



News

Volunteer opportunities, field trips, lectures, and public service, since 1938

From the President's Desk...

As I write this, the two GSM field trips to Michigan's Upper Peninsula ended a few days ago, and both were excellent trips. **Randy Strobel** and **Joanie Furlong** put together a three-day excursion to the Pictured Rocks area that included boat trips, shipwrecks, train rides, nature walks, sand dunes, and waterfalls. Immediately following, Keweenaw residents **Erika Vye**, **Bill Rose**, **Kari Anderson**, and *Agassiz* captain **Steve Roblee** treated us to an outstanding four-day insiders' view of the geology and geohistory of the Keweenaw Peninsula, from both the land and the water. We made great new friends, learned a lot, and saw parts of the Keweenaw that few do. But, you'll need to wait until the next Newsletter for details of our adventures, when **Vern Schaaf** will report on Pictured Rocks and **Roxy Knuttila & Frank Janezich** on the Keweenaw.

Other field trips: Elsewhere in this issue, first-time Newsletter contributor **Dave McGill** describes the second half of the Nevada field trip that many of us participated in this past March. This fall, **Randy Strobel** is arranging a Sunday afternoon field trip to Pilot Knob, which overlooks the confluence of the Minnesota and Mississippi Rivers. This is a site sacred to Native Americans and was used for navigation by riverboat captains. If you have not already, you will soon receive specifics by e-mail. Additionally, I am working to arrange further tours of St. Anthony Falls Lab this fall. We had great tours in December and April (see the February 2015 Newsletter), and I am hoping to make this opportunity available to more of you.

We are always looking for new field trip ideas. Is there some place of geological interest that you would like to visit, or have visited and would like to share with other members? Contact me and I'll put you in touch with someone who has experience organizing our field trips. Local field trips can be as short as a few hours, and often we can recruit a professional geologist as the technical leader.

The end of August means State Fair in Minnesota, and as GSM has done for decades, we are staffing our booth in the Education Building. Thanks to **Dan Japuntich** for stepping up to organize this major Society activity. Our booth is a significant means for recruiting new GSM members, as well as a way to educate fairgoers on GSM's activities and on Minnesota geology in general. Thanks in advance to each of you who are volunteering for one or more four-hour shifts. Everyone is encouraged to stop by our booth and say hi while you are at the fair, especially if you have not seen our booth in recent years.

Monday, September 14 marks the start of our lecture and lab series for the coming year. Once again **Steve Erickson** has recruited an outstanding group of speakers who will present on a variety of interesting and topical subjects related to the Earth Sciences. The full schedule appears elsewhere in this Newsletter, on our website (www.gsmn.org), and on



GSM President, Dave Wilhelm

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printed brochures we distribute at the State Fair and local libraries. All lectures and labs are open to the general public, so feel free to invite friends to lectures that you feel might interest them. As they did last year, our lectures will start at 7:00 on Monday evenings. Although this year’s schedule is fixed, if you have a topic or speaker that you feel might interest us, do not hesitate to suggest it to Steve for a future year.

Our initial lecture September 14 is also our Fall Banquet and Annual Meeting. The Fall Banquet will be held at the U Garden Restaurant, the same place that gave us great service for our last several banquets. Go to our website for specifics. Just prior to the lecture, we will conduct our Annual Meeting, during which we will nominate and elect new members to our Board of Directors.

We are looking for two new Board members prior to our Annual Meeting. Being a Board member does not take a great deal of your time (four meetings per year), and is a great way to give back to GSM and to have your ideas for our Society made known. Minutes for previous Board meetings are on our web site, as well as the dates for the next few upcoming meetings (usually the second Thursdays of February, May, August, and November). If you think you might be interested, contact me at dewilhelm53@msn.com and I’ll explain what is involved.

Our membership year starts in September, when everyone’s annual membership payment comes due. The easiest way to renew is to pay **Joanie Furlong** or **Mary Helen Inskeep** at the Fall Banquet or one of the lectures later this fall. Or mail in your membership form and dues to the address listed in this Newsletter and on our web site. The largest portion of your membership dues contribute toward our speakers’ honoraria, so all of us as members do a part in making the 2015-2016 lecture series possible.

