



THE GEOLOGICAL SOCIETY OF MINNESOTA

News

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

**1938
GSM
2013**

Celebrating

**

75 Years

**

From the President's Desk...

After what seemed like a winter that would never end, I took an early spring hike in the Afton State Park. The cutbacks were steep, but the rapidly moving ice floes in the St. Croix River were beautiful – almost haunting. With the last of the winter fading into a gorgeous backdrop of white and gray, the spring season has finally taken this winter's place.



With the advent of spring comes the advent of travel. I've been to dozens of National Parks, primarily in the Southwest, but the parks of the Northwest have seemed to elude me. Perhaps it's because of the time and distance factors and that the weather is not always conducive for travel. This year, 2013 is my year for doing something different – I'm actually catching up with old friends which I have been promising to do for years and checking out a few new parks along the way.

First on my agenda will be Theodore Roosevelt National Park. I've seen it a number of times, but never really looked at it. I'm interested in its geology, anxious to check out the results of its heavy downpours, wildfires, and the wind's erosion over thousands of years.

National Park link: <http://www.nps.gov/index.htm>

Closer to home, on the third weekend in July is the Agate Days Celebration at Moose Lake. I've been there a number of times and I am looking forward to this year's celebration as well. There will be music, a weekend gem and mineral show, and their annual Agate Day Stamped. The Agate Day Stamped is when the Moose Lake Chamber of Commerce mixes "400 pounds of agates and \$300 in quarters" together with rocks and they are

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poured right down the main street by dump truck. The stampede takes place as people dig through this mixture to get their share of the treasure!

State Parks: http://www.dnr.state.mn.us/state_parks/index.html

Not able to take a full day off with friends or family? Meet up with them at one of Minnesota’s many County Parks. A Wikipedia Site with a link to county regional parks: http://en.wikipedia.org/wiki/List_of_county_and_regional_parks_in_Minnesota

My bike has had its yearly “physical”, its trunk is packed up for a day’s run, and the car rack is ready to go – yep, you guessed it – today I’m checking out a county park! My best to you and your families and cheers to all! Enjoy the wonderful spring and summer of 2013!

~Theresa Tweet, President

GSM News

Officers:

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Editors: Katy Paul and Harvey Thorleifson

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:

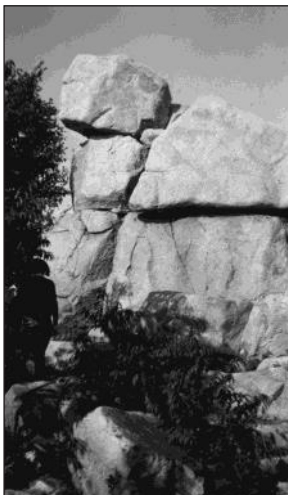
Joanie Furlong
GSM Membership Chair
P.O. Box 390555
Edina, MN 55439-0555

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.

Send all material to:
Katy Paul
keystone517@hotmail.com

from the archives: A visit to the top of Rib Mtn, Wausau, Wisconsin on a GSM Field Trip Aug. 1940.



REMINDER!



...Just around the corner...

In the next couple of months, the **State Fair Committee** will start putting together a list of workers for our Fair Booth in the Education Building. We will need 72 people, each to work a 4-hour shift at the fair.

The fair starts on **Thursday, August 22 and ends on Labor Day, September 2**. Each day is divided into three shifts; 9am to 1pm; 1pm to 5pm; and 5pm to 9pm. Two people are required for each shift. (Rules of the Minnesota State Fair Administration.)

Staffing the State Fair booth is a lot of fun and you don't have to be a geology expert. Most young and old alike will show interest in our rock display and the multiple areas they are from. Discussing our Field Trips and the many professionals that speak at our lectures seems to spark interest in the young students and often in the parents of young students. The time goes by quickly and everyone seems to enjoy the visits. We will have our rock specimens this year and some new items to bring more attention to our booth. Our job at the Fair is to show our enthusiasm and invite others to come and join us. We'll have our brochures and fall lecture schedules to hand out as we invite those with an interest in geology and rocks to join us at our lectures and field trips. There are also books and other materials to show them. Please relate your enthusiasm to our visitors, as the State Fair has been our main source of new members.

Even though it's early in the year, this is a good time to get the shift you want. Call Sandy Steffner at 952-831-5165 or contact by email at ssteffner@comcast.net to claim your spot. If I don't hear from you, you'll be hearing from me before long.

