



THE GEOLOGICAL SOCIETY OF MINNESOTA

News

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

From the President's Desk...

Happy New Year! As I write this, it is late January and we have survived our coldest temperatures in almost 7 years (and hopefully the coldest of this winter – we'll see).

I want to welcome **Wolfgang Bielefeld**, **Javier Guzman**, and **Mary Helen Inskeep** to our Board; they were elected at our Annual Meeting in September, replacing **Roger Benepe**, **Dave Kelso**, and **Deborah Naffziger**. Wolfgang & Mary Helen have served on our Board previously, while Javier is dipping his toe into Board membership for the first time. I want to thank Roger, Dave, and Deborah for completing two terms (four years) serving on our Board. At the same Annual Meeting, **Lowell Hill** and I were re-elected to second terms on the Board. At our November Board meeting, we elected Society officers for 2026. Besides me as President, **Stephen Willging** was re-elected as Secretary, **Mary Helen** was elected Vice President, and **Dan Japuntich** Treasurer. All terms began January 1. Our full Board membership appears on Page 2, along with many other important roles that do not require Board membership. I look forward to working with all these persons, and all of you, to advance the mission of GSM, which has now been in existence for 88 years, since 1938.

As I write this, our seminar series resumes shortly. The schedule appears on our website and elsewhere in this issue. I want to thank our Program Director, **Steve Erickson**, for putting together a well-rounded program of in-person and remote speakers. Note that at least two lectures (Feb. 23 & Mar. 9) are online via Zoom. And a highlight of each winter is our Saturday morning lab at Macalester College, conducted by **Jeff Thole** on Feb. 14. This year's topic is "Rocks and the Minerals that Define Them – an Exploration of Minerals that Make Up Common Rocks." Consider bringing school-age children to this, as it is very hands-on and there are many museum-quality exhibits in Olin Hall.

Concerning our lectures from last fall: we presented seven lectures with 476 total attendance, an average of 68. A very impressive 45 persons identified as new attendees. This compares to an average attendance of 55 for fall 2024 (a healthy 24% increase), with 19 new attendees.

We had a bonus lecture on January 15, co-hosted by GSM and the **Lake Minnetonka Historical Society** at Wayzata City Hall. This was arranged by **Dick Bottenberg**, a member of both societies. **Carrie Jennings** of the Freshwater Society presented "**The Geology of Lake Minnetonka**." **Deborah Naffziger** staffed a table with our State Fair rocks and handouts. The council chambers were close to capacity, as all 120 tickets for the event had been reserved. By a show of hands, I estimate 20% of the audience was GSM members, so this was a great opportunity to spread awareness of our organization. **Joe Wright** and **Lowell Hill** recorded the event, so it will be available later on the GSM YouTube channel. Photos appear elsewhere in this issue. Thanks to all who made this special event possible. A highlight of January was our winter party, generously hosted on the 17th by **Frank & Roxy Janezich**. The party was potluck and all attendees brought tasty dishes from



GSM President,
David Wilhelm

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GSM Field Trip to Copper Falls State Park, Wisconsin, 1940.



appetizers to desserts. Roxy reported that about 30 members attended. A few photos of the event appear in this issue. Hosting such a party takes considerable effort, and I personally want to thank the Janezichs for again stepping up to keep this fun GSM activity alive.

And a special thank-you to **Joanie Furlong**, our membership chair, for maintaining our database of members. Each of you should have recently received a copy of our printed 2026 Membership Directory; Joanie has been putting those together for many years so that we can easily stay in touch. If you see any errors or your information has changed, please let Joanie know as soon as possible.

Once again, the **Institute on Lake Superior Geology (ILSG)** is hosting its annual meeting and field trips, this year in Thunder Bay, Ontario on May 20-23. Although primarily aimed at geology professionals and students, I and other GSM members have found these quite interesting in past years. Full information is at <https://www.lakesuperiorgeology.org/ThunderBay2026/>.

