

Nittany Mineralogical Society Bulletin

Nittany Mineralogical Society, Inc.

P.O. Box 10664

State College PA 16805

Editor (see page 8):

April, 2015

Visit our web site: www.nittanymineral.org

David C. Glick

April 15th meeting:

Environmental Hazards of WWII Anthracite Coal Mining

by

Dr. Barry Scheetz
Penn State

Our April meeting will be held Wednesday the 15th in room 114 (large auditorium) of Earth & Engineering Sciences Building on the west side of the Penn State campus in State College, PA. Maps are available on our web site.

6:30 to 7:30 p.m.: Social hour, refreshments in the lobby

7:30 to 8:00 p.m.: announcements, questions, answers

about 8:00 p.m.: featured program

*The event has free admission, free parking, free refreshments, and is open to all; **parents/guardians must provide supervision of minors.** Bring your friends and share an interesting evening!*

During the all-out war effort of World War II, Pennsylvania was called upon to supply a large proportion of the energy for this effort in the form of coal. Coal was mined where ever it was available and because of the circumstances at the time it was done without any concerns for the environmental consequences. The result is a legacy that continues to this day of in excess of 250,000 acres of impaired land and some 50 miles of impacted streams and rivers; most of which go relatively unnoticed by the public. Pennsylvania records between 1 and 3 deaths a year that can be attributed to these earlier mining activities.

ATTENDING THE APRIL MEETING?

Donations of labeled **door prize specimens** are invited.

Your donated snacks and drinks will be welcomed.

Bring a friend!

Minerals Junior Education Day - April 11

by

David Glick, NMS President

Our annual Minerals Junior Education Day is happening this weekend, so watch for a report in the next issue.

Sign-ups have been low, so if you get this Bulletin before the weekend and know someone with kids who hasn't signed up, please refer them to the web site at www.nittanymineral.org

This year we'll have nine stations (plus a sales booth):

Gold panning	Fossil shells
Bedrock geology of PA	Gemstones
Fluorescence	Meteorites
Fossil bones	Sphere making
Mineral cleavage & structure	

The event will be held at the same location as last year:
Central Pa. Institute of Science & Technology
540 North Harrison Rd
Pleasant Gap, PA 16823

Pennsylvania Geology Magazine Vol. 44, No. 4 Now Available

The cover of the latest issue of Pennsylvania Geology, available on the PA Geologic Survey's web site at (Or through a link on our web site) shows our own Dr. Duff Gold, and Ordovician ripples and mudcracks at Hanson Brothers Oak Hall quarry near State College, in a photograph taken by our own Charles Miller.

John Barnes and Robert C. Smith, II, provide an illustrated article on *Mineralogy at the Pennsylvania Geological Survey - 1973 Versus Now*. The contributions of three geologists with long and productive careers in Pennsylvania are addressed by their colleagues in extensive In Memoriam articles : Rodger T. Faill (1936-2014), Albert D. Glover (1928-2014), and Richard P. Nickelsen (1925-2014).

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. We present brief summaries here in order to encourage readers to see the entire newsletters.

The **EFMLS Newsletter** is available through the link on our web site www.nittanymineral.org, or remind Dave Glick to bring a printed copy to a meeting for you to see. The April issue (not available on the web site yet) safety article discusses the positives in safety - even when there's a safety incident - and the positive aspects of every event or collecting trip that's completed without an incident. Alice Charbonnier is introduced as our new AFMS Scholarship Coordinator. Betsy Oberheim invites us to think about nominations for the Each One Teach One award next year. Scott Peters (Conservation & Legislation Chair) provides food for thought with his April First article "The Mischief Maker's Guide: How to Collect Great Specimens and Close Collecting Sites." Club Rockhounds of the Year are announced and honored, and more nominees for that award are invited. Wildacres Workshops are discussed, including the bulletin contest for a club to win a scholarship, and a registration form is included. The Historian's column discusses early mineral collecting in the American colonies and the young United States (the March column is reprinted in this Bulletin).

The **AFMS Newsletter** is available by the same methods. The April issue begins with color illustrations of several items newly donated for the Endowment Fund drawing at the convention in Austin, Texas, on October 24. President Marion Roberts says goodbye to winter, and discusses club bulletins and web sites. AFMS Club Rockhounds are introduced. Jim Brace-Thompson reviews two more books for young rockhounds. Endowment Fund drawing tickets are available, \$5 each or 5 for \$20. A note from ALAA reports how politics puts items into bills which effectively are not debated, with huge effects on the public's use of public lands.