As before, I encourage you to visit our web site (www.gsmn.org). It includes a wealth of information about our organization and about geology in general. Our web site includes

GSM News

Officers:

Dave Wilhelm, President
 Mary Helen Inskeep, Treasurer
 Rebecca Galkiewicz, Secretary

Board Members: Deb Preece; Ruth Jensen; John Jensen; John Grams; Mark Ryan; Roger Benepe; and Dan Japuntich

Editors: Theresa Tweet; Mark Ryan; Katy Paul; Harvey Thorleifson; Rich Lively

The Geological Society of Minnesota is a 501(c)3 nonprofit organization. The purpose of this newsletter is to inform members and friends of activities of interest to the Geological Society of Minnesota.

Send all GSM membership dues, change of address cards, and renewals to:

Joanie Furlong
 GSM Membership Chair
 P.O. Box 390555
 Edina, MN 55439-0555

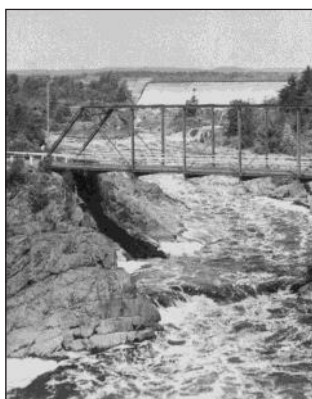
Membership dues are: \$10 Full-time students; \$20 Individuals; \$30 Families

GSM News is published four times a year: **February 15, May 15, August 15, and November 15.** Deadline for article submission is the first of the month, before the date of publication.

Newsletter contributions welcomed

Of interest to our GSM enthusiasts: While out and about enjoying your vacation time – when you visit a site that you find interesting, please consider sharing your experiences with us by writing up a few words and sending it to Theresa Tweet at phoenix8185@gmail.com. Thank you in advance!

from the GSM archives: St. Louis River at Thomson Dam, showing the anticline on the left, circa 1939.



a page of Geological Links. A recent addition there is the **Keweenaw Geoheritage** link, through which you can learn about many of the places we saw on our recent field trip.

Finally, thanks to our Newsletter editors, **Theresa Tweet** (phoenix8185@gmail.com), **Mark Ryan**, **Katy Paul**, **Harvey Thorleifson**, and **Rich Lively** for putting this issue together. They are always looking for articles. If you did or saw something this summer that you feel would interest other GSM members, submit a short article to inform us. We'd love to hear from you. The deadline for the next issue is November 1, with earlier submissions encouraged.

Hope to see you at the banquet and on campus for lectures.

GSM President, Dave Wilhelm

GSM Minnesota State Fair Booth 12 Days of FUN!

The Minnesota State Fair runs from August 27 – September 7th, 2015. The most important source of funding for the GSM comes from the new members generated from our State Fair Booth. There are still a few spots that need to be filled and if you will be attending the State Fair, please think about joining us in the State Fair Booth. You don't have to be a geologist – just a geology enthusiast – ready to share your love for the earth sciences with other State Fair Goers. For more information, contact Dan Japuntich by email: danjap7@yahoo.com or leave a voicemail at 651-216-6678.

Fall Banquet; Annual Meeting; and First Lecture of the 2015-2016 Series

The Geological Society of Minnesota's Fall Banquet, Annual Meeting, and first lecture of the 2015-2016 series are right around the corner. On September 14, 2015, please join us at the U Garden Restaurant, 2725 University Ave. SE, Minneapolis, for a talk on the **Paleontology of the National Parks of the Colorado Plateau**, presented by **Justin Tweet, M.Sc.**, of the National Park Service, Geologic Resources Division. Dinner will be from 5:00-7:00 PM, the Annual Meeting at 7:00, and the Lecture will follow at ~7:15.