~Sandy Steffner

Last Lab of the Season:



What do you get when you take a Boy Scout troop, mix in a group of geology enthusiasts and enter a well stocked, well staffed geology lab? A good time of course!

On March 2nd, Macalester College and Professor Jeff Thole hosted a Mineral / Rock Cycle Lab. We had an excellent turnout of 57 people. Participants were given six sheets, one sheet

each on the classification of metamorphic rocks, sedimentary rocks, and igneous rocks along with their corresponding ID sheets to fill in, as well as numerous mineral and rock specimens to use in the identification process.



A special thanks to Jeff Thole, Steve Erickson and all of the students who staff the Macalester College Geology Lab – we had great time learning!

~Theresa Tweet

In honor of the 75th Anniversary
GSM THROUGH THE YEARS....
Compiled from past issues of the
GSM Newsletter

70 years ago –1943

Dr. Per K. Frolich of Standard Oil Company states that the world has sufficient oil reserves to last at least 300 years at the current rate of consumption. To convert crude oil into gasoline (at \$2.00 per barrel) costs 8 ½ cents per gallon of gasoline, and to obtain the same amount of gasoline from coal, synthetically, costs 20 cents per gallon... Discovery of very fine quartz crystals has been made on Diamond Point Mountain near Hot Springs, Montana. Crystals have been pronounced entirely satisfactory for use in radar and other fine equipment. Good crystals are worth \$10.00 a pound, and production is estimated at 5 tons per day.

60 Years ago – 1953

In Memoriam: Mr. W. C. Wilson who was affectionately known as “Bill” to his many friends was the essence of geniality, a loyal friend and a real student, one who actually studied a subject intensely...All who knew Bill Wilson will regret that their little world will not be quite the same with his passing...The 13th Annual Midwest Federation Convention will be hosted next summer by the St. Louis Mineral and Gem Society.

50 Years ago – 1963

No Newsletters were published in 1963

40 Years ago – 1973

The long awaited text, “The Geology of Minnesota”, published by the Minnesota Geological Survey, is now available. Intended as a centennial volume in honor of George M. Schwartz, this book will be a comprehensive review of the geology of Minnesota with 33 authors contributing papers. It is available in both paperback and hard cover versions.

30 Years ago – 1983

The Public Service Committee has reported that our display at the Elm Creek Rest Center on I-94 is still in good shape. The Center is planning to install “light boxes” for advertising. There is a possibility of mounting transparencies within these boxes. A new I-94 Information Center is considered for Hudson, Wisconsin, plans for which will be let in February 1984. As this would require more funds than we have available, the committee may have to seek foundation grants. Much work needs to be done to prepare for this more ambitious project.

20 Years ago – 1993

The North Metro Mini Tour, “Fire and Ice”, is finally printed. This first in a series of three driving tours being prepared by the Geological Society in consultation with the Minnesota Geological Survey, lead you to discover the origins of rocks and landscapes observable in the Twin Cities area. Each tour covers a different area. Much time and effort went into the planning and preparation of these tours. The Society thanks all the members who worked so hard for so long to bring this project to completion.

10 Years ago – 2003

The Minnesota Geological Survey is facing a budget cut of at least 8% for the coming two years as state lawmakers enter the final stage of wrestling with the state budget. The MGS is funded through the University of Minnesota’s budget bill. The budget request submitted to the Legislature by Gov. Tim Pawlenty included deep cuts in funding for all higher education institutions.



Thomson Falls, GSM Fieldtrip, 1939

2013 SPRING BANQUET-SILENT AUCTION

THANK YOU!

“The Geological Society of Minnesota is a public-spirited, nonprofit educational organization that has been in operation since 1938. Our ongoing mission has been to promote public interest and supply educational support in the geological sciences. We do this by sponsoring free lectures and labs at the University of Minnesota, conducting statewide and regional field trips, holding classroom presentations for schools, maintaining a media library, publishing relevant information for public distribution, and maintaining and expanding upon a series of geological markers located throughout the state.”



This is our mission statement and it takes a lot of caring individuals to make things happen, and for 75 years! Not many other organizations can make that claim. The best part of my job was being able to recognize those people who have given their all to make and keep this organization running as effectively and efficiently as possible. The volunteers being recognized did this by



taking part in some sort of activity to promote the GSM in the community over the past four years. The Spring Banquet and Silent Auction, held this year on May 4th at Affinity Plus in Roseville, is more than a fundraiser: it is a chance to get together with other GSMers and recognize those volunteers.

