe^{3+} or Mn^{3+}) to produce an electrically-neutral mineral. This actual formula gives us more information than the ideal formula does. It tells us, for instance, that both iron and manganese are present in franklinite as both "plus two" and "plus three" ions.

Weird Geology

Ultraviolet Auroras

The Northern Lights or the aurora borealis are an eerie, beautiful phenomenon best observed in Alaska and northern Canada, but also visible much further south. Driving west from New York City on I-80 late one night, I was surprised to encounter a large number of cars parked along the roadside with the drivers standing outside staring to the north. It looked like a scene from "Close Encounters of the Third Kind." Naturally curious, I stopped too, expecting maybe to see a UFO. No UFO's were visible, but what I did see was a wavy pulsing curtain of deep blue and purple – the Northern Lights.

What I didn't know at the time was that I should've hauled out my freshly collected calcite and willemite specimens (I had been at a night dig at the Sterling Hill Mine in Odgensburg, NJ – a famous locality for fluorescent minerals) and checked to see if they glowed under the aurora.

The aurora is created when "energetic" particles from the Sun smash into the Earth's upper atmosphere. Mostly, these particles are the nuclei of hydrogen atoms (i.e., protons) and electrons. When they hit gas molecules in the upper reaches of the Earth's atmosphere (above 80 kilometers or 50 miles) they knock off electrons. As the electrons recombine with the gas molecules, they give off light.

The colors you see are a function of the energy of the solar particles. If the incoming particles have energies of a few hundred electron volts, they don't get below altitudes of about 200 km (125 miles) and they produce a red aurora. Solar particles with energies of about 1 kiloelectron volt (KeV) create auroras that are greenish-yellow. And their more-energetic buddies, those with energies around 10KeV, penetrate deeper into the Earth's atmosphere (below 100 km or 63 miles) and stir up auroral colors that can be deep purple.

If you get even more powerful solar particles, with energies above 100 KeV, the auroral emissions will occur in the ultraviolet. In theory then, one should be able to get a tan at night in the winter above the Arctic Circle if the auroras are strong. In reality however, the auroral ultraviolet light is probably too weak to expect to be able to observe fluorescence in even the brightest fluorescing specimens. Still, it is an experiment to try one wintery night if you are in Point Barrow, Alaska, and happen to have a good Sterling Hill willemite with you!

Ref: Strangeway, R. J., "How do auroras form?" *Physics Today*, p. 68-69, July 2008

Right vs. Left in Quartz

Quartz, as every mineral collector knows, has the chemical formula SiO_2, which is read as "silicon dioxide." This empirical formula means that, for every silicon atom in a quartz crystal, there are two oxygen atoms. Simple enough, but it doesn't tell us anything about how the atoms are arranged.

In quartz, each silicon atom is surrounded by four oxygen atoms in a tetrahedral arrangement. "Now wait one minute," you say, "you just told us that there are only two oxygen atoms for each silicon atom!" The one-to-two silicon-to-oxygen ratio applies to the entire crystal, but on the atomic level four oxygen atoms surround each silicon atom. Each of those oxygen atoms is shared by another silicon atom – each of the oxygen atoms forms the corner of two different silica tetrahedra. Thus, each silicon atom really only "owns" one-half of each of the four oxygen atoms. One-half each times four equals two and so the empirical formula is satisfied.

The shared corners of these silica tetrahedra are what hold the quartz crystal structure together – like a three-dimensional jigsaw puzzle. But unlike a jigsaw puzzle, there is more than one way to arrange the pieces (i.e. to connect the silica tetrahedra). In quartz, the silica tetrahedra are arranged in a spiral (or helix) around the c-axis (the c-axis is the long six-fold axis found in most natural quartz crystals). Think of them like spiral staircases. There are two ways to make spiral staircases: one can build them so they spiral up to the right or up to the left. Similarly, quartz can be made up of tetrahedra in left-handed or right-handed spirals. This results in "right-handed" or "left-handed" quartz.