GSM Internship

The internship for Alex Dolabi that the GSM was able to arrange through the generosity of Macalester College this spring was officially completed on May 1, 2015. However, Alex has agreed to fine-tune some of his work over the summer. For his project, Alex created lesson plans that could be used in GSM's 2nd-8th grade Hands-On Classroom Outreach program, as well as a glacier lab he edited for presentation to middle to high school students, plus the background information and instructions for using these files. Alex also created background information for three educational bins:

Water Cycle, Rocks and Minerals, and Fossils. I was quite pleased with Alex's work on these projects and I look forward to being able to work with him again on future endeavors.

Theresa Tweet

NOTES FROM THE PAST

A Letter written to the Mn Geological Society by member Helen Sommers describing her 1948 trip to France.

A NOTE FROM FRANCE:

As we came through a notch at the top of a long mountain climb, before us stretched the strangest tortured world of white limestone, eroded into canyons and caves and bare of all vegetation. Its heights were outlined against the horizon in fantastic startling shapes.

Along a band at a certain level well below the top were rectangular openings of various sizes cut into the exposures of the rock, sometimes in ravines, sometimes on cliffs. These were openings into quarries. For hundreds of years this rock has been quarried. It is the stone used at Geneva for the League of Nations.

No words can adequately picture those vast subterranean chambers and galleries. Our mushroom and Ford Plant caves are nothing. The rectangular character of every turn and wall makes a majestic architecture akin to the Egyptian temples. In one chamber someone has carved a modern Venus. I wondered what future archeologists, coming upon that figure and the names so freely scrawled upon the walls, would deduce as to our civilization.

The region is called Les Baux and is about 100 miles northwest of Marseilles.

Now as to what really prompted me to write. Descending the mountains, we came to the next layer, a band of reddish shale. When this shale was tried in pottery, it was found to contain aluminum. So here was a real type section, and the origin of the name of the ore of aluminum because of the neighboring town of Baux – **bauxite**.

Didn't my mind fly back to Pillsbury Hall and Dr. Gruner's laboratory where I first saw and touched bauxite! Little did I dream of ever seeing the type section itself. All I hoped was by some miracle to identify the mineral in a test.

Bashitanequeb

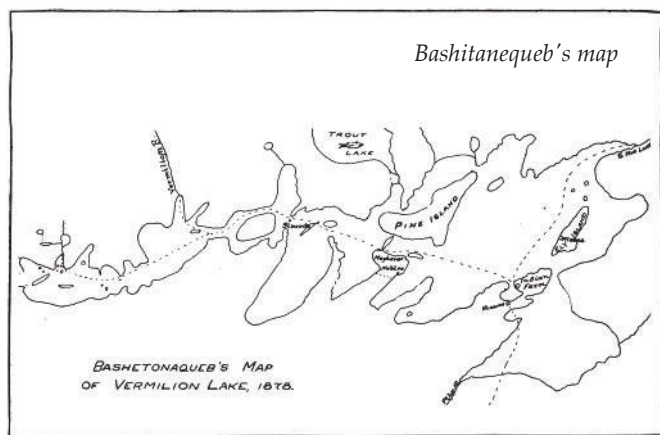
A little-known figure in the early study of our state's geology was an Ojibway man named Bashitanequeb, a member of the Bois Forte Reservation in northern Minnesota.

Commonly known as Charley Sucker (he lived on the Sucker Point section of the reservation on Lake Vermilion), Bashitanequeb served as canoe man, guide and cook for several of the state's geology and natural history survey teams, beginning with Newton Horace

Winchell's first investigation into the region. A valuable navigation aid used by Winchell was a map hand-drawn by Bashitanequeb on foolscap paper.

Bashitanequeb, which means "Steps

Bashitanequeb



Over", had been involved previously with George Stuntz when the latter was constructing and improving the Vermilion Trail from Duluth to Lake Vermilion in the late 1860s. The route was instrumental in the development of Minnesota's iron industry.

In 1901, Bashitanequeb and two other Bois Forte residents travelled by train to Washington D.C. to voice their tribal concerns to the government. While in the capital, the three men were photographed for the Smithsonian Institute in two poses: one in their traditional native garb and the other in modern "citizen's" clothing typically worn by whites. These photographs can be found in author Bruce White's book "We Are at Home: Pictures of the Ojibway People".