Those that will be receiving beautiful engraved mugs by Tom Cody (if they haven't already) are Bill Robbins, Steve Erickson, Doug Zbikowski, Joanie Furlong, Katy Paul, Randy Stroebel, Alan Smith, Ed and Sandy Steffner, Fran Corcoran, and Allan Bowles.

For those that have served as our president, we have been giving engraved rock hammers. This year was special in that Estwing is celebrating their 90th year, and so donated their limited edition rock hammers to the GSM – already engraved with the GSM Logo! Those who are to receive rock hammers are Dick Bottenberg and Roger Benepe.

A third hammer was donated and I had the GSM Logo added above the Estwing Logo to give to our long-time partner, the Minnesota Geological Survey. Accepting this hammer will be Harvey Thorleifson, the Director of the Minnesota Geological Survey. I don't think that we could wish for a better partner.



Banquet continued—

I would also like to thank: Brian Schmidt at Affinity Plus for allowing us the use of the new facility in Roseville; Justin Tweet who gave us the talk on the “Paleobiology of Hadrosaurs (Duck-billed Dinosaurs)”; Harvey Thorleifson at the Geological Survey of Minnesota for the donation of books; Doug Zbikowski for his donation of books, rocks, mineral samples, and former markers from Elk River and Gooseberry Falls; Lisa Peters for her children’s books; Mark Ryan for his two composite Colorado Unconformities pictures; Dick Bottenberg for the stone globe and pricing help; ZRS; Mountain Press; Estwing; Mills Fleet Farm; Caribou Coffee; Sam’s Club; Lesson Pros; Annie Elmer Personal Trainer; and Jo Anne Lorenz – Good for You Massage. Also, thanks to Daniel Japuntich, Allan Bowles, and Kevin Welk for helping with the sale and auction tables, Sandy Steffner for taking care of the food items, and Sherry Keesey for covering the sales portion of the Auction. Additionally, thank you to all of those in attendance who were able to put the room back in order in record time - we were out by 8:00!

~Theresa Tweet, President

calibrated with precisions approaching less than 0.05%. Some notable time intervals for which collaborative, multifaceted efforts have led to dramatic improvements in understanding include the Triassic-Jurassic, Permian-Triassic, and Neoproterozoic-Phanerozoic boundaries (or transitions).

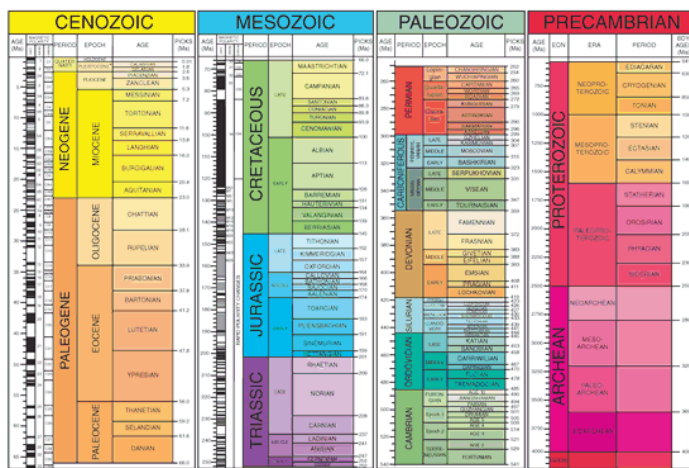
The first Geologic Time Scale was produced in 1913 by 23 year old Arthur Holmes (1890-1965). At the turn of the twentieth century, there was no numerical geological time scale and the “age of the Earth” controversy was at its peak. The physicist Lord Kelvin had calculated the age to be around 20 million years; the majority of geologists demanded at least 100 million years, while religious dogma required only 6000 years.

In 1905, English physicist Ernest Rutherford had suggested that the energy emitted by radioactive minerals in the form of particles and rays could be used to date the minerals. Called radioactive dating, this technique measures the rate of decay of certain unstable atoms, such as uranium, contained within minerals. Using this new technique, Holmes was able to determine the age of minerals and thus the rocks they are in, and in 1913, he estimated the age of the Earth to be 1.6 billion years, far older than was believed at the time. Holmes revised this estimate throughout his life, as measuring techniques improved.

Holmes’ initial estimates of Earth’s eras have held up remarkably well over time: For example, he placed the beginning of the Cambrian period at around 600 million years ago; today 590 million years is the time frame largely accepted. Over the past 100 years, the confluence of process-based geological thought with observed and approximated geologic rates has let to coherent and quantitatively robust estimates of geologic time scales, reducing many uncertainties to the 0.1% level.