Finally, a thank-you to our Newsletter editors, **Kate Clover, Mark Ryan, Harvey Thorleifson, and Rich Lively**. This publication is by GSM members for GSM members, so consider submitting an article about a place you visited, a geological experience from your childhood, something you read, or whatever you think might interest your fellow enthusiasts.

David Wilhelm

GSM

2026 Board of Directors:

David Wilhelm, President
 Mary Helen Inskeep, Vice President
 Dan Japuntich Treasurer
 Stephen Willging, Secretary

Board Members: Wolfgang Bielefeld; Dick Bottenberg; Kate Clover; Javier Guzman; Lowell Hill; Mary Helen Inskeep; Dan Japuntich; Dave Wilhelm; Stephen Willging

Field Trip Coordinator: Joe Newberg; David Wilhelm

Geological Markers: Dick Bottenberg (chair); Alan Smith; Rebecca Galkiewicz; Dan Japuntich

GSM Outreach: Open

Lecture Recording: Dick Bottenberg; Lowell Hill; Joe Wright

Liaison Officer: Dave Wilhelm

Membership: Joanie Furlong
Newsletter: Kate Clover; Mark Ryan; Harvey Thorleifson; Rich Lively
Programs/Lectures/Labs: Steve Erickson
State Fair/Rock Shows: Patrick Pfundstein
YouTube Administrators: Patrick Pfundstein
Meet-up Organizers: Mary Helen Inskeep, Dick Bottenberg
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, kclover@fastmail.fm 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 and Zoom meetings are from 7 - 9 pm. Meeting location will be announced close to the meeting date. 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 David Wilhelm, dewilhelm53@msn.com

Welcome New Members!

Ginny Black, Plymouth
 Carrie Kroll, Mpls
 Total number of GSM Members: 162

Notes from the Past

From the May-June 1973 edition of GSM News

Special Projects Committee has Work in Progress:

The Special Projects Committee, under the chairmanship of Sam Mayo, has a number of activities in progress. Work has been started for a special geological display at the Northwoods Audubon Camp near Sandstone. Examples of the various types of Minnesota bedrock need to be collected for it, and Mr. Mayo would like any samples you can contribute.

At Fort Snelling State Park an exhibit of the geological history of the area will be prepared. Also, the Committee is organizing volunteers to act as tour leaders to Park visitors,

A self-guided nature trail for the Taylor’s Falls area also is being planned and written. This is being done in cooperation with the Minn. Department of Natural Resources, and will be available to visitors at Interstate Park.

[As a follow-up, does anyone know if any of these projects were completed and what of their current status?]

In Memoriam



Edna Kathryn (Pierre) Schoenecker

Edna Kathryn (Pierre) Schoenecker, 92, long-term resident of Chanhassen/Excelsior, born in St. Paul, Minnesota, passed peacefully in her home, January 1, 2026, surrounded by her loving family. She was preceded in death by her husband Thomas Joseph Schoenecker. They are missed.



Professor Paul Weiblen

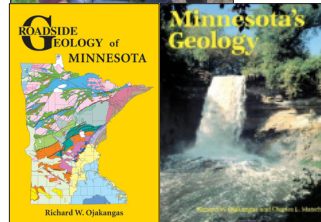
Professor Paul Willard Weiblen, 98 years old, died peacefully in the presence of family on Tuesday, December 23, 2025 in St. Paul, Minnesota. He was born on February 15, 1927 in Miller, South Dakota to Anna Bellin Weiblen and George Daniel Weiblen. He was a lifelong learner and seeker of

knowledge. He joined the Army in 1945 and served during the occupation of Germany. Thanks to the GI Bill, he earned a bachelor's degree in History from Wartburg College and a master's in European History from the University of Minnesota. He served the Defense Department during the Korean War and afterward worked for American Express in Istanbul, Turkey. Upon returning to the United States, he earned his bachelor's, master's, and PhD degrees in Geology at the University of Minnesota. Paul married Katharine (Katie) Busch in 1967. He joined the University faculty, teaching Minnesota geology and characterizing the minerals of the Duluth Complex with the Minnesota Geological Survey. He worked on the lunar samples from the Apollo missions and directed the University's Space Science Center. He retired in 1997 and continued his relentless pursuit of knowledge on campus as Professor Emeritus. Paul was a storyteller and never ceased to engage others in learning about the past and looking to the future. He appreciated the years of support he received from the Minneapolis VA Hospital and donated his body to the University of Minnesota Anatomy Bequest Program. He is survived by his wife, Katharine Weiblen, son, George Weiblen, daughter, Ann Weiblen Marchant, daughter-in-law, Rebeca Montgomery, son-in-law, Tyler Marchant, grandson, Carl Weiblen, granddaughter, Caroline Weiblen, and sister-in-law Betty Weiblen.

