Promoting public interest and educational support in the geological sciences



## From the President's Desk...

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



Hi GSM Members! As we move through the 2021 Fall Season and head toward the Holidays, we continue to hope for a lessening of Covid restrictions. The Fall Banquet had to be cancelled and it looks like virtual lectures will be the norm into early 2022 as well. I miss the direct interaction with the membership, as I imagine do you. However, thanks to a great schedule of programs this Fall (thanks again Steve Erickson) and to good technical support from Randy Strobel, we have had strong attendance at the first three lectures of the new season (101, 73, and 70 respectively). More good lectures with strong attendances to follow, I trust.

As mentioned in my letter in the August 2021 GSM News, we opted out of State Fair participation due to Covid concerns. Our State Fair Chair, Patrick Pfundstein, did get us valuable participation in the MN Mineral Club Show in September (see article later in this issue). Thank you Patrick!

Due to the cancellation of the September Banquet/Annual Meeting, we had to hold our Board Election by email again this year. Patrick Pfundstein and John Westgaard were re-elected to serve second two-year terms starting January 1, 2022 and Roger Benepe and Deborah Naffziger were elected to new two-year Board Terms starting on Jan 1 as well. Congratulations to them all. Other GSM Board Members for next year include: Pete Hesse, Nancy Jannik, Wolf Bielefeld, Frank Janezich, and Roxy (Knuttila) Janezich. Dave Kelso and I will be leaving the Board at the end of this year after serving four-year terms; Dave served as secretary and treasurer. Thank you Dave!

At our November 2021 Board Meeting (scheduled for November 11), the Board will elect officers for the coming year. These include President, Vice-President, Secretary, and Treasurer. All Board Members for the coming year are eligible to hold any of these offices. Best of luck to our new officers for 2022.

The Holiday Party? At this point, Ed and Sandy Steffner say, "it's not a good time to hold a party."

It is with some misgivings that I note that my term as GSM President will end in two months. I have truly enjoyed serving you all in that capacity. It has been a challenge and an honor, and I have had the support of a host of very capable people. My one regret is not being able to interact with the membership in live meetings. Hopefully, we will be able to have that experience again soon. Here's wishing you all a very pleasant holiday season and a wonderful new year.

Warmest Regards,



GSM President, Joe Newberg

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## <u>Visit us on</u> Facebook!



from the GSM archives: Morton Granite–Gneiss Quarry, June, 1946



## GSM 2021 Board of Directors: Joe Newberg, President Patrick Pfundstein, Vice President Dave Kelso, Treasurer Dave Kelso, Secretary Board Members: Wolf Bielefeld; Pete Hesse; Frank Janezich; Nancy Jannik; Roxy Knuttila Janezich; John Westgaard Field Trip Coordinator: David Wilhelm; Liaison Officer: Dave Wilhelm; Geological Markers: Rebecca Galkiewicz **GSM Outreach:** Joel Renner Lecture Recording: Joe Wright Membership: Joanie Furlong Newsletter: Kate Clover; Mark Ryan; Harvey Thorleifson; Rich Lively Programs/Lectures/Labs: Steve Erickson State Fair: Patrick Pfundstein Video Library: David Wilhelm Webmaster: Alan Smith Web Site: gsmn.org

The Geological Society of Minnesota is a 501(c)3 nonprofit organization.

**GSM Mail Address:** Send all GSM membership dues, change of address cards, and renewals to: Joanie Furlong, GSM Membership Chair, P.O. Box 141065, Minneapolis, MN 55414-6065

#### Membership categories and dues:

Student (full time)	\$10
Individual	\$20
Family	\$30
Sustaining	\$50
Supporting	\$100
Guarantor	\$250

Individual and Family memberships can be renewed for 1, 2, or 3 years. Members donating at the Sustaining, Supporting or Guarantor levels will have their names highlighted in the GSM membership directory.

**GSM News:** The purpose of this newsletter is to inform members and friends of activities of interest to the Geological Society of Minnesota. GSM News is published four times a year during the months of February, May, August and November.