Please see the web sites for the complete Newsletters. There's a lot there!

- Editor

Fall Wildacres - August 24 - 30

by Steve Weinberger
from "Has Your Club Entered the Contest?"
EFMLS News, April 2015

Let's look ahead to our August 24- 30 session.

Denise Nelson will be our Speaker-in-Residence and has already planned the six talks she'll give for us. She has also volunteered to do one of our sharing programs on Activity Day! If you've never heard her speak before, you're in for a real treat.

Each session at Wildacres is divided into two "semesters". Classes that are just 2-days in length are given either the first or second "semester". Classes that run 4 days continue for the entire week. You select your choices and our registrar Pamm Bryant makes every effort to assign you to your first choice per "semester".

Classes being offered this August are:

4-day Classes:

Faceting - Steve Weinberger
Gem Identification - Jay Bowman
Intarsia - Richard Shackleton
Polymer Clay - Barbara McGuire

2-day Classes (first semester):

Roadside Geology & Photography - Virginia Meador
Basic Silversmithing - Richard Meszler
Soapstone Carving - Sandy Cline

2-day Classes (second semester):

Intermediate Silversmithing - Richard Meszler
Soapstone Carving - Sandy Cline
Wildacres "Wild" - Virginia Meador

Full descriptions of each class can be found at efmls-wildacres.org. A registration form is on page 8 of this issue.

I'm looking forward to receiving your contest entries and to seeing you and your clubmates "on the mountain" this August.



A scrumptious luncheon is served in the Dining Hall. *From A Pictorial Tour of Wildacres, <http://www.amfed.org/efmls/wildacrespics.htm>*

JAMES L. MACIE

by Andy B. Celmer, EFMLS
Historian

from EFMLS Newsletter 52:5,
March, 2015



Hello Seekers,

Last month I spoke to you of the mineral collections of the 17th and 18th centuries. This might lead you to believe I am done with those centuries, *au contraire mon frère!* As the dog barked to the mailman, "I have not yet begun to bite!"

James Louis Macie is born in Paris in 1765 to Elizabeth Hungerford Keate Macie. He is the illegitimate son of Hugh



Smithson Percy, first Duke of Northumberland. James Macie studies chemistry and mineralogy at Pembroke College, Oxford, England. As a member of the wealthy class, James Macie field collects extensively and develops his skills with mineral analytical experimentation. James will change his surname to Smithson in 1801 and in 1802 publishes a paper which identifies zinc

carbonate as "calamine," not zinc oxide as thought by Häuy. Zinc carbonate will later be named smithsonite in his honor.

James Smithson is quite wealthy when he dies in 1829, leaving most of his estate to his nephew, with the provision that if the nephew dies childless the estate would go — to the United States of America, to found at Washington, under the name of the Smithsonian Institution, an establishment for the increase and diffusion of knowledge among men.

God, I love that kind of talk!

You know the nephew, Henry James Hungerford, will die childless because there exists the greatest museum system in this country (author's opinion), called the Smithsonian Institution.

The James Smithson estate included \$550,000, 105 bags of 1,000 gold sovereigns each and 8,000 to 10,000 mineral specimens described and labeled in Smithson's own writing, along with his papers and other effects.

But not so fast readers! When it came to creating this great institution, "ya got trouble, right here in River City! With a capital "T" and that rhymes with "P" and stands for Pool!" I know that doesn't rhyme with S.I. but what can I do? Suffice it to say that this young nation is wet behind the ears. This new nation is a tad bit insecure when dealing with its older, more experienced European neighbors. Anyway, River City in this case is Washington, DC and President Andrew Jackson, (his friends called him Andy B), is unsure if he has the power to accept the gift. So he will ask congress to give him said power. Senator John C Calhoun (South Carolina), believes it will abridge States' rights to accept the gift and Senator William Campbell Preston (South Carolina), says, "[E]very whippersnapper vagabond...might think it proper to have his name distinguished in the same way." The bill will pass in its own good time. As they say of Congress, "how long does it take to pass a bill?" Reply, "three months." "What if it's an emergency?" Reply, "four months!"

