Nittany Mineralogical Society Bulletin

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

December, 2013

Visit our web site: **www.nittanymineral.org**

Editor (see page 8):
David C. Glick

December 18th meeting:

Holiday Potluck Dinner at the Binghams' Pennsylvania Furnace, PA

Junior Rockhounds Meetings are on hold until January. Please watch for news then...
Please come to the holiday dinner!

Nittany Mineralogical Society

Annual Holiday Potluck

Wednesday, December 18th, 2013

Five in the afternoon for cocktails

Six in the evening for dinner and dessert after

Hosted by Stu and Ellen Bingham at their holiday home

six miles from PSU campus

145 Goddard Circle, Pa Furnace, PA 16865

RSVP up to one day before: 814-234-4532 or **emb22@psu.edu**

We will supply the place setting, the decorations,

and non-alcoholic beverages such as

our PG-13 Singapore sling, tea, coffee, and plenty of ice. **You bring the rest!**

For transport from town contact us!

Dues are Overdue!

by David Glick, NMS President

Our membership year ended on October 31, so if you haven't paid yet, please do so! We don't want to lose you! The rate remains at $20 for an individual member, with other options available. Forms may be downloaded from our web site, and forms and payment can be brought to the December 18th dinner or mailed in.

The dues form includes a line for "don't send a printed Bulletin." If you read the Bulletin on the web site anyway, you can help reduce our printing and mailing expenses by checking this line. You can go back to the printed version, or request individual printed issues, at any time.

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 December issue encourages submission of club bulletins and individual articles for the Bulletin Editors' contest. President Hazel Remaley's featured committee this month is the federation Historian. Club Rockhound of the Year nominees are invited, as are donations to the Eastern Foundation Fund. Registration for the Spring session of Wildacres Workshops (April 7-3) will open after January 1. Class descriptions are provided. The Spring Speaker-in-Residence will be Leonard Himes, "well known mineral dealer (Minerals America and Graeber and Himes). Leonard is a native Floridian and retired chemistry teacher. Recognized nationally for excellence in teaching, he coached the US team in the International Chemistry Olympiad (his students did very well!)." The safety article reminds us to **think** first about safety - not let our passion for collecting a great specimen make us forget about safety. The Junior Activities article proposes a Mineral Lyceum for those juniors most deeply interested in mineralogy.

The **AFMS Newsletter** is available by the same methods. The December - January issue announces the 2014 seminar for training judges of competitive mineral displays, to be held April 10-14, 2014, in Ogden, Utah. The 2014 Endowment Drawing publicity kicks off with photos of the first six prizes which have been donated - minerals, fossils and more. President Richard Jaeger writes about communication within clubs, and between clubs and federations. Jim Brace-Thompson's column on Junior Activities encourages adults in our clubs to make the commitment to help with juniors' activities; "capitalize on your existing pool of talent." Dr. Mike Nelson, new Chair of the Conservation and Legislation Committee, summarizes some regulations on types and amounts of materials which may be collected from different public lands, such as the U.S. Forest Service, Bureau of Land Management, and some of their specially administered land categories. Club Rockhounds of the Year are announced, and Jon Spunagle provides an article on tax status for clubs. Some upcoming ALAA events are announced.

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

Geo-Sudoku

by David Glick

This puzzle contains the letters AEHILNOST, and one row or column spells out a natural material made of concentric layers. 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.

				I	T	O		H
					L			A
	O			E	A		L	
A		I	E			N		
O	N			T	I		H	S
	S				N		I	
I	A		H			L		O
		O					S	
N	H		T					

Twenty Years Ago: pre-NMS

Twenty years ago, in December 1993, the formation of a new mineral club was being discussed by several collectors in the State College area. Please plan to attend the January 2014 meeting, when we will look back over 20 years of the Nittany Mineralogical Society and a bit of the early years and earlier clubs.

A 1997 Nittany Mineralogical Society field trip, photo courtesy of A. Sicree

The Twilight Zone, the teacher, and the professor

Charles E. Miller, Jr.
Geologist

Educators have a unique role as purveyors of knowledge. Their impact on students cannot be completely quantified. Students can be graded on exams and projects that, in part, reflect their mastery of what they learned. Certainly an educator feels rewarded when students do well. However, one of the most personal rewards is when an erstwhile student tells how that educator impacted them. For example, there is the geology professor who had a graduate student take a course in remedial English. That professor retains a letter from the student, written post graduation. The letter expresses gratitude for the mentoring, in general, and for the remedial course, in particular.