#### Newsletter contributions welcome:

GSM enthusiasts: Have you seen interesting geology while traveling? If so, please consider sharing your experiences with others through our GSM Newsletter. Write a short article, add a photo or two and send it in. Deadline for submission is the first of the month before the publication date. Send your story to newsletter editor: Kate Clover, <u>kclover@fastmail.fm</u> Thank you in advance.

#### **GSM Board Membership:**

The GSM Board consists of members who have a special interest in advancing the goals of the society, including lectures, field trips, and community outreach. The Board currently has ten members, and our bylaws limit terms to four years to encourage turnover, and a change of perspectives and ideas.

The Board meets quarterly, on the second Thursdays of February, May, August, and November, or on a different date if conflicts arise. In-person meetings are from 7-9 PM at the Minnesota Geological Survey at 2609 W. Territorial Rd, St. Paul, MN 55114.

Board meetings are open to all GSM members. If you are a new or long-time member and Board membership is of interest to you, please consider attending a meeting. If you have a topic you would like the Board to consider, please contact Joe Newberg, <u>joenewberg@gmail.com</u>

## Welcome New Members!

Robert Callery, Woodbury Terry Mackin, Bloomington Fred Haynes, Rochester, NY Andrew Lee, St. Paul

## Notes from the Past – December 1949 DEDICATION OF GEOLOGICAL MARKER

by Lawrence W. King

When Mr. Burch undertook the activities which preceded the formation of this Society he did so in a missionary spirit, with a burning desire to convey to others the understanding and appreciation of scenery which he enjoyed. His object was the education of laymen, the presentation of geology as a cultural study. The field trips which he led and the lectures he delivered were for the purpose of developing leaders by whom his program would be continued. To that objective this Society is committed. In meeting here today to dedicate this tablet in his memory it is with the realization that our obligation to him cannot be discharged

until we have conveyed to others the contribution he made to us. This tablet, dedicated to him by our presence, is the first payment on that debt which will not be paid in full until other markers have explained this geological paradise, which is Minnesota. The inscription on this, the first of the Geological Highway markers reads as follows:

## GEOLOGY OF MINNESOTA TAYLORS FALLS REGION

About 750 million years ago the Lake Superior region was the scene of tremendous volcanic activity. Of the 500 or more lava flows which issued from great fissures, some reached as far as Taylors Falls. The rocks of the St. Croix gorge at this point are composed of that lava. Many millions of years later, when the Eastern outlet of the Great Lakes was blocked by glacial ice, the St. Croix was one of the outlets of Lake Superior, at which time this gorge was eroded. The abrading action was caused by sand and gravel carried by the great volume of water moving at high velocity. The pot holes in the State Park one-half mile North of this site were formed by similar action,

Erected by the Geological Society of Minnesota In memory of its founder, Edward P. Burch In cooperation with the Department of Highways, State of Minnesota.

#### Tom Schoenecker, 1932-2021

It's with a heavy heart

members that long-time

away on Friday, October

"He loved Geology and collected hundreds and

organized our State Fair

make calls to members and ask them to take a

shift or two. This was

communication easier.

Our records show that

Tom & Edna have been

members since 1997.

before e-mail made

that we inform GSM

member Tom Schoenecker passed

1, 2021. He was 89.

hundreds of rocks."

Tom, for many years

activities. He would

Edna, his wife noted,



Tom and Edna Schoenecker at the San Andreas Fault on the 2012 GSM field trip. Photo by Dave Wilhelm

Dave Wilhelm notes: I remember how much fun Tom & Edna were on field trips.

Ed Steffner notes: we will miss everybody's Santa. Such a calling Tom had. He spread so much happiness to so many. And he loved our GSM.

Diane Lentsch notes: So many memories of fun-filled field trip moments with Tom & Edna. He was a unique guy and quite a character.

For more about Tom, see his Member Profile in the February 2021 GSM News.



Steve Erickson working on an Oklahoma oil production map while working for geologist J. Glen Cole, associated with I.C. Gas Amcana, in Tulsa Oklahoma circa 1985

I have always been interested in all sciences, and thought I would go that way when I went to college in the fall of 1974 at St. Olaf. Calculus 1 was God's way of telling me I would not be a physics major. After two years, I decided to leave school and join the military. The Edmund Fitzgerald sank on Lake Superior at that time and the U.S Coast Guard was in the news. So, I joined the Coasties, became a Radio Operator and learned Morse Code (and most important, learned to type 50 wpm to copy code). I missed the chance to go to Antarctica aboard an icebreaker by one month - I finished radio school the month after the breakers had all gone south. (Five guys in the previous class all got berths on two breakers).

