



## WELCOME NEW MEMBERS

Ryan Bishop  
Barry Brinkman  
Don Brown  
Jennifer Engstrom  
Mary Ann Litfin  
Joelyn Malone  
Rick & Cathy Meyer  
Darrell & Faith Mytty & Family  
Valerie Raverty  
Richard John Rippley  
Kate Schroeder

# GEOLOGICAL SOCIETY OF MINNESOTA

# NEWS

SPRING 2009  
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## Congratulations To All Involved In The Historical Marker Project

To observe and celebrate Minnesota's 150<sup>th</sup> year since its state charter, the Minnesota Sesquicentennial Commission was formed. The Commission dissolved Jan 31, 2009, but before its departure, it produced a little present for the GSM and, ultimately, for the public education of geology in Minnesota.

About two years ago, GSM President, Janet Hopper, held a meeting in her home to discuss the fate of the GSM markers project that was stalled by the denial of federal funding. After meeting with the GSM and learning of our stalled project, one invited guest, Rep. Diane Loeffler, identified the possibility of the Sesquicentennial funding for this project. Working through Theresa Tweet as a project facilitator, Doug Zbikowski, Chair of GSM Public Service, contacted and partnered with the Minnesota DNR and wrote a grant proposal, which after some negotiation and modification was finally approved by the Commission.

The proposal resulted in a grant for \$40,000 from the Commission, but required an equal value in matching funds and/or in-kind labor or materials.

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### Board Vacancy

Once again we have a vacant spot on the GSM Board. **Dorothy Kuether** has volunteered to fill that spot but awaits a vote by the existing Board. If you are interested in this vacant position, please advise a member of the nominating committee. They are Bently Preece, Kathy Ahlers, Doug Zbikowski, and Bill Robbins.

## Tentative Field Trips Summer 2009

Mark your calendars!! Here is a list of tentative field trips planned by the trip committee recently.

**May 16, 2009, Saturday**, 9:00 a.m. to 1:00 p.m.  
Brickyards in Lilydale Regional Park, which is part of the St. Paul Parks Dept. Leaders will be Roger Benepe and Steve Erickson. We will collect trilobites, crinoids, maybe even a piece of a cephalopod.

**July 18 and July 19, 2009**, Two day trip. Saturday and Sunday. Minnesota River Watersheds, South Central Minnesota. Will travel by bus, with significant hiking, canoeing and choice of camping or motel. This would be a combination of glacial geology and river history. Leader Carrie Jennings.

**August, 2009** (No day or time as yet). The Red Wing Area. Leader Randy Strobel. This will depend upon what we will be seeing with Carrie Jennings in July.

**September, 2009** Ice Age Trail in Wisconsin, probably by bus. 1 or 2 days with leader Kent Syverson of the University of Wisconsin EauClaire.

None of the above trips are “carved in stone” but mark your calendars and watch for mailings.

*Submitted by Janet Hopper  
Field Trip Committee Chairperson*

### GSM NEWS

**Editor:** Judy Hamilton  
**Production Mgr:** Katy Paul

The Geological Society of Minnesota is a 501(c)3 nonprofit organization. The purpose of this newsletter is to inform members and friends of the activities of the Geological Society of Minnesota. GSM NEWS is published four times a year: **February 15, May 15, August 15, and November 15.** GSM NEWS welcomes unsolicited Geology and Earth Science related articles and photographs. Deadline for article submission is the first of the month, before the date of publication. Send all material for GSM NEWS to the address below.

#### OFFICERS:

Ly Preece, *President*  
Dick Bottenberg, *Vice President*  
Paul Jansen, *Treasurer*  
Sandy Steffner, *Secretary*

Directors in addition to the officers listed above: Megan Jones; Edward Steffner; Alan Smith; Harvey Thorliefson; one vacancy

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

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

Membership levels are \$10 Full-Time Students;  
\$20 Individuals; \$30 Families

What do Irish geologists collect?  
Shamrocks

What is a rockhound's favorite band?  
The Rolling Stones

The objective of the project would be to construct 5-10 interpretive geological markers in various State Parks and the Split Rock Lighthouse historical site. The matching in-kind contributions are as follows: The Minnesota DNR will provide \$18,750 in reviews, coordination, and supervision of operations. The GSM will provide \$5,000 in cash and \$16,500 in project management, procurement, and facilitation. Thus, the total value of the project will be \$80,250.

We are grateful and congratulate all who have participated in this effort. Now, the remaining physical work begins: to procure and install 5-10 markers by June 30, 2009, with final reporting of this completion to the Minnesota Historical Society by July 31, 2009. The GSM Historical Marker Committee volunteer members are Doug Zbikowski, Theresa Tweet, Gerry Paul, Paul Jansen, and chair Ed Steffner.

This event is a remarkable opportunity to contribute to a prime objective of our Society, which is to further promote the geological history of the state. The markers will be viewed by the public with 360 words of description displayed on a cast bronze plaque mounted on a support of natural stone. This can be an ongoing project as we locate and acquire additional funding from various sources and urge anyone who wishes to financially contribute to this effort to please contact the chair or any member of the committee for ear-marking of that contribution.