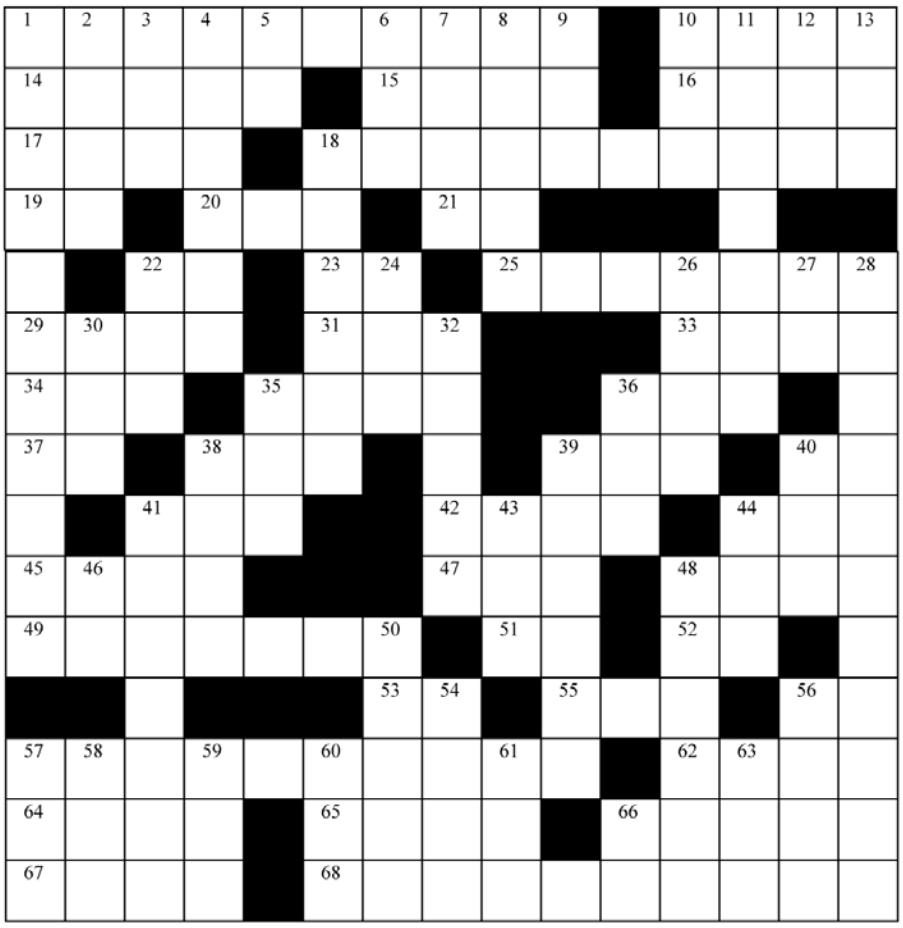
"That is all very fine and interesting," you say, "but, lacking X-ray vision, how do I tell one from the other?"

If a quartz crystal displays certain minor crystal faces, it is possible to easily tell left-handed from right-handed quartz. These minor faces occur at the edges between the side faces and the end or terminal faces of the crystal. Look at the crystal perpendicular to the c-axis. If the minor faces follow an upward spiral to the right, you have right-handed quartz; if they follow an upward spiral to the left, the quartz is left-handed. Checking out the quartz crystal diagrams in most mineralogy texts will help you distinguish left- from right-handed quartz. Unfortunately, most of the crystals you find in nature do not display the necessary minor faces, so it is difficult to determine the "handedness" of those quartzes. Still, handedness is a characteristic you should try to observe every time you collect a quartz crystal.

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. Write P. O. Box 10664, State College PA 16805 (814) 867-6263 or email* sicree@verizon.net *for more info.*

Crystal Matrix Crossword

Some Fossils



ACROSS
1 extinct three-lobed arthropod
10 shape of horn coral fossil
14 springs in desert regions
15 ____ Linda
16 chocolate cake dessert
17 multi-hulled boat
18 common shell fossils
19 original equipment (ab)
20 the way
21 dysprosium
22 you and I
23 state of Ruggles Mine
25 layer containing fossils
29 related to fossil sharks
31 rotate about vertical axis
33 not quite micro
34 Much __ About Nothing
35 state with lots of fossils
36 who Bugs always talks to
37 type of sandwich
38 girl's name
39 great bird
40 where Songo Pond is
41 ___ you dad
42 to close a mine shaft
44 Green River fossil fish
45 excited atoms
47 ___ Sack
48 Greek Earth goddess
49 fossil sea lily
51 halogen from sea
52 big coal state
53 optometrist's right eye
55 period of geologic time
56 drink with jam and bread
57 our current era
62 short Kristofer, Kristine
64 ____ as a bug
65 more time periods
66 layered quartz
67 what Charlie Chan says
68 two-shelled mollusk

DOWN
1 map used for fossil hunts
2 what Archaeopteryx is
3 on film
4 fossils from trees
5 osmium
6 not at all well
7 we thought you was a __
8 TV awards
9 Special Air Service
10 ___ Guevara
11 not fossil eggs
12 hockey league
13 Titan of the dawn
18 grand ditch
22 yellow stone state
24 what donkey says
26 to run crazy
27 international group
28 turned to stone (British)
30 adjust (ab)
32 thin waisted insects
35 what squid makes
36 how fossil was found
38 association
39 ____Hepburn
40 ___West – a lifejacket
41 can be found a fossils
43 where the scientists are
44 not a guy
46 upper left state
48 ancient fossil tree
50 gives fossil to museum
54 famous mineralogist
56 Yugo despot
57 sine ___ non
58 cavemen say this
59 Tokyo airport code
60 Confederate
61 Royal Shakespeare Co.
63 knock
66 art. intelligence