The new GSA Geologic Time Scale (18 X 27”) can be purchased for \$9.95 from the [GSA Store](http://www.geosociety.org) online at www.geosociety.org.

NEW GEOLOGIC TIME SCALE



The Geological Society of America (GSA) has published a new Geologic Time Scale which has undergone substantial modifications, commensurate with major advances in understanding of chronostratigraphy, geochronology, astrochronology, chemostratigraphy, and the geomagnetic polarity time scale. Many parts of the time scale can be

A Summer Vacation Idea

If your summer vacation plans involve heading west, I highly recommend you drive through north eastern Nebraska on your way, and make a stop at the Ashfall Fossil Beds, a state historical park. It is located 6 miles north of U.S. 20 between Royal and Orchard, in northern Antelope County.



The park offers a fascinating chance to step back in time and see what Nebraska wildlife was like long before modern man ventured onto the Great Plains.

Visitors can watch the ongoing excavation of a unique 'time capsule'. A 2,000

square foot "Rhino Barn" protects part of the fossil deposit, where skeletons are uncovered and displayed exactly where they are found. Walkways give visitors a close-up view as paleontologists carefully brush away the volcanic ash from the massive skulls of native American rhinos and the delicate side hooves of tiny ancestral horses.

Some 10 million years ago, hundreds of rhinos, three-toed horses, camels and other animals died and were buried by volcanic ash around the edges of a watering hole in what is now northeast Nebraska. Still locked in their death poses, the amazingly well-preserved skeletons of these prehistoric beasts lay undisturbed, wrapped in a blanket of jagged glassy particles, until the 1970s, when scientific study of the fossilized remains began.

It is extremely rare for whole herds of animals to die and be buried so quickly that their carcasses remain largely intact, as has happened at Ashfall. In the ash bed some rhinos were literally buried in their tracks, with their last footprints clearly visible. Some females have calves next to them, while others have unborn young inside. Many contain the fossilized remains of their last mouthful of grass.

10 million years ago, Nebraska was covered with subtropical grasses and patches of jungle. Discoveries at Ashfall give a detailed picture of what you'd see on such an imaginary safari. Only a fraction of the site has been excavated, so, much remains to be learned. However, it is clear that before the catastrophic ashfall occurred, the area was inhabited by a rich variety of

life reminiscent of modern East African savannas. More than 40 species of animals and plants have been identified from fossils collected just below the ash bed.

Scientists believe that an incredible volcanic eruption in the Rocky Mountains, probably in what is now southwest Idaho, produced a huge ash cloud that killed and eventually buried the animals as the cloud blew east. Part of the great cloud of abrasive dust settled out to a foot or so deep over much of northern Nebraska, then it began to blow around like fresh snow. Eventually the high ground was blown free of ash, but low-lying areas like the marshy pond at the Ashfall site were filled to depths of eight feet or more.

Paleontologists are trying to discover exactly what happened at the Ashfall site by studying the arrangement of the bodies of the victims. At the very bottom of the ash bed are small creatures such as pond turtles, birds, musk deer, and small carnivores, which probably died almost immediately. Just above these remains in the ash are skeletons of horses and camels that died next. Many of these early victims were chewed on by scavengers or were crushed and trampled by larger animals that survived longer. Finally above the horse and camel skeletons are the rhinos. Along with occasional giant tortoises, they were the last to die.



The Visitor Center at Ashfall has interpretive displays and the glassed-in working fossil preparation laboratory. You can ask the paleontologists about their work and watch as they uncover the fossils. There is also an excellent gift shop containing many good books about fossils and geology. Picnic areas and walking trails are also provided. This is a great place to visit, both fun and educational.

~Katy Paul

Map and photo from Smithsonian.com



Another Award for Betty McCollum!

The Association of American State Geologists (AASG) Pick and Gavel Award, recognizes distinguished friends of geology who have made or are making major contributions to advancing the role that geoscience plays in our society.

This year Congresswoman Betty McCollum of St. Paul was recognized for her work in protecting drinking water.

The award consisted of a large Lake Superior agate; with two additional Minnesota gemstones - thomsonite, a light-colored zeolite also from the north shore of Lake Superior, and deep red, chatoyant binghamite from the Cuyuna iron range in Crow Wing County.

Samples were selected with the generous assistance of Peter Giangrande, Enchanted Rock Garden, Mpls.



P.O. Box 390555
Edina MN 55439-0555

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