Winchell also included a photograph of Bashitanequeb (reprinted here) in his 1899 *Report on the Geological and Natural History of Minnesota* (vol. I, plate QQ).

Bashitanequeb later delivered mail for the United States Postal Service over the Lake Vermilion route. Two lakes were said to have been named in his honor: Charley Lake and Bashitanequeb Lake, both in Cook County. However, neither seems to exist by those names today.

Geological Society of Minnesota Trip to Las Vegas – Part II

In the summer newsletter, Maria DeLaundreau reviewed the first part of our spring trip to the Las

Vegas area, including stops at Red Rock Canyon, the Keystone Fault, Valley of Fire State Park, the Lost City Museum, Hoover Dam, Lake Mead, the Black Canyon, Frenchman Mountain and the Great Unconformity.

Here I continue with the remaining stops on the trip: Pahrnaghat National Wildlife Refuge, Kershaw Ryan State Park, Cathedral Gorge, the Clayton Valley Cinder Cone, the Sump, the Goldfield Lithium Mine, Tonopah Mining museum, and Death Valley National Park.



Pahrnaghat (McGill)

Located directly north of Las Vegas along Highway 93, the Pahrnaghat Valley is a major desert oasis along the Pacific Flyway. An explosion of life in an otherwise inhospitable environment, the Valley provides refuge for over 250 species of birds. Within the park are found meadow, marsh, stream, lake, riparian, and desert habitats. In the interpretive center, we learned of the disheartening history of the area: in the mid-19th century, prospectors and settlers massacred and forcibly relocated the native population of Nuwuvi.

Dan steered us to his secret hiding place and we covered the landscape looking for Apache tears — marble sized obsidian stone, rounded and smoothed as they were spat from a volcano.

Continuing another 50 or so miles north and west, our next stop was Kershaw Ryan State Park at Caliente. The park is essentially a beautiful valley featuring steep canyon walls and a narrow valley. The park featured a fantastic exposure clearly showing the line where the sandstone rock below was baked by the overlying lava.

In this photo, we can see evidence of water running through the rock along the incline, confined by impermeable rock around it. As it descends, the water builds hydrostatic pressure, and then finds a crack in the rock where it is forced



Kershaw Ryan baked sandstone (McGill)

up as a spring. This accounts for the vegetation at the base of the exposure.



Upside down garden (McGill)

Twenty miles farther north on Highway 93 brought us to Cathedral Gorge State Park. This spectacular formation features a wall of slot



Cathedral Gorge (McGill)

canyons carved from 2.5 million year old silt/clay deposits of an ancient lakebed.



Cathedral Gorge siltstone source (McGill)

The original source of the siltstone in the foreground can be seen across the lakebed.

Next we encountered a 390,000 year old basaltic magma feature (the cinder cone volcano, not Roxy and Frank!) along the roadside.



Frank and Roxy at the cinder cone (McGill)

About 40 miles west of Tonopah, 6 and 10 miles south on 773, is the fantastic, other-worldly setting called The Sump. This less visited area is a vast wash framed on both sides by high valley walls. Petrified trees, long since fallen and crumbled, can be found throughout the area. I had been struggling to understand the basic mechanism responsible for basin and range topography until we (Randy!) discovered this textbook perfect natural model for the process. The tip of the rock has broken off and is currently sliding down to the left and tilting up—characteristic of basin and range topography. The basin created between the two ranges is even filling with sediment!



Basin and Range at the Sump (McGill)

This area also features the distinctive spiral



Spiral Hoodoo (McGill)

hoodoo, no doubt the most photographed rock in the park!

A quick stop at the lithium mine in Goldfield reminded us that the earth is still giving up its mineral resources, although the particular mineral here is no longer gold or silver, but lithium used for batteries.

Much of the rich mining history of Nevada is on display in the storied little town of Tonopah. The California Gold Rush of 1849 was long gone when



Mizpah Mine at Tonopah (McGill)

gold was discovered here essentially by accident (so we learned at the Tonopah Mining Museum and Park) in 1900 by the colorful and still locally revered couple of Jim and Belle Butler. Eventually, the mine was to produce \$1.2 billion at today's prices.