This is the story of *The Twilight Zone*, a high-school earth-science teacher, and a college geology professor. *The Twilight Zone* aired from 1959 to 1964, providing stories of science fiction and fantasy. In 2013, the Writers Guild of America ranked it as the third best-written TV series ever. In 1971 an earth-science teacher was completing first-year teaching at Boiling Springs (PA) High School. At the same time, at nearby Dickinson College in Carlisle, Professor Henry Hanson was teaching geology at Dickinson College.

On 6-1-62 an episode of *The Twilight Zone*, "The Changing of the Guard," aired on television. Preparing to leave for Christmas vacation, Professor Fowler is informed by the headmaster that, after fifty-one years of teaching, he is to be forcibly retired. Fowler is devastated by his news and begins to brood. He says to his housekeeper: "I gave them nothing, I gave them nothing at all. Poetry that left their minds the minute they themselves left. Aged slogans that were out of date when I taught them. Quotations that were dear to me that were meaningless to them. I was a failure, Mrs. Landers, an abject, miserable failure. I walked from class to class an old relic, teaching by rote to unhearing ears, unwilling heads. I was an abject, dismal failure—I moved nobody. I motivated nobody. I left no imprint on anybody." That evening, having decided his teaching has accomplished nothing, he takes a pistol and walks back to the school, determined to commit suicide. Suddenly, he hears a school bell. He enters a classroom--and sees the apparitions of a number of his now-deceased students materialize. They are there for a purpose: to convince him that his lessons helped them to go on and commit acts of bravery, to sustain high levels of ethics, etc. Fowler returns home, satisfied that he has made some mark in the world--and content now to retire.

In October of 1991, the former earth-science teacher attended the Field Conference of Pennsylvania Geologists. During one day, attendees were just beginning lunch at a park. The former teacher randomly sat down at a picnic table. A nametag on the other side of the table read "Henry Hanson, Dickinson College." The two exchanged introductions. The former teacher asked Henry if he would be interested in a story. "Please do." was the reply. The story went something like this. Twenty years earlier, the former teacher was finishing a first year of high-school earth-science teaching at Boiling Springs High School. In the spring, Henry was guest speaker, presenting geology of the Cumberland Valley. Henry dressed in khaki field clothes and carried a backpack. In the backpack was a piece of local limestone riddled with solution channels. He explained solution channels lead to unfiltered groundwater, sometimes resulting in contamination. Such flow also creates sinkholes, common in the valley. Henry's slide show included pinnacle weathering in limestone along I-81, aerial views of the Cumberland Valley, and sinkholes. The teacher was most impressed. Particularly interesting was the piece of limestone riddled with solution channels. The teacher had to have one like it. In ensuing months, the teacher walked farmers' rock piles in the valley, looking for a piece of local limestone equal to the one Professor Hanson had used in class. The teacher failed in that goal. Nothing equaled the one Henry had shown. However, numerous "lesser-quality" examples were found. As it turns out, these served the teacher well in later geological pursuits. The former teacher, then, finished the story, hoping that appreciation and impact had been conveyed. There was a pause..……and, then, Henry said: "You can't believe how good that makes me feel."

Henry died about a year later.

The writer was that impressionable first-year high-school earth-science teacher. Henry Hanson was Professor Fowler – not the abject failure, but the educator who made a significant impact.

Local Geological History and Chambersburg's Limestone Buildings[1]

by
Charles E. Miller, Jr., Retired geologist

Introduction

Chambersburg is located in one of four major limestone areas of the country. Over 13,000 feet of limestone is in the Cumberland Valley[2, 3], where it has been quarried since at least the mid- to late-1880s[4], and probably earlier. One early limestone quarry, thought to be located near present-day South Gate Mall, is shown in Figure 1. It dates to at least 1909.[5] Varying quality of local limestone offers many different uses, including as building stone. Local limestone farmhouses dating back to the 1800s attest to durability of the rock.[6]

Chambersburg is rich in natural-stone buildings and ancillary structures. The types of stones are as varied as their uses. Particularly interesting are the limestones and dolomites. Nearly identical in appearance, both are herein called limestone. They are aesthetically appealing and the basis of an interesting geological story.