The Smithsonian Institution exterior is completed in 1849 and the Smithson collection is soon installed and we all live happily ever after. "But wait Andy B," both of my readers ask, "why do we not see at least some of James Smithson's minerals on display?" Funny you should ask.

January 24, 1865 is another cold day in the nation's capital. A few days prior a stove is installed in the picture gallery. Inadvertently the exhaust from said stove is inserted into an air chamber in the wall instead of the flue. A fire consumes the third floor along with Smithson's mineral collection and most of his papers. Two hundred oil paintings by John Mix Stanley are lost as well as the contents of the public libraries of Alexandria, Virginia and Beaufort, South Carolina. Thus depriving the nation of the knowledge of James Smithson as a great mineral collector!

Smithsonian Regent Alexander Graham Bell brings James Smithson's remains to Washington DC and they are interred in a tomb in the Smithsonian Building. Next time you are in the nation's capital, stop by and visit, he loves the company.



They Got It Wrong

by
Charles E Miller, Jr.
Images by the author

Jacks Mountain

Jack's Mountain, located in Huntingdon County, is site of the popular "Thousand Steps" hiking trail along Rt. 522 near Mapleton, PA. One description states that petrified wood is abundant along the trail, in part because it was exposed by past mining on the mountainside.



Figure 1. Scree slope on Jacks Mountain

The mountainside scree (Fig. 1) is of Silurian Tuscarora Quartzite. This formation is one of the ridge-formers in Pennsylvania because of its resistance to weathering. Fossils in the Tuscarora are few and mostly ichnofossils (trace fossils) consisting of worm burrows (Fig. 2). *Arthropycus* is the ichnofossil most commonly associated with the Tuscarora. There is no petrified wood along this trail. Trees did not appear in the geological record until the Devonian - after the Silurian. Ergo, one would not expect petrified wood associated with the Tuscarora. Perhaps, if the mountaintop included younger formations, then petrified wood might be possible. However, such is not the case. It is not clear what is mistakenly identified as petrified wood.



Figure 2. *Arthropycus*

The fact that mining occurred on this mountain is a minor reason for seeing the fossils. Mining is not responsible for breaking up most of the rock. Instead, the responsible geologic agent is ice wedging (a form of physical weathering). The broken rocks provide many more surface areas on which fossils can be seen. In addition, scree slopes usually have little or no soil cover. Absence of soil enables one to see the fossils more easily. This is true for all other scree slopes in central Pennsylvania involving the Tuscarora - despite absence of mining there. In Pennsylvania, the scree slopes/boulder fields are the result of periglacial (tundra-like) conditions that existed during the Pleistocene Ice Age. Ice wedging was much more common at that time than today due to colder temperatures. Freezing water is very efficient in breaking rock because it can exert pressures up to 9 T/in².

The gully that the "Thousand Steps" hiking trail traverses through is not "a glacially carved cirque from the last Ice Age." Cirques are steep-sided, bowl-shaped recesses or depressions high on mountainsides and formed from a combination of physical weathering and glacial erosion (Fig. 3). There were no glaciers this far south. The gully is bowl-shaped but not due to glaciers and, therefore, is not a cirque.



Figure 3. Two glacial cirques, Banff National Park, Canada

A television story

A recent story about Luray Caverns aired on a television channel. This beautifully decorated commercial cave at Luray, Virginia, is a National Natural Landmark. Approximately 500,000 tourists visit it each year to witness its grandeur.

The program erroneously reported that Luray Caverns is 400 million years old. The cave is in Ordovician Beekmantown Limestone (488-444 million years ago) but the cave, itself, is no older than about 3.5 million years (Pliocene to Pleistocene age). Solution caves are almost always significantly younger than the formation(s) in which they form. Exceptions involve special geological circumstances, none of which apply to Luray Caverns.



Figure 4. Luray Caverns, Virginia

A College Chemistry Textbook

A college chemistry textbook included a series of photographs showing pyrite, calcite, selenite, and quartz. The accompanying caption read: “Cleavage planes are most evident in large crystals such as calcite and quartz.” This egregious error confuses quartz crystal faces for cleavage planes. Quartz has no cleavage. Cleavage is the breaking of a mineral along its crystallographic planes, thus reflecting crystal structure. The cleavage planes in minerals occur when atomic bonds are relatively weak in specific directions. An important point in the definition of mineral cleavage is that it is how a mineral breaks, not how it looks in crystal form. Crystal quartz forms as six-sided crystals. However, it breaks along irregular surfaces called fracture. Unlike cleavage, fracture has no predictable breakage planes. Glass breaks with fracture.