I went on the USCGC Venturous, a 210 foot Medium Endurance cutter for 2 years. Interesting experience, glad I did it, glad I stopped doing it. I got a chance to board a Russian fishing trawler. I did pick up one SOS, my big chance to be a hero. We were off San Diego when I picked it up, very faintly. I called ComSta San Francisco, asked if they heard it. They said "forget it, the call was in the Atlantic". The radio waves had skipped over the entire continent.

I was stationed in Long Beach California at the time. My brother Rick had become a geologist and told me that geology was a hot employment field in 1980. The energy crisis of the 1970's made oil exploration very big. So, when I got out of the service, I entered Cal State Long Beach and got a geology degree. From there, I did my grad studies at the University of Tulsa. I did a Master's thesis in McCurtain County Oklahoma (the Southeastern most county), one of the few areas of that state not explored. The oil boom went bust, and I was laid off from two oil companies in Tulsa. I moved back to Minnesota, hoping to get into environmental work. While attending some lectures at the U of M geology

department, I saw a flyer for the GSM. I started attending lectures about 1995. When people found out I had a geology degree, I was invited to join the Board, somewhere around 1998. I became the GSM President in 2002. In 2006, Public Art St. Paul did a sculpture exhibit called Minnesota Rocks! I got a chance to help with that. Artists from around the world came and created sculptures from Minnesota rocks, which went on display across St. Paul. One interesting side note, when a statue of Dr. Martin Luther King was to be created in Washington DC for the National Park Service, the people involved in that looked at some of the work done for Minnesota Rocks, and that aided the selection of the artist for that monument.

Rick Uthe was an Earth Science instructor for the General College at the time. He had been setting up the programs for GSM for many years. When he retired, he asked if I would be interested in taking over his job as program chair. I started that around 2005, and have been at it ever since. Lots of fun doing that, but also a challenge during the winter months. A couple of years ago, we had to cancel several lectures. I am one of the people who makes that call, and it can be nerve wracking trying to decide if we can get together. This past year has been a challenge but a great opportunity as well. I have reached out to geologist all across the US. All seem to understand what we do and all are interested in helping out.

I have led two field trips through downtown St. Paul, to show the building stones, and tell a little of the geology of those rocks. I took this from Sister Joan Kain, who had written a field guide to St. Paul. I have also led a field trip to the Brickyards for fossil hunting. I had been busy the past 10 years helping care for my mother, so field trips were a little scarce for me. Mom passed away in January of 2020, so I now have more free time to travel.

## 2021 Public Shows Report



With a return to some form of post-pandemic normalcy in the Spring of 2021, the Minnesota State Fair (MSF) and the Minnesota Mineral Club (MMC) confirmed plans to revive their public programs, and GSM's board approved the Society's return to the Fair and to MMC's Rock, Gem and Mineral Show. Unfortunately, as you know, the Covid delta variant broke loose in late July, and facing staffing shortages and concerns of members and the public, GSM and several other educational exhibitors withdrew from active participation in the 2021 Fair. The Fair was still held but with fewer vendors and exhibitors, and attendance was 61% of that in 2019. Despite withdrawal, GSM remains in good stead with the Fair. As State Fair Chair, I've already reached out to MSF for participation in the 2022 event.

MMC's annual show adapted to the post-Covid conditions by moving the show forward a month to take advantage of more outdoor spaces, and the show shifted indoor exhibitors to the State Fair Dairy Building, a large building with high-ceilings and good ventilation. There was also good outdoor space nearby for vendors and food trucks (including Tom Thumb donuts which at least one GSM volunteer was thrilled about). The show was held without a hitch; and after two years, GSM was back in front of the public.

Our table had the usual numbered rock and fossil specimens, our Marker and Lecture brochures, a short selection of books, some state geology maps, and a draft of the Minnehaha Marker. But most of all, it had some great GSM volunteers behind that table, actively representing our organization to an interested public!