Thanks to the Board and all who have supported this effort as we now proceed to construct these geological markers. A word of thanks to the MN DNR for the planning and other work by park managers, now being coordinated by Bryce Anderson, Interpretive Operations Coordinator-Parks Division. We are grateful to our Project Director, Doug Zbikowski, for his perseverance and the maintenance of necessary engineering and design documents that can now be used for this project.

*Submitted by the GSM Historical Marker Committee*

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### **2008 Death by Earthquake**

Approximately 88,070 earthquake-related fatalities across the world in 2008 were reported by the USGS and confirmed by the United Nations Office for Coordination of Humanitarian Affairs. This number was much higher than in recent years. This past year's strongest and most destructive earthquake occurred in eastern Sichuan, China, on May 12, claiming at least 69,185 lives. In the contiguous United States, 2008's highest magnitude earthquake was a 6.0 on February 21 near Wells, Nev., causing no fatalities but injuring at least three people and severely damaging more than 20 buildings.

## The Minnesota Geological Community

The GSM Town Hall meeting in April 2008 made us all realize that we indeed have a geological community in Minnesota – a network of people who have a common interest in geology, through our professions and our passions. We recognize, of course, that everyone is interested in geology to some degree, whether through jewelry, minerals, rocks, fossils, dinosaurs, volcanoes, earthquakes, evolution, or landscapes. But only a few thousand of us cross the line to say that geology defines us in whole or in part. GSM has been promoting the interests of this community since 1938, with an annual program of lectures, labs, displays, and field trips. The Minnesota Geological Survey (MGS), now 30 or so people, was established in 1872, and first Director Newton Horace Winchell is a great figure in Minnesota history, while the US Geological Survey was established in 1879, and the Minnesota office houses over 50 people performing essential services for the people of Minnesota, largely in hydrology.

The 2008 American Geological Institute Directory of Geoscience Departments lists fourteen postsecondary geoscience departments in our state, and according to the directory, faculty in these programs number 1 at Anoka-Ramsey College, 4 at Bemidji State, 6 at Carleton College, 2 at Concordia College, 2 at Gustavus Adolphus, 1 at Itasca College, 5 at Macalester, 13 at Mankato, 8 at Saint Cloud State, 12 at UMD, 4 at Morris, 23 at the U, 2 at Saint Thomas, and 5 at Winona. Students enrolled in geoscience majors presumably number somewhat in proportion to these numbers of faculty. Geology is also taught at Normandale, Moorhead, North Hennepin College, Southwest State, and no doubt there are other programs. We also have major research programs in the state, such as those of the National Center for Earth-surface Dynamics, the Limnological Research Center, the Water Resources Center, and the Institute for Rock Magnetism at the U, as well as centers such as the Large Lakes Observatory, Natural Resources Research Institute, and the Precambrian Research Center at UMD. Geologists also are employed by State Agencies who need the skills of geologists to fulfill their regulatory roles, such as the Department of Natural Resources (DNR) Division of Lands and Minerals, the DNR Division of Waters, the Department of Health, Minnesota Department of Transportation, the Pollution Control Agency, Minnesota Board of Water and Soil Resources, and others. Geologists also play a big role in the mining industry that is active throughout the state, and they play many roles in ensuring the reliability of our drinking water and similar roles. Geologists organize themselves at many levels, including national and international associations.

We also link to the broader earth science community, including meteorology, hydrology, soil science, and engineering. Scientific societies promote the progress of a discipline, and examples of Minnesota associations that hold conferences, lectures, and other activities include Minnesota Ground Water Association (MGWA), and the Mesabi Range Geological Society. Professional associations protect the public by ensuring adherence to appropriate professional standards – in this, roles are played by Minnesota Board of Architecture, Engineering, Land Surveying, Landscape Architecture, Geoscience and Interior Design (AELSLAGID), as well as the Minnesota Section of the American Institute of Professional Geologists (AIPG). Teachers who are active in the Minnesota Earth Science Teachers Association (MESTA) educate young Minnesotans, while programs such as the Center for Global Environmental Education and the Minnesota Science Teachers Education Project (MnSTEP) at Hamline University support their role. Rock and mineral clubs are a big part of Minnesota life, and active clubs include Anoka, Austin, Carlton, Cuyuna, Minnesota Mineral Club, Minnesota Valley, New Ulm, St. Croix, Steele, and Little Crow. People learn about Minnesota geology from MGS and USGS reports, and other publications, or from books such as ‘Minnesota’s geology’ by Ojakangas and Matsch. They also

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## GOLD

Of all the minerals mined from the Earth, none is more useful than gold. Its usefulness is derived from a diversity of special properties. Gold conducts electricity, does not tarnish, is very easy to work, can be drawn into wire, can be hammered into thin sheets, alloys with many other metals, can be melted and cast into highly detailed shapes, has a wonderful color and a brilliant luster.

When Spanish explorers first arrived in the "New World" they met the native South Americans. These two cultures had been separated by a vast ocean, they had never touched one another, they spoke different languages and lived entirely different lives. Yet they had one thing in common - they both held gold in highest esteem and used it to make some of their most important objects.