A survey of 34 buildings and structures (Table 1) in Chambersburg shows limestone of two general types: Indiana (Salem) Limestone imported from Indiana and local limestone. The former is used in 14 of the 35 buildings surveyed. Some of the best examples are columns to the Coyle Free Library, main entrance steps of the Old Jail, cornerstone of Disert Hall at Wilson College, and front steps and entryway of the Chambersburg Baptist Church. Indiana Limestone is probably better known for being extensively used in the Empire State Building, The Pentagon, the original Yankee Stadium, Lincoln Memorial, and Rockefeller Center. This limestone looks like fine-grained Portland cement, with which it competes for being one of the most widely used building materials. Upon close inspection, however, the two can be differentiated. Unlike Portland cement, Indiana limestone is bioclastic – made of small fossil fragments.[7,8]

Figure 1: Limestone quarry in Chambersburg. Note the person standing in the quarry. (Stose, 1909)

Table 1. Buildings and ancillary structures using limestone; Chambersburg, PA

Franklin County Courthouse
Falling Spring Church
Private residence: 245 E. King St.
Old Franklin County Jail
Stonewall behind former Sears & Roebuck site on Second St.
"Repair" building @ former Sears &Roebuck site
Dan Snyder's barbershop
Trinity Episcopal Church
Trinity Evangelical Lutheran Church
Former office of Donald Glen, DDS
King Street bridge
South Hall of Wilson College
Riddle Hall of Wilson College
Laird Hall of Wilson College
Prentis Hall of Wilson College
Disert Hall of Wilson College
Rosencrans Hall of Wilson College
St. Paul United Methodist Church
Geo. Washington Lodge # 143 wall
Old Shook Home for the Aged wall
Private residence: 273 Lincoln Way E.
Storage building off 16 Spring St.
Storage building @ Hood & King Streets
Storage building off Wayne Ave.
Chambersburg Engineering Co. wall along US 11
Central Junior High School
Corpus Christi Church
Corpus Christi School
Robert G. Sellers Funeral Home
United Telephone System Building @ 250 Lincoln Way East
Chambersburg Hospital
Chambersburg Baptist Church @ 588 S. Second St.
Washington House Hotel @ 204 Lincoln Way East

The most common natural stone in Chambersburg's buildings is local limestone. Of special interest is fossiliferous (fossil-bearing) limestone. Examples may also show sedimentary features formed before the lime sediment lithified (turned to rock). Together, fossils and sedimentary features in the limestone provide clues to their formation and to local geological history.

Clues from the rocks

Geology is a detective story. It attempts to answer questions about Earth. One such question is: "What is the origin of the 13,000 feet of limestone in the Chambersburg area?" Clues are in the rocks. Chambersburg's limestone buildings provide easy opportunities to see many of those clues. Several examples show how geologists interpret the clues.

Limestone mostly forms in warm, clear, relatively shallow (< 300 feet), marine waters – as in the Bahamas. Geologic evidence places Chambersburg in the subtropics during limestone deposition. This is consistent with requisite conditions for most limestone deposition. Fossils in these rocks, too, indicate warm and relatively shallow marine water.

Some fossils in the limestone are more specific in their clues, reflecting a tidal-flat environment -- that part of a coast tides affect. Still other fossils are even more informative, indicating the uppermost part of a tidal flat (supratidal).

Other local limestones are coquinas, consisting of fossil fragments. Broken fossils indicate abrasion and transport in a high-energy depositional setting, such as along shorelines or in tidal channels.

Local limestone may also show mud cracks (Figure 2). These are common at Laird Hall on the Wilson College campus. Mud cracks form from desiccation (drying) and indicate subaerial exposure (exposed to air). Today, we see them in dried up mud puddles. Certain depositional settings favor mud cracks, such as the uppermost part of a tidal flat (supratidal) – above high tide. Lower parts of tidal flats are either permanently below sea level (subtidal) or between high and low tides (intertidal). Neither setting is conducive to forming and/or preserving mudcracks.