Water can’t flow uphill

Pennsylvania Department of Environmental Protection’s Bureau of Mining and Reclamation conducts hydrogeologic investigations related to coal and non-coal surface mines. These commonly involve interactions with private citizens. On occasion, a citizen proclaims: “As you know, water still can’t flow uphill.”

Water flows from high potential to low potential. Water can flow uphill if it is driven by a change in potential energy (hydraulic head) and is obstructed from moving in other directions. Several examples demonstrate this: (1) Artesian wells flow to the surface without pumping. These are drilled into confined aquifers containing groundwater under positive pressure. Because they flow to the surface, they flow uphill or counter to gravity. (2) Oil and gas wells commonly have initial flows that require no pumping. Both are under pressure from the weight of overlying strata. Well gushers or blowouts are uncontrolled release of oil and gas that have explosively risen to the surface because they are under pressure. In these instances, oil and gas act the same as water by flowing “uphill” or counter to gravity. (3) Abandoned, deep (underground) bituminous coal mine roofs collapse, causing surface fractures through which water infiltrates. The underground mine becomes an aquifer (water-bearing zone). If roof collapse occurs, fallen rocks and debris may dam the water. The impounded water can easily reach enough head causing it to reverse and flow up dip (uphill). Eventually the water will either break through the impoundment or reroute to another tunnel and resume more normal down-dip flow. (4) A classic example of water flowing “up hill” was one the author witnessed during Hurricane Agnes in 1972. Storm sewers were flowing at full capacity due to the excessive rain. Observed was water rising out of a manhole cover to a height of about two feet. The storm sewer acted as a confined aquifer. Enough head at a higher level allowed water to rise above the manhole cover.

Devil’s Race Course (Raven Rock Hollow)

In 1974 an interesting article appeared in a Pennsylvania newspaper. The article described the Devil’s Race Course (Fig. 5), a geological feature in South Mountain near Waynesboro, in the following way: “...seldom do we find so classic an example of the results of moving glaciers and their force.” While the article was informative and interesting, it was also incorrect.



Figure 5. Devil’s Race Course

Devil’s Race Course is a relict block stream – a linear collection of boulders occupying a stream valley. The boulders cover the stream flowing below. This feature has no connection to glaciers other than the climate in which both existed. There were no glaciers this far south. The closest glaciers during the Pleistocene terminated near Williamsport, Pennsylvania. The Devil’s Race Course formed under periglacial (tundra-like) conditions during the Ice Age. Ice wedging is the geologic agent primarily responsible for breaking rock into boulders. Boulders initially accumulated on slopes above the present-day stream valley that Devil’s Race Course occupies. Solifluction – imperceptibly slow, downslope flow of water-saturated regolith – moved the boulders to their current position in the stream valley. Any soil originally with the boulders has been washed away.

Limestone purifying water

When I was young, I was told that water in a limestone quarry was clear because limestone purifies the water. Later, trained in geology, I reflected back on that earlier comment and realized it had no validity.

In this discussion, “purifying” refers to bacteria in the water. However, it could also refer to transparency or clarity of the water. Carbonates (limestone and dolomite) have no special qualities, chemical or otherwise, for purifying water. Some limestone quarries are essentially slime ponds.

In fact, in one common geologic setting – karst topography – a feature of carbonates is conducive to groundwater bacterial contamination and to discoloration from silt. Karst topography, or karst, refers to carbonate areas where surface water is largely diverted underground (Fig. 6). Common features of karst include: sinkholes, sinking creeks,

caves, karst springs, terra rosa, lapies, and natural bridges. Much of Nittany Valley is karst. Carbonate rocks in karst contain solution channels (Fig. 7) These are natural conduits formed from solution. They are caves ranging up to 7-8+ feet in diameter and can convey copious volumes of water. Essentially, they act as pipes. As a result, little or no natural

filtration occurs that, ordinarily, removes bacteria and silt. It is for this reason that using sinkholes as garbage disposals is a bad practice. Sinkholes drain into solution channels and eventually into the water table.