Throughout the history of our planet almost every established culture has used gold to symbolize power, beauty, purity and accomplishment. Today we continue to use gold for our most significant objects: wedding rings, Olympic medals, Oscars, Grammys, money, and ecclesiastical art. No other substance of the same rarity holds a more visible and prominent place in our society.

The production of ornamental objects was probably the first use of gold over 6000 years ago. Gold is found in the pure state, is very easy to work and was probably the first metal used by humans. About 78% of the gold consumed each year is used in the manufacture of jewelry. Pure gold is too soft to stand up to the stresses applied to many jewelry items. Craftsmen learned that alloying gold with other metals such as copper, silver, and platinum would increase its durability. Since then most gold used to make jewelry is an alloy of gold with one or more other metals.

Because gold is highly valued and in very limited supply it has long been used as a medium of exchange or money. The first gold coins were minted under the order of King Croesus of Lydia (a region of present-day Turkey) in about 560 BC. Gold coins were commonly used in transactions up through the early 1900's when paper currency became a more common form of exchange.

The most important industrial use of gold is in the manufacture of electronics. Solid state electronic devices use very low voltages and currents which are easily interrupted by corrosion or tarnish at the contact points. Gold is the highly efficient conductor that can carry these tiny currents and remain free of corrosion. Electronic components made with gold are highly reliable. Gold is used in connectors, switch and relay contacts, soldered joints, connecting wires and connection strips.

Gold is used as a drug to treat a small number of medical conditions. Injections of weak solutions of sodium aurothiomalate or aurothioglucose are sometimes used to treat rheumatoid arthritis. Particles of a radioactive gold isotope are implanted in tissues to serve as a radiation source in the treatment of certain cancers.

Gold is used in hundreds of ways in every space vehicle that NASA launches. Gold is used in circuitry because it is a dependable conductor and connector. In addition, many parts of every space vehicle are fitted with gold-coated polyester film. This film reflects infrared radiation and helps stabilize the temperature of the spacecraft. Without this coating, dark colored parts of the spacecraft would absorb significant amounts of heat. The visor on the helmet of an astronaut's space suit is coated with a very thin film of gold. This thin film reflects much of the very intense solar radiation of space, protecting the astronaut's eyes and skin. Gold is also used as a lubricant between mechanical parts of spacecraft. In the vacuum of space, organic lubricants would volatilize and they would be broken down by the intense radiation beyond Earth's atmosphere. Gold has a very low shear strength and thin films of gold between critical moving parts serves as a lubricant - the gold molecules slip past one another under the forces of friction and that provides a lubricant action.

*Submitted by Katy Paul*

learn from television, formal education, observation, museums such as the Bell Museum, the Science Museum, and the Agate Museum, and also from roadside markers, caves, the Soudan mine, and other parks. Geology gives us a lot, and if you wish to give back, recipients such as the MGWA Foundation or the Bell Museum can give you a tax receipt! What did I miss? Please email me to let me know at [thorleif@umn.edu](mailto:thorleif@umn.edu).

*Contributed by: Harvey Thorleifson Ph.D., P.Geo., D.Sc., Director, Minnesota Geological Survey, State Geologist of Minnesota; Professor, Department of Geology and Geophysics; University of Minnesota; 2642 University Ave W, St Paul, MN 55114-1057 USA; Telephone 612-627-4780 ext 224; Fax 612-627-4778; [thorleif@umn.edu](mailto:thorleif@umn.edu)*

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### **In Memoriam**

Gerald Mundt, "Jerry", passed away January 6 from Cancer. He was 75. Many of you will remember him, among other things, from our Kentucky field trip, where he and his son, Bruce, displayed their fluorite find, after dark, using florescent lights, on the backyard patio at the Marion Inn.

Jerry was an interesting man to listen to. He was an architect for 44 years, his firm specializing in camp planning, senior housing and nursing homes throughout the country. He was a man of action who delighted in doing it himself. He and his wife of 53 years, Diane, built a cabin in Wisconsin with lumber from the property. They also built ponds and trails, planted trees and considered it their wildlife refuge. He ran for the Minnesota legislature in 1972 because of his concern for the environment.

After retiring, Jerry studied paleontology at the School of Mines in Rapid City, So. Dakota. While there, he discovered a complete skeleton of a plesiosaur. He led paleontology trips for the U of M's Osher Lifelong Learning Institute and he was a member of GSM for some time.

*Information Taken from the Obituary Section of Star Tribune.com*

Jerry Mundt  
on the Kentucky field trip



## QUARTZ

Quartz is all around us. It is the major component of beach sand and many rocks. Under the right conditions, quartz can form large, nearly perfect crystals—sometimes with vivid colors that transform an everyday mineral into an exquisite jewel.

Quartz sand is the most important raw material for the glass and ceramics industries. It is also an additive in cement and mortar and a source of silicon for computer chips. Crystals of synthetic quartz, made largely from sand, are used in lenses and watches. To keep time, watches rely on quartz's piezoelectricity: Quartz crystals vibrate in response to an electric current at a specific frequency, depending on the thickness of the crystal.



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