Some local limestone has fine, horizontal laminations. Good examples can be seen in the entrance wall at Laird Hall of Wilson College and the Trinity Evangelical Lutheran Church. These are stromatolites (blue-green algae). Stromatolite shape or morphology reflects the depositional environment in which it formed. These particular stromatolites indicate an uppermost tidal flat (supratidal) setting. Stromatolites produced the oxygen in Earth's early atmosphere.

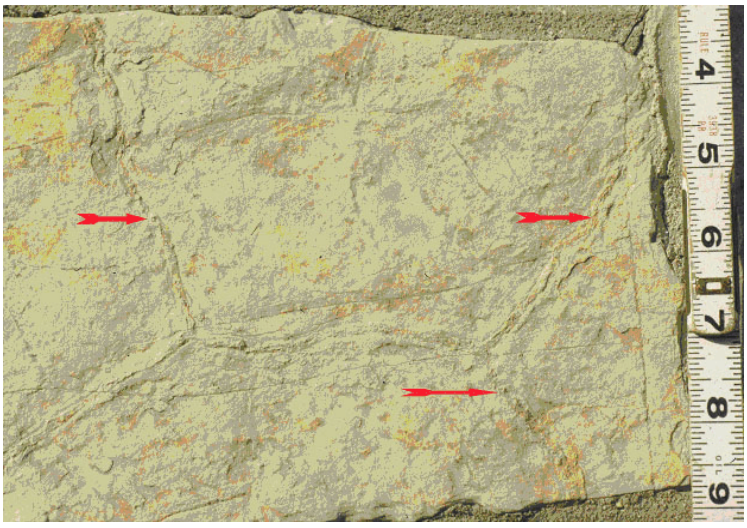

Figure 2: Mudcracks in limestone; Trinity Evangelical Lutheran Church.

Local limestone may contain intraformational or edgewise conglomerates (Figure 3). These are fragmented mud cracks and are, therefore, associated with tidal flats. Storm runoff or storm surges breakup mud cracks in the uppermost tidal flat (supratidal) and transport them to the lowermost tidal flat below low tide (subtidal). If the enclosing sediment becomes lithified (turned to stone), the intraformational conglomerates are preserved. Excellent examples are in the wall of the Old Shook Home for the Aged parking lot on E. Queen Street next to the Chambersburg Chamber of Commerce Building.

Figure 3: Edgewise or intraformational conglomerate in limestone; Old Shook Home.

Oolites are small spheres of calcium carbonate (chemical composition of limestone) that form in shallow, warm, and highly agitated water, such as a lower tidal flat. They resemble fish roe and consist of concentric layers, much like a hailstone or onion. A shell fragment or sand grain serves as a nucleus. As waves roll oolites back and forth, layers of calcium carbonate precipitate. Oolites are found in some local limestone.

Ripple marks are found in some local limestone. These form from moving water – either waves or currents. Their forms vary from symmetrical to asymmetrical. The former reflect oscillatory (back and One local "limestone" is dolomite. It is similar in appearance to limestone but has magnesium in its chemical composition that a true limestone does not. Most dolomite was originally limestone, altered to dolomite when lime sediment is flushed with magnesium-rich seawater. The most common depositional setting for dolomite formation is uppermost tidal flat (supratidal).

Bentonites

An important clue comes from bentonite layers in the youngest local limestone. Bentonite is volcanic ash, weathered to clay. The volcanoes have since eroded away. They were part of island arcs like the present-day Aleutian and Japanese Islands. These island arcs approached the east coast before present-day Atlantic Ocean existed. Bentonites were harbingers of pending collision between North America and Europe-Africa that produced mountains predating the Appalachians.

Prevailing winds distribute volcanic ash. When the referenced bentonites are mapped over a wide geographic area, their distribution makes no sense relative to current prevailing wind belts that circle Earth. However, if Chambersburg's location is adjusted to that during time of local lime deposition, bentonite distribution makes sense relative to wind belts.

Those interesting fossils

Diverse fossils are found in local limestone and are easily seen in most of the buildings surveyed.[9] Present in local building stones are: corals, brachiopods, ostracods, gastropods, cephalopods, crinoids, trilobites, stromatolites, cystoids, bryozoans, sponges, and worm tubes. These are easily identified using the Internet. Some fossils are particularly interesting and are described in more detail.