Finally, we hopped in our vehicles for our last leg of our fantastic journey — west and south through the Rhyolite Ghost Town and up and over the Black Mountains and a descent into Death Valley.



Artist's Palette (McGill)

On the west side of the Valley, perhaps 10 miles south of Furnace Creek, we stopped to hike into Artist's Palette, named for the rock faces that have been chemically weathered to produce varied color clays. Note the cross section of the old lake bed sediments close to the bottom:



Fault scarp in Death Valley (McGill)

On our journey south through this incredible landscape, we (I, anyway!) discovered that much of the long length of the valley features massive and perfectly formed alluvial fans. At one of these fans, we were able to clearly see another feature of basin and range topography — this time the real

thing at full scale! In the picture below, the fault line and scarp is clearly visible and the mountain is tipping up and to the left, leaving the alluvial fan behind. Amazing!

And finally, here is an iconic image of Devils Golf Course showing the mottled gypsum, soda ash, and borax deposits on the surface of the ancient lake



Devils Golf Course in Death Valley (McGill)

bed. Tough to chip on, but at least your ball won't roll far!

David McGill

Visiting the United States Geological Survey National Center

Many people have visited the Washington D.C. area to see the Smithsonian exhibits, the Lincoln Memorial, or to take in one of the city's well known festivals or events. I would like to add to this list of sites the United States Geological Survey National Center (<http://www.usgs.gov/>) located in Reston, Virginia.



USGS Reston, Library

The USGS Center is home to the Clarence King Memorial Library and boasts over 3.2 million items (in print and in digital form) and is the largest earth science library in the world. Additional branch libraries are located throughout the United States. Enter through the doors under the fascia marked "Visitors". At the Reston headquarters, you will need to sign in, present a picture I.D. (such as a driver's license) and pass through security screening before being allowed to enter the facility.

For tours, there are two options; the Customized Group Tour and the Self-Guided tour, both which begin on the first floor. The first floor houses dozens of floor to ceiling shelving units, with each of these units containing hundreds of various sized books devoted entirely to the earth sciences.

Down the stairs, in a lower level of the building, a shelving unit holds a wide of assortment of globes,

USGS Reston, Map Room



including a tectonic plate map globe with moveable plates, and several metal floor cabinets that house

thousands of topographic maps of diverse locations in various sizes.

Elsewhere, you will see an assortment of interesting displays such as "Library Treasure's", "Earthquakes in the East", and "Geomagnetism" as well as a *Tyrannosaurus rex* footprint. As part of its community outreach, the Center often exhibits mixed-media artworks done by local and national artists on the walls of its Art Hallway.

The United States Geological Survey National Center is open daily from 9:00 a.m. – 4:00 p.m. and proved to be a wonderful side trip. For a few brief moments, I avoided the crowds, the traffic, and the long lines that accompany the other sites in the vicinity, and instead enjoyed some books, art, and solitude.



USGS Reston, woods

For more information: <http://www.usgs.gov/visitors/>

MEMBERSHIP RENEWAL REMINDER

Our fall membership renewal is on the horizon. Renew by mail or wait until the lecture series starts September 14, and renew in person. Everybody will be up for renewal this fall when the new lecture series starts. (Some people have just recently paid so your renewal date is September 1, 2015). If you wish to mail in your dues please include the information below.

Membership renewal September 1, 2015 to September 1, 2016

Name(s) _____

Address _____

Phone _____ E-mail(s) _____

Would you like to help save money (and trees) and receive our quarterly newsletter only by email

Yes _____ No _____

Please make check payable to : **GSM**

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Membership Levels

Geological Society of Minnesota

() Student -----\$10

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() Individual----\$20

Edina, MN 55439-0555

() Family -----\$30

() Sustaining----\$50

() Supporting---\$100

_____ Membership fee

_____ Tax-deductible contribution (GSM is a 501(c) 3 nonprofit educational organization)

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