Professor Dick Ojakangas



Dr. Richard (“Dick”) Wayne Ojakangas died peacefully in his sleep during the early morning hours of December 16, 2025 at the age of 93. He was in his home overlooking Lake Superior in Duluth, Minnesota, where he lived with his beloved wife of nearly 70 years, Peaches, and his son Gregory,



who was his devoted primary caregiver. He remained cheerful and positive to the end in spite of his declining physical health over several years due to complications related to Parkinson’s disease.

Dick was born November 20, 1932, in Moose Lake, Minnesota, and grew up in Kettle River and Warba. He

was very proud of his 100% Finnish heritage. After graduating from Grand Rapids High School, he enrolled as a business major at the University of Minnesota Duluth (UMD), intending to take over the family store in Warba after graduation. However, during his senior year, he took an introductory geology class from Dr. Robert Heller, and switched his major after the first lecture to geology. He joined ROTC (Reserve Officer's Training Corps) because he felt it was his patriotic duty to serve his country. After graduation, he was assigned to the USAF base in Upper Heyford, England. He married Finnish beauty Beatrice (Peaches) Luoma and they moved to England within one week after their wedding. Due to his geological expertise, Dick was assigned to be a Petroleum Supply Officer, fueling jets with highly toxic JP4 jet fuel.

After two years in the Air Force, he continued his studies in geology, earning a master's degree from the University of Missouri, and a PhD from Stanford University. Returning to Duluth, "Dr. OJ" enthusiastically taught geology at UMD for 38 years, where he was beloved by many hundreds of students. Dick was renowned as an entertaining and exceptional geology professor. He began each lecture with a Finn joke, and the punchlines were meticulously written on his calendar. His colleagues in the Geology Department were also his extended family and lifelong friends. He retired in 2002.

Dick wrote or collaborated on more than 60 scientific publications and several books, including the highly acclaimed *Minnesota's Geology*, and *Roadside Geology of Minnesota*. He was awarded the prestigious Horace T. Morse Award for Distinguished Teachers from the U of MN, and received an honorary PhD from the University of Helsinki, Finland. Dick was a passionate traveler and photographer, doing geological research on all seven continents. His work in Antarctica as part of the United States Antarctic Research Program (USARP) resulted in a mountain being named after him, Mount Ojakangas. In India, he found the first Archaean age (2.7 billion years old) glaciation ever discovered. And in Finland, he and a colleague were the first to determine the direction that glaciers moved through Northern Europe. As a world-respected geologist and an engaging, highly understandable speaker, he spread his enthusiasm for science by giving lectures on cruise ships from 1978 to 2017, feeding his obsession with traveling the world and amassing an exorbitant number of Frequent Flyer miles.

Curious and inquisitive, Dick entertained many interests and hobbies. He lived an active life - running several Grandmother's Marathon's (all without training) and cross-country skiing (doing the Birkebeiner 54 km race in Wisconsin many times, also without training). Dick was an avid mushroom hunter on all continents where Chanterelles and Boletus could be found and loved to teach his family and friends about this hobby. His wife, Peaches, stated that he could 'find mushrooms, whether they were there or not!' Known for his generosity, humor, and warm personality, Dick made sure everyone

felt included and always sought out strangers, who promptly became his friends. His trademark greeting "Hiya!" and farewell "Cheers!" are remembered fondly by his family and friends. He loved to showcase Duluth and introduce the breathtaking beauty of Lake Superior to geologists from around the world. He relied on his beloved wife, Peaches, to prepare meals for them, often without much notice. His kindness and compassion extended to all living things. He loved all animals, releasing house flies rather than killing them, and never allowing hunting at their country home, which was affectionately dubbed "Dick's Nature Preserve."