The most spectacular is the 3.5-inch gastropod (snail) *Maclurites magnus* (Figure 4) in the foundation of the Franklin County Courthouse, facing Lincoln Way East. This is the largest faunal (animal) fossil in the area, reaching six inches in dimension. Its large size makes it conspicuous. *Maclurites magnus* is an index fossil to the Ordovician Period (485-444 million years ago). This fossil is also seen in the stone post of the King Street Bridge, a private residence at 245 E. King Street, the former dental office of Dr. Donald Glen on North Second Street, the stone wall near the northwest corner of the former "repair/pickup" building of the former Sears and Roebuck Building at 218 North Second Street, and the rear wall, just right of the doorway, of the Trinity Episcopal Church at 58 South Second Street.

Figure 4: 3.5-inch gastropod (snail) fossil *Maclurites magnus*; Franklin County Courthouse.

The Old Franklin County Jail offers prolific and varied fossils in the walls of the former exercise yard. Of note is a 3.5-inch straight-shelled cephalopod (mollusk, Figure 5) in the wall facing North Second Street. The nautilus of today is a similar cephalopod except it has a coiled shell. Both have internal chambers. Those chambers and other internal features are seen in the fossil. During the Ordovician Period, cephalopods were the largest animals on Earth, up to 15 feet in length. A 1 3/8-inch example is in the south wall basement entrance at the parking lot of Corpus Christi School 's northern building on North Second Street. Other specimens are seen in Disert Hall of Wilson College, the Robert G. Sellers Funeral Home, and in the top stone block of the northeast post and in the northwest post of the King Street Bridge.

A local geologic history

Clues from the rocks tell us local limestone was deposited in shallow, warm, clear, marine water. Modern analogues are offshore Florida and the Bahamas. The climate was subtropical. Chambersburg was at approximately 25° south latitude.[10] The equator relative to North America was oriented almost due north-south, extending from Mexico into Canada. Length of a day and year were 21 hours and 420 days, respectively.[11]

Figure 5: Fossil cephalopod (mollusk) showing internal partitions (septa); Old Franklin County Jail wall.

Water depth may not have been greater than 33 feet.[12] In places, lime sediment was exposed to air for short periods of time, forming mud cracks. Surrounding land was of low relief. There were no high-relief mountains nearby from which eroded material could be transported into the lime-depositing sea.

Shoreline and near-shore environments included tidal flats and tidal channels transitioning into a nearly flat sea bottom covered with lime mud. Isolated algal (stromatolite) reefs (bioherms) were common. Other organisms included corals, sponges, gastropods, crinoids, brachiopods, trilobites, cephalopods, bryozoans, and ostracods. Just as in modern oceans, sea life was not evenly distributed. Some sea-bottom locations were suitable habitats and others were not. This is reflected in local building stones, some of which are fossiliferous while others are barren. Figure 6 depicts a typical, local, sea-bottom setting during this time. Lime sediment (white) covers the sea bottom. At center is a straight-shelled cephalopod using its tentacles to attack a trilobite. A second trilobite is at the image bottom. Two, smaller cephalopods are at upper right. On either side of the trilobite are two green sponges. Two small trilobites rest on top of one sponge (lower left). Surrounding the sponges are brachiopods (brown). Cone-shaped corals with orange tentacles are at top center. Several crinoids are shown on either side of the largest cephalopod. These animals mimic plants by having a stem on top of which are tentacles for filter feeding. Other organisms include algae (background) and two starfish (image bottom).

Limestone in the Chambersburg area was deposited continuously over 115 million years. Probably nowhere else in the world, certainly not in our country, has lime deposition occurred continuously over such a great span of time. This is also unusual because limestone is only deposited in relatively clear water. The implication is, for 115 million years, there were no significant mountain-building episodes (orogenies) in the local area. Such uplifts would have yielded eroded mud, sand, and gravel. Streams would have carried these materials to the shallow sea, making limestone deposition impossible or very limited.

The last of the lime deposition included volcanic ash (bentonites). Volcanic island arcs approaching eastern North America erupted the ash. The bentonites were harbingers of a pending closure to 115 million years of continuous lime deposition in the Chambersburg area.

Cessation of local lime deposition after 115 million years began with mud and sand deposition of the Martinsburg Shale found in the Chambersburg area. These materials were eroded from the Taconic Mountains that were slowly uplifted when Europe and Africa collided with North America. That mountain range has long since eroded away.