Figure 7.

Pools of oil

When people talk about oil and gas reservoirs, many think of underground pools or lakes. The petroleum companies foster this idea by referring to “pools of oil.” This is especially interesting in view of all the information available regarding Marcellus Shale drilling. Indeed, some advocates wanting to ban Marcellus hydrofracturing may share this misconception despite it being a basic tenet of petroleum geology. Such large pools or lakes of oil and gas do not exist. The hydrocarbons occur in pores and fractures in solid rock. This explains why only about 60 percent of the hydrocarbons in a reservoir can be extracted, even after secondary and tertiary recovery. This means 40 percent of the hydrocarbons are left behind. If oil and gas did, indeed, occur in huge lakes or pools, virtually all of their volume could be extracted.



Figure 6. Unnamed tributary near Water Street, Huntingdon County, PA.

Geo-Sudoku

by David Glick

This puzzle contains the letters ACEGILNRS, and one row or column includes the ice age agent which was **not** responsible for every expanse of boulders in the state. Each block of 9 squares, each row, and each column must contain each of the nine letters exactly once. The solution is on page 8.

		N		C				A
				E	N		I	R
E						C		
N	E	S	G		A		C	
	L		C		E	R		
	C	I	S					E
	N	C	R		I	A		
		E		G				
I				A				S

Classifieds

Ads may be submitted to the Editor (see p. 8)

FOR SALE: This sturdy, three-legged cast aluminum lapidary unit is made by Gemlap Equipment, model 5-A. Its



tub is 4 inches deep, and will hold any grinding wheel or platen up to 2-inches thick and 10 inches in diameter. Its center ball bearing mounted spindle is 0.5 inches in diameter, with a 0.5-20 UNF fine thread (20 threads per inch.). It is driven from below by any conventional pulley system. Old

but in excellent condition. \$25; proceeds go to NMS. Contact Jim Garthe, jwg10@psu.edu, (814) 667-2409.

FOR SALE: Long-time Pennsylvania collector John 'Pen' Ambler in Hollidaysburg has books, specimens and more for sale. Pen reports: "I have some 10 – 15 cartons of books on minerals and mineral related subjects. My cataloged collection consist of upwards of 6,000 specimens some of which were the Ed Carper collection. The specimens are cabinet, small cabinet, hand-sized, miniature, thumbnail and micro minerals. Many of the minerals are PA and eastern U.S.; however, it is a varied collection. There are lapidary materials (slabs and some bulk); limited fossils; tumbled stones including PA amethyst; UV materials and equipment; supplies (boxes, etc.)." Please contact Pen by email: bridger@atlanticbb.net

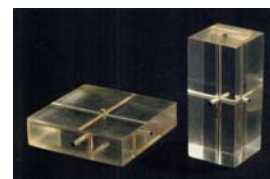
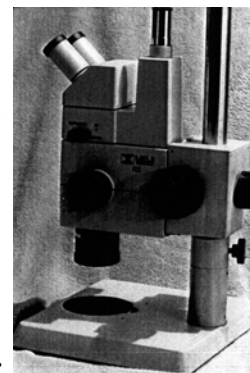
FOR SALE: 2 Homemade Lapidary saws for sale - 14" and 18". Both come with working motors, arbor, belt, pulley, rock clamp/carriage, and a blade. Both are mucked-out and ready to move. Both could use a little TLC. For more info contact Mike Zelazny at fabricatefilm@yahoo.com

FOR SALE:
Microscope & Accessories, Mineral Specimens, Crystal Models.

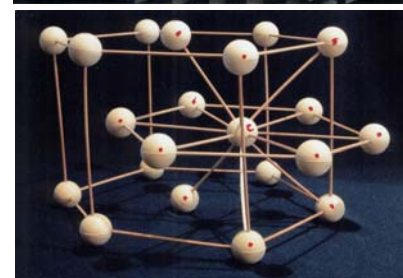
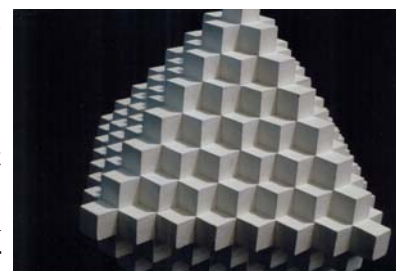
Avid collector wants these to be purchased by someone who would appreciate them. Contact Frank & Gail Beall, 724-789-7290. See much more complete listing at