He was an active member of First Lutheran Church in Duluth, where he knew everyone, sang in the choir, served as president, and visited the homebound. Recognizing the need to serve the less fortunate, he helped to found Chum Ministries in Duluth. Dick is survived by his beloved wife of nearly 70 years, Beatrice (Peaches) Ojakangas, his daughters Catherine (Christopher Kozak) and Susanna (Wilmer Roballo) and son Gregory Ojakangas (Melanie Sever), brother Dennis Ojakangas, and grandchildren Nikolas, Tomas and Isabella Friehs; Kieran, Celka (Christopher Vezzuto) and Lian Ojakangas; and Kaisa and Frans Elliott. Dick was able to live the last years of his life at home surrounded by the love and energy of his family. Thanks also to Ecumen Hospice for their kindness and guidance during Dick's final weeks.

Winter – Spring 2026 GSM Lecture Schedule

Geological Society of Minnesota (GSM) lectures are on Mondays at 7pm CT. Schedules are subject to change; always check online at www.gsmn.org before attending. Registration not required for in-person lectures. In-person lectures are held at the University of Minnesota, Keller Hall, Room 3-230.

On-line lectures are presented via **ZOOM**; these require free registration via the "Contact Us" tab on the GSM website prior to the talk (ask for a Zoom link). Members, watch your email for the link.

February 2, 2026: "The Role of Snowball Earth Events in Bedrock Weathering." ****Online Lecture.**** *Mark Jirsa, M.Sc., Minnesota Geological Survey (retired).*

February 9, 2026: "Hematite Ore Formation in the Lake Vermilion-Soudan Underground Mine State Park, Northeastern Minnesota." ****Online Lecture.**** *Zsuzsanna Allerton, Ph.D. Candidate, University of Minnesota.*

February 14, 2026: (Saturday Lab, 10 am – noon at Macalester College): "Rocks and the Minerals that Define Them - an Exploration of Minerals that Make Up Common Rocks." *Jeff Thole, M.Sc., Geology Laboratory Supervisor and Instructor at Macalester College.*

February 23, 2026: "Integrating GIS & Geoscience: A Capstone Project on Geology of the Ice Age Trail." ****Online Lecture.**** *Lisa Siewert, M.Sc., Senior Lecturer, University of Wisconsin Stevens Point.*

March 9, 2026: "Geologic Hydrogen, Abiotic Methane, and Volume Changes Associated with Aqueous

Alteration of Mantle Rocks in Submarine Environments." ****Online Lecture**** *Frieder Klein, Ph.D., Associate Scientist, Woods Hole Oceanographic Institute.*

March 23, 2026: "How the Midcontinent Rift nearly split ancient North America apart 1.1 billion years ago—and why it stopped." *Nick Swenson-Hysell, Ph.D., Associate Professor, Earth & Environmental Sciences, University of Minnesota.*

April 6, 2026: "Oxide Ultramafic Intrusions in Minnesota's Midcontinent Rift - What They Are, How They Form, and a Potential Environmentally Conscientious Processing Scheme to Produce High Value Critical Metal Products." *George Hudak, Ph.D., Adjunct Professor, University of Minnesota.*

April 20, 2026: "My Adventures in Glacier Bay." *Kent Syverson, Ph.D., Professor, Geology and Environmental Science Department, University of Wisconsin, Eau Claire.*

May 4, 2026: Spring Banquet (location, title, and presenter TBA)

Institute for Lake Superior Geology 2026

The 72nd meeting of the Institute for Lake Superior Geology will be held in Thunder Bay, Ontario at Lakehead University on May 20 and 21, 2026. Field trips are planned for both May 19th and 22nd before and after the technical sessions. Check the website for info on the planned fieldtrips. The meeting website is up and running. (<https://www.lakesuperiorgeology.org/ThunderBay2026/index.html>)

The Geology of Lake Minnetonka: A Presentation by Dr. Carrie Jennings

Sponsored by Lake Minnetonka Historical Society



Attendees at the Geology of Lake Minnetonka presentation.