Figure 6: Reconstructed sea-bottom setting of the Chambersburg area during the Ordovician. (Univ. of Michigan Exhibit Museum of Natural History)

Endnotes

[1]This is a condensed version of a 55-page paper written for the Kittochtinny Historical Society and presented in October 1990. The original paper is in the Society's files.

[2]Root, S.I., 1968, Geology and Mineral Resources of Southeastern Franklin County, Pennsylvania: PA. Geol. Surv., Atlas 119cd, p. 5.

[3]Root, S.I., 1971, Geology and Mineral Resources of Northeastern Franklin County, Pennsylvania: PA. Geol. Surv., Atlas 119ab, , p. 4.

[4]D'Invilliers, E.V., 1886, Report on the iron ore mines and limestone quarries of the Cumberland-Lebanon Valley, Annual Report 1886, Part 4, 2nd PA. Geol. Surv., pp. 1411-1461.

[5]Stose, G.W., 1909, Mercersburg-Chambersburg Folio: U.S. Geol. Surv. Atlas of U.S., Folio 170.

[6]Stone, R.W., 1932, Building stones of Pennsylvania: PA. Geol. Surv., Bull. M15, pp. 161-164.

[7]Patton, J.B., 1953, Petrology of the Salem Limestone, Economic Geology, v. 48, p. 331.

[8]Patton, J.B., and Carr, D.D., 1982, The Salem Limestone in the Indiana Building- stone District, Indiana Dept. of Conserv. Geol. Surv. Occasional Paper 38, pp. 7, 9-10.

[9]Miller, Jr., C.E., 1983, Chambersburg offers a fossil field trip, Public Opinion, February 2, 1983, p. 15.

[10]Levin, H.L., 1988, The Earth Through Time, Saunders College Publications, New York, pp. 276-277.

[11]Dott, R.H. and Batten, R.L., 1988, Evolution of the Earth, McGraw Hill Publishing Co., New York, p. 348.

[12]Demicco, R. and Mitchell, R., 1982, Facies of the Great American Bank in the Central Appalachians, In: Central Pennsylvania Geology, NE SE GSA 1982 Field Trip Guidebooks, p. 256.

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.

March 1-2, 2014: Delaware Mineralogical Society Show, Delaware Technical & Community College, Stanton, Delaware. Sat. 10 - 6, Sun. 11 - 5.
http://www.delminsociety.net/marchshow.htm

March 22-23, 2014: Che-Hanna Rock & Mineral Club Show. Athens Township Volunteer Fire Hall, 211 Herrick Ave., Sayre, PA. Dealers, exhibits, kids activities, demonstrations, fossil ID, special exhibit and silent auction by Carnegie Museum, fossil exhibit by Paleontological Research Institute. Sat. 9-5, Sun. 10-4.
http://www.chehannarocks.com/show.html

March 29-30, 2014: EFMLS Convention and Philadelphia Mineral Treasures and Fossil Fair by Philadelphia Mineralogical Society and the Delaware Valley Paleontological Society. Lulu Temple, 5140 Butler Pike, Plymouth Meeting, PA 19462. Sat. 10-5, Sun. 10-4.
http://pms.moonfruit.com/#/mineral-show/4527879809

April 18-19, 2014: First Gem, Mineral & Fossil Show for the non-profit **North Museum of Natural History and Science.** At Farm & Home Center, 1383 Arcadia Rd (off Manheim Pike), Lancaster, PA. Friday 10-6, Saturday 10-5. **VENDORS WANTED:** $50.00 per table. Contact Alison Mallin, 717-358-7188 <amallin@northmuseum.org> for more information and to reserve a space

Geo-Sudoku Solution

L	E	A	S	I	T	O	N	**H**
S	I	N	O	H	L	T	E	**A**
H	O	T	N	E	A	S	L	**I**
A	T	I	E	S	H	N	O	**L**
O	N	L	A	T	I	E	H	**S**
E	S	H	L	O	N	A	I	**T**
I	A	E	H	N	S	L	T	**O**
T	L	O	I	A	E	H	S	**N**
N	H	S	T	L	O	I	A	**E**

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 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!

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Door Prizes: *volunteer needed!*
Refreshments: *volunteer needed!*
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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 name of photographer or artist.

Visit us at **www.nittanymineral.org**