Conditions were great, and attendance was strong with 1553 attendees on Saturday, and another 1241 on Sunday for a show total of 2994. GSM had a prime location near the entrance, and we gave out nearly twice as many lecture and marker brochures as were distributed in 2019 (174 lecture brochures vs 100 in 2019, and 94 Marker maps against 50 in 2019). I'd like to thank Program Chair Steve Erickson, and Members Alfred Knauth and David Schaaf for stepping up to staff the table, and an extra hat-tip to David for sharing his knowledge of online volunteer recruitment, which should pay big dividends for next year's State Fair. Thanks as well to Ashley Bedard and the volunteers at MMC for putting on such a great show. Looking forward to 2022!

Patrick Pfundstein

#### MINNESOTA UNDERGROUND: A Guide to Caves & Karst, Mines & Tunnels, by

Doris Green and Greg Brick PhD

Book Review by Gary K. Soule The Second Edition of MINNESOTA UNDERGROUND has been highly anticipated by cavers and the public who are familiar with the fine first edition. This new and improved edition is

# MINNESOTA UNDERGROUND



remarkable in its complexity in covering just about everything in Minnesota that relates to anything underground and available to the public. This also includes surface features like museum exhibits, cave related mining features and buildings as well. In fact, 40 more additional listings are provided in this new, updated volume. As for the

99 illustrations or photos in the book, you will find 86 color photos, three black and white photos, two historically reproduced cave maps, six reproduced old cave postcards, and even two artistic cave sketches.

The state is divided into five main regions which are: Southeastern Minnesota, Southwestern Minnesota, Minneapolis-St. Paul Area and St. Cloud, St. Croix River Valley, and finally, Northern Minnesota. Taken all together, an impressive 81 sites in 23 different counties are covered. A total of 13 museums are also included, that represent cave and mining replicas, not to mention geology. For each site listing, accurate directions, the season/hours the site is open, length and precautions if appropriate, amenities, and other information are all provided. I can only imagine how much research and traveling co-authors Doris Green and Greg Brick poured into the production of this book. For biologists, even White Nose Syndrome as it relates to bats is covered to quite some extent, not to mention one of the 21 special sidebars covering the native tan camel crickets of Reno Cave. Better yet, read about the Banshee Cave Subterranean Laboratory as it relates to cave life!

It is only appropriate that a picture of the lengthy Mystery Cave near Spring Valley, Minnesota, is featured on the front cover. Cavers will really enjoy also reading about Niagara Cave with its 60-foot high underground waterfall near Harmony, and even the extensive details on caver John Ackerman's Minnesota Cave Preserve. Did you know that his properties exist in both Iowa and Minnesota, and encompass 42 caves, 714.3 surface acres, and 1,274 acres of underground rights? The book is very current, even including his recent purchase of the Hiawatha Caverns near Witoka, Minnesota. This cave used to be open to the public, and undoubtedly more caves will be found.

I learned a new fact as well, regarding scenic Niagara Cave. Here I quote: "In 2015 Niagara Cave became the first commercial cave in the world to use solar energy to fully meet all its energy requirements. A 210-foot photo-voltaic solar panel array produces 45,000 Kilowatts per year."

I was pleased to see some of the show caves in neighboring states featured as well. These include Wisconsin's longest cave, Crystal Cave near Spring Valley, Wisconsin; Spook Cave near McGregor, Iowa; and Crystal Lake Cave near Dubuque, Iowa. In many regards, this book answers so many questions. Where was a prehistoric man crushed by a giant boulder? What about Red Wing's underground river? Where is an almost 1,000-foot long "Tunnel of Love?" Can a lava tube be found in Minnesota? Going further, caves or sites are featured that were used by prehistoric animals, storage shelters for everything from books to dynamite, as well as restaurants, and even for boating and kayakers. Speaking of books, can you imagine two man-made caves dug out and finally opened in 2000 to store books? One cave alone holds over 1.5 million books in shelves 17.5 feet high! Yes, it is 85 feet underground and yes, the public can tour it. Mines and the mining landscape of Minnesota are nicely featured, but in reviewing this informative book, I cannot help but comment on one such mining site. This is the Soudan Underground Mine State Park in St. Louis County. It has to be the deepest public underground tour attraction in the entire U.S. for sure. I know it was the deepest penetration I have ever made in my lifetime into the earth's crust. You ask how deep? Well, a rickety, dimly lighted mining cage takes you down 27 levels to a depth of 2,341 feet. You can actually see the mine levels fly by you as you descend! You are half a mile underground and even below sea level! You can then board a train and off you go. On the other hand, Greg talks about his rather basic Banshee Cave subterranean Laboratory that he set up in the Ice Box, a rather unusual cave on the banks of the Root River in Southeastern Minnesota.