www.nittanymineral.org/beall.pdf

Crystal Models: Plexiglas, wood, cast acrylic, ball-and-stick, folded paper. These are excellent teaching materials for understanding basic crystallography. They would be very useful to a club, providing "hands-on" teaching materials to bring a difficult subject to understanding. The models were hand-made, taking much work to make accurate 3-dimensional representations of things illustrated in mineralogical books and articles. There is a lot to learn by having a model that you can hold in your hand - it's easier than trying to envision the structure from a drawing! These are invaluable to seeing relationships in crystals - especially those that exhibit more than one form simultaneously, as most crystals do. I have examples in my pyrite collection, for instance, which exhibit as many as 5 forms in one specimen! It would have been difficult to identify the forms involved if I hadn't the paper "origami" models, showing the Miller indices on the faces, as a reference.



The ball-and-stick models reveal secrets, too. Why does a diamond cleave the way it does? Why are there "holes" in quartz that could contain ions to cause its different colors? Many things can be demonstrated with the molecular models.



Some Upcoming Shows and Meetings

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

See www.mineralevents.com for more.

April 18-19, 2015: North Museum Rock, Mineral & Fossil Show, by North Museum of Natural History & Science. Farm & Home Center, 1383 Arcadia Rd. Lancaster PA. Sat 10-5, Sun 10-4. Vendors, doors prizes, children’s activities, identification tables. Food, free parking. Educational demonstrations and speakers including:

- Fossils of the White River Formation – Bill Palmer
 - Gap Nickel Mine – Dale Chadwick
 - Crystal Formations – Dr. Stephen Kirsch
- <http://www.northmuseum.org/event/gem-mineral-show/>

May 2-3, 2015: Treasures of the Earth 2015, Annual Show & Sale by The Mineralogical Society of Northeastern Pennsylvania. Oblates of St. Joseph, 1880 Hwy 315, Pittston PA 18640. Sat 10-5, Sun 10-4.

May 9, 2015: South Penn Spring Rock Swap— South Mountain Fairgrounds-1.5 miles West of Arendtsville, PA on Route 234. Sat. only, 8:00 a.m.- 3:00 p.m.

May 16-17, 2015: World of Gems and Minerals Show, by Berks Mineralogical Soc. Leesport Farmer’s Market, Route 61, Leesport, PA.

June 6, 2015: Spring Mineralfest, by Penna. Earth Sciences Ass’n. Macungie Memorial Park, Poplar St., Macungie PA. Sat. only, 8:30-3:00.

Geo-Sudoku Solution

L	S	N	I	C	R	E	G	A
C	A	G	L	E	N	S	I	R
E	I	R	A	S	G	C	N	L
N	E	S	G	R	A	L	C	I
G	L	A	C	I	E	R	S	N
R	C	I	S	N	L	G	A	E
S	N	C	R	L	I	A	E	G
A	R	E	N	G	S	I	L	C
I	G	L	E	A	C	N	R	S

INVITE A FRIEND TO JOIN THE SOCIETY

The Nittany Mineralogical Society prides itself on having among the finest line-up of speakers of any earth sciences club in the nation. Everyone is welcome at our meetings. 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). Those joining in March or later may request pro-rated dues. Your dues are used for programs and speakers, refreshments, educational activities, Bulletins, and mailing expenses. Please fill out a membership form (available at www.nittanymineral.org), make checks payable to “Nittany Mineralogical Society, Inc.” and send them in as directed, or bring your dues to the next meeting.

We want to welcome you!

SOCIETY OFFICERS

David Glick (President) 814-237-1094 (h)
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Dr. Bob Altamura (Vice-President) 814-234-5011 (h)
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Ellen Bingham (Secretary)
e-mail: emb22@psu.edu

Stuart Bingham (Treasurer)
E-mail: sebing145@comcast.net

OTHER CONTACTS

Field Trips: Ed Echler 814-222-2642
e-mail preferred: eechler@comcast.net

Junior Rockhounds: Dr. Andrew Sicree
814-867-6263 (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

Door Prizes: *volunteer needed!*

Refreshments: *volunteer needed!*

Facebook & Publicity: John Dziak: jjd264@psu.edu

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 name of photographer or artist.