Thanks to Dick Bottenberg for spearheading the effort, GSM partnered with the Lake Minnetonka Historical Society to host 105 attendees at the Wayzata Community Center for a presentation by Dr. Carrie Jennings of Freshwater about the Geology of Lake Minnetonka on the evening of January 15, 2026.



Joanie Holst Dave Wilhelm

After a welcome from Joanie Holst, the vice president of the Lake Minnetonka Historical Society, Dave Wilhelm welcomed everyone on behalf of GSM and then handed the microphone to Steve Erickson to introduce Dr. Carrie Jennings.



Steve Erickson

Dr. Jennings has been Research and Policy Director at Freshwater since 2016 after having been a field geologist for 24 years, 22 of those with the Minnesota Geological Survey and two with the DNR, Division of Lands and Minerals. She also served as

the science reports lead for the County Geologic Atlas program at the DNR for 2 years. She has been Adjunct Graduate Faculty in the Dept. of Earth and Environmental Sciences at the U of M for 30 years. She applies her understanding of glacial geology and landscape evolution to shape policy and technical approaches for managing surface water and groundwater, avoiding hazards, and using resources wisely.

Dr. Jennings began by linking her presentation to the GSM geological marker located in Excelsior. She went through each of the sections discussed on the marker and then expanded on the geology and history of Lake Minnetonka and Minnesota.

In addition to Dr. Jennings presentation, GSM had a table at the entrance, staffed by Deborah Naffziger, with our rock display normally used for the State Fair booth plus a new poster with information on our geological markers.

Lowell Hill and Joe Wright videoed the presentation and will prepare it for upload to the GSM YouTube page.



Dr. Carrie Jennings spoke about the Geology of Lake Minnetonka



GSM marker (left of entryway arch)



Steve Erickson, Dr. Carrie Jennings, and Dave Wilhelm at the GSM welcome table

Joe Wright

GSM Winter Party, Jan. 17, 2026

Photos by Lowell Hill (except as noted)



Generous Hosts: Roxy and Frank Janezich



GSM members filled Frank and Roxy's house (Kate Clover)



Steve Erickson and new member Roger Sharpe



Rosemary Ernst-Itschmer and "Ernie" John Ernst seated with Dave Wilhelm



(l to r) Deb Preece, Dan Japuntich, Dorothy Edelson and Ly Preece; at fireplace: Marilyn Nelson and Larry Kalina



Mary Helen Inskeep, Kay Smith and Aldo Ramos



Marilyn Nelson, Larry Kalina and Sandy Steffner



Nancy Halvorson, Diane Lentsch, Roxy Janezich



Joe Newberg and Randy Strobel



Diane Lentsch, Mary Helen Inskeep, Rosemary Ernst-Itschmer and "Ernie" John Ernst sampling the foods. Carol Hill at the counter. (Kate Clover)



(l to r) Carol Hill, Kate Clover, Steve Erickson and Roger Sharpe

Presentation on Fossils of Minnesota

by Justin Tweet

On Wednesday, November 12, 2025, Justin Tweet, representing the Geological Society of Minnesota, gave a presentation on the fossils of Minnesota for a 55+ education group. It was held at the Thompson Park Activity Center in West St. Paul. Attendance was strong, with a group of 20, who asked many excellent questions throughout. The program started with a PowerPoint presentation highlighting the state's fossils ranging from the Precambrian, Paleozoic, and Cretaceous, to the Quaternary, with special focus on the abundant and well-known fossils of the Late Ordovician found from the Twin Cities to the southeast corner of the state. After this, Tweet had a table of fossils for hands-on learning, with plenty of local Cambrian and Ordovician fossils plus some stand-ins to represent Cretaceous and Quaternary fossils. Thank you to Tim Johnson of the Thompson Park Activity Center for the invitation!