Online reviews of this fascinating book are certainly appreciated. While I admit I lean more towards the natural caves, this book certainly has a tremendous and very broad public appeal due to its extensive coverage of literally all aspects of underground Minnesota. If you like natural caves and the unusual, including man-made features, then this is your ideal guide! The authors seem to have literally not missed anything! A word about the co-authors is worth noting here. Both Doris Green and Greg Brick are cavers and are well known in the caving community. Greg Brick has a PhD. and was employed as a hydrogeologist. He has also taught geology at local colleges and universities. He is the 2005 Peter M. Hauer Spelean History Award recipient, and currently edits "The Journal of Spelean History." He is the foremost authority on what natural caves, as well as manmade tunnels, exist in the Twin Cities area. He has written many cave books, including "Subterranean Twin Cities," and "Minnesota Caves: History & Lore."

Doris Green was a communications specialist with the School of Human Ecology at the University of Wisconsin – Madison. She holds a Bachelor's Degree from the School of Education, and a Master's Degree from the University of Wisconsin – Madison. Her Master's Degree is from the School of Journalism and Mass Communication. She has also written many previous books, including two different editions of "Wisconsin Underground."

Interested in purchasing the book? Here's information: MINNESOTA UNDERGROUND A Guide to Caves & Karst, Mines & Tunnels Second Edition, By Doris Green & Greg Brick, PhD Copyright: 2019; HenschelHaus Publishing, Inc., 6540 W. Forest Home Avenue, Suite 102, Milwaukee, Wisconsin 53220; six by nine inches format, 191 pages softbound. ISBN: 978159598-746-4. Available from the publisher for \$19.95, plus \$6.75 for flat rate shipping. <u>https://</u> henschelhausbooks.com/product/minnesotaunderground-a-guide-to-caves-karst-mines-tunnels-2nd-edition/

Amazon also sells this book - shipping cost varies.

# Rockin' and Rolling at Jasper Beach, Maine



Jasper Beach, Machiasport, Maine

On a recent trip to Lubec, Maine (that's close to the easternmost point of land in the continental US), we detoured off Highway 1 to see Jasper Beach south of Machiasport. The *Roadside Geology of Maine* book described

Jasper Beach as a "small and steep beach with nicely rounded and polished pebbles of volcanic rock, striped in shades of brown, red and black." I needed to add one more beach to my Atlantic coast list. It had rained off and on that morning, and the fog was dense especially along the coast. We arrived at the beach, parked and watched the rain falling pretty

much horizontally. Oddly, sitting in the car in the parking lot, an eight-foot high berm of fist-sized cobbles blocked any view of the ocean. But we could hear the crash of the waves, the sound of rolling rocks, and the howling wind. The ocean wasn't far away. Undeterred, we donned our rain gear and found a path around the steep berm determined to



Map, courtesy of the USGS

figure out what the noise of the waves and rocks was all about. There we saw a beach of all rocks; we watched and listened to the waves rush onto the shore and climb the slope. Then the water receded and

immediately seeped and drained into the rocks making a mesmerizing hissing sound.

The steep wall of stones rose from the



Cobble berm at Jasper Beach

water-formed terraces between the parking lot and the shoreline. We visited at low tide and on a stormy day, and we imagined—with higher gale-force winds

*As the waves recede and the water drains, it creates a hissing sound* 

and high tide, the waves would reach to the top of the berm. The Roadside Geology book explained: "The beach face is steep mainly because most of the water that waves cast onto it soaks into the gravel, leaving little to run back down the beach to move the pebbles."