LAST MONTH'S SOLUTION: **Africa**

T	O	R	B	E	R	N	I	T	E	■	G	N	U	S
E	M	E	R	Y	■	A	D	I	T	■	F	I	A	T
R	A	M	A	■	M	A	L	A	C	H	I	T	E	S
M	N	■	Z	I	A	■	Y	R	■	■	■	R	■	■
I	■	V	I	■	L	A	■	A	C	A	C	I	A	S
N	A	I	L	■	A	B	S	■	■	■	A	T	M	O
A	D	Z	■	S	W	A	T	■	■	E	V	E	■	U
T	O	■	D	E	I	■	O	■	O	N	E	■	F	T
I	■	C	R	T	■	■	N	E	X	T	■	O	O	H
O	B	O	E	■	■	■	E	P	I	■	G	I	G	A
N	A	M	I	B	I	A	■	A	D	■	U	L	■	F
■	■	O	■	■	■	■	V	U	■	E	L	I	■	M	R
C	E	R	U	S	S	I	T	E	S	■	N	I	S	I
A	T	O	M	■	E	L	E	V	■	X	E	B	E	C
R	A	S	P	■	C	A	S	A	B	L	A	N	C	A

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.

Sept. 13-14; Gem, Mineral & Jewelry Show by Central Pennsylvania Rock & Mineral Club; Eagle View Middle School, 6746 Carlisle Pike, Mechanicsburg, PA. Educational displays and talks, Cub and Girl Scout activity pins and badges. Adults $5, children 12 and under free; Sat. 10-6, Sun. 10-5. www.rockandmineral.org

Sept. 24 - 28, 2008: AFMS and South Central Federation Convention and Show, Humble, TX. Show on Fri-Sun. www.amfed.org/show2008.htm

Sept 27-28: Franklin-Sterling Hill Mineral, Gem, and Jewelry Show, by FOMS and the Franklin Mineral Museum, at Franklin Borough School on Washington Avenue.

Oct. 4, 2008: Autumn Mineralfest by Pennsylvania Earth Science Association, Macungie Memorial Park, Macungie, PA. Sat. only, 8-3. www.mineralfest.com

Oct. 4, 2008: Walkway Through Our Past event, by Mineralogical Soc. of NE Pa. & others. Wide variety of activities on local history & environment, including Knox Mine Disaster Site tour, fluorescent mineral display, gem cutting. Free admission & parking. Pittston Riverfront Park, Kennedy Blvd, Pittston PA. Sat. only, 10-5.

Oct. 11-12 Kit-Han-Ne Rock & Gem Club Show, West Franklin Firehall, corner of Cherry and Linton St., Worthington, PA. Six vendors, silent auction, displays, Gem Mine for young and old, Plinko for kids. Sat. 10-6, Sun. 10-5. www.facetersco-op.com/zabinski/gemshow.htm

Oct 25: South Penn Rock Swap, by CPRMC and Franklin County RMC, South Mountain Fairgrounds , 1.5 miles west of Arendtsville, PA on Rt 234. Sat. only, 8-3.

Oct 25: "Ultraviolation 2008" Fluorescent mineral show, by Rock & Mineral Club of Lower Bucks County, PA; First United Methodist Church, 840 Trenton Rd, Fairless Hills, PA; Sat. only, 9-4.

Nov. 1 - 2, 2008: Gemarama, by Tuscarora Lapidary Soc.. The School at Church Farm, Exton, PA. North side of Bus. Rte. 30, off Rte. 202, 0.5 mile west of Frazer. "Gemstones of South America" theme ; dealers, finished jewelry, cut and uncut stones, fossils, beads, tools, demonstrations, jewelry artistry, exhibits, children's activities, door prizes. Sat. 10-6, Sun. 10-5 www.lapidary.org ❄

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!

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

David Glick (President) 237-1094 (h) xidg@verizon.net
Dr. Bob Altamura (Vice-President) 814-234-5011 (h)
e-mail: raltamur@fccj.edu
John Passaneau (Treasurer) 814-863-4297 (o),
e-mail: jxp16@psu.edu
Frank Kowalczyk (Secretary) 238-8874 (h, 8-9 p.m.)
e-mail: fjk12@scasd.org

OTHER CONTACTS

Field Trips: Ed Echler 814-222-2642
e-mail preferred [2008]: eechler@comcast.net
Junior Rockhounds: Dr. Andrew Sicree 867-6263 (h)
e-mail: sicree@verizon.net
Membership Chair: David Glick (see above)
Programs: Dr. Duff Gold 865-7261(o), 238-3377(h)
e-mail: gold@ems.psu.edu
Publicity: Volunteers needed

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:

David Glick E-mail: xidg@verizon.net
209 Spring Lea Dr. phone: (814) 237-1094 (h)
State College, PA 16801-7226

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.