The beach is named Jasper Beach, but the red rocks are rhyolite, not jasper. Other rocks are mostly volcanic along with granite and quartzite. The area was heavily glaciated so that explains the variety of rocks found on the beach. Other rock erodes from the nearby rocky bluffs. All were well-rounded and polished as a result of the pounding waves and constant abrasion; imagine one-giant rock polisher. There was no sand-sized sediment where we walked, but a friend did find coarse sand at the far ends of the beach a few years back, where there is far lower wave velocity. Also interesting at this beach are the cusps that form at One of the most low tide along the shoreline where the waves run famous



Cobbles with a wet boot for scale. The vibrant colors of the stones show when they are wet.

parallel to the beach. The *Roadside Geology of Maine* notes, "the spacing of the cusps is related in part to the distance between the crests of the approaching waves."

What a beautiful and interesting beach. Sadly, the driving rain caused

us to cut short our visit—but we will return again to hike the beach and to look more at the diversity of rocks.



Cusps exposed at low tide

#### References:

Caldwell, Dabney. *Roadside Geology of Maine*, 1998. Maine Geologic Facts and Localities, June 2000. Jasper Beach, Machiasport, Maine

https://digitalmaine.com/cgi/viewcontent.cgi? referer=https://www.google.com/ &httpsredir=1&article=1330&context=mgs\_publications Photos and Story by Kate Clover

#### Friedrich Mohs and the Mineral Scale of Hardness

We all have heard of Mohs hardness scale for minerals, but how many know where the scale originated and who it is named for? This article, written and illustrated by Hazel Gibson, is republished with permission from the European Geoscience Union (EGU) online GeoLog blogsite: https://blogs.egu.eu/geolog/2020/09/25/freidrich-mohsand-the-mineral-scale-of-hardness/

identification methods in the study of mineralogy is the Mohs Scale of Hardness. A comparative scale, based on the hardness of each mineral, it is a way geoscientists can compare minerals to each other and organize them based upon an easily testable



physical characteristic. Each level of hardness has a value, from 1 (the softest) to 10 (the hardest) and each number is associated with a mineral example. The hardest, with a Mohs scale of 10 is diamond! But why do we organize minerals in this way, and who was Friedrich Mohs – the person who invented the whole system?

Born in Germany in 1773 <u>Friedrich Mohs</u> trained as a geologist with a specialty in mining. In 1801 he moved to Austria to work as a mining foreman and was also hired by a wealthy Austrian banker, <u>J.F. van der Null</u>, to curate and identify his vast collection of minerals. He later continued this work at the <u>Joanneum</u> <u>Museum</u>, in Graz, Austria. At the time minerals were mostly classified by their chemical composition, but this wasn't very consistent, and Friedrich wondered if there wasn't a better way.

He decided to follow the example of botanists and group minerals together according to their physical characteristics – starting with how hard they were. He was not the first to do so; Pliny the Elder had first compared the hardness of the minerals diamond and quartz to each other in his book <u>Naturalis</u> <u>Historia</u> written in 77AD, and Friedrich decided to continue Pliny the Elder's ordinal ranking system. Eventually he came up with a set of 10 values of hardness that could all be determined relative to each other using the now-famous scratch test.

Although Mohs' method of classifying minerals based on their physical properties was not widely accepted at the time, he had a long and successful career in mineralogy, mining and geoscience. He died at age 66, 181 years ago this week, but not without fundamentally changing the way we study minerals to this very day.

Hazel Gibson

# GSM Membership Application/Renewal 2021-2022

Name	Phone (H)
Address	Phone (C)
City	State Zip
Email Address(es)	
Where did you learn about GSM? What stim	ulated you to join?
Membership: Please make check payable to:	GSM
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P.O. Box 141065	
Minneapolis, MN 55414-6055	
Membership Levels:	
( ) Individual \$10 ( ) Individual \$20; \$40 (2 years); \$60 ( ( ) Family \$30; \$60 (2 years); \$90 ( ( ) Sustaining \$50 ( ) Supporting \$100 ( ) Guarantor \$250	3 years) 3 years)
Membership fee (from above)	
Media-library membershipadd \$15	one-time fee
Tax-deductible contribution (GSM is	s a 501(c)3 nonprofit educational organization)
Check here if you want a contribution	on receipt for tax-filing purposes.
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