Presenting at the Thompson Park Activity Center



Local Cambrian and Ordovician fossils

Cincinnati's Museum Center and Fossils

by Mark Ryan

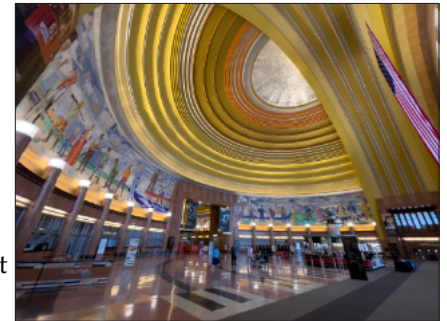
All photos by Mark Ryan unless otherwise noted.

During a 2024 trip to Cincinnati, Ohio, I took some time to revisit the Cincinnati Museum Center, a museum complex I had first visited two years earlier. The center occupies the



The Cincinnati Museum Center.

recently restored Union Terminal, a railroad depot built originally in 1933. The building's exterior is impressive enough, but when you enter the lobby you're met with a stunningly beautiful Art Deco ceiling – the largest half-dome in the Western Hemisphere – composed of an array of large colorful circles looming over a series of beautifully restored mosaics depicting several local businesses and industries. Union Terminal still operates as a train depot but only for a couple Amtrak trains each day. The museums are the attraction now drawing 2 million visitors each year. Three museums occupy the space: one covering Cincinnati's history (with a terrific 1930s model train layout of downtown Cincinnati), a children's museum, and a natural history museum. A single ticket gets you into all three museums, but I was there for the Center's Natural History & Science museum.



Cincinnati Museum Center lobby.



The Galaemopus skeleton greets visitors as they enter.

Dinosaurs dominate the first level of the natural history museum including among others, a Torvosaurus, Daspletosaurus, and Galaemopus, a long-necked sauropod related to Diplodocus. The skeleton of Galaemopus was discovered in Montana in 2001 and excavated by the museum. It took 18 years from discovery to display, including over seven years of preparation in the museum's lab. The Cave exhibit, as the name suggests, lets you experience exploring a limestone cave like those you'd find in the area around



Not one but two Torvosaurus skeletons.



The Daspletosaurus skeleton and skull.

southern Ohio and Kentucky. I've been to Mammoth Cave so it was hard to match that experience inside a museum exhibit.



Glacial cave leading into the Ice Age exhibit.

But a similar and more expansive and interesting Ice Age exhibit takes you through a glacial cave that leads you into a number of open spaces where you come face-to-face with life-size models and skeletons of Ice Age animals that once populated the area. These included the giant bison, mastodon, saber-toothed cat, and giant sloth. I'd imagined Minnesota's new official state fossil, the



Ice Age fauna. TOP: Saber-toothed cat and kittens; LEFT: Mastodon; MIDDLE: Giant Sloth; RIGHT: Giant Bison.

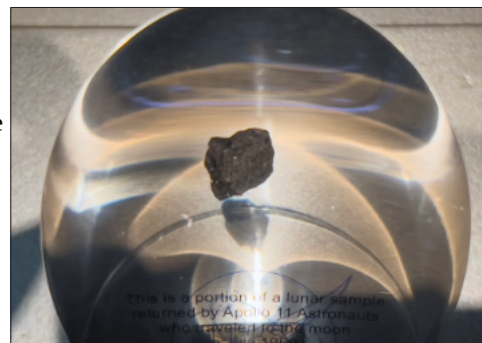


Neil Armstrong display.

giant beaver, being somewhere in the exhibit since it was first discovered in Ohio, but I didn't see it.

For those, like myself, whose interests reach beyond the bounds of Earth,

the Neil Armstrong Space Exploration gallery offers information and artifacts about the first Apollo Moon



The moon rock donated by Neil Armstrong.



Ancient Worlds Hidden in Plain Sight exhibit entrance. Photo by Nick Ryan.

landing (July 1969), including a piece of moon rock from Tranquility Base collected and donated by Ohio's own Neil Armstrong, the first human to walk on the Moon. Moon rocks and glaciers, of course, are impressive and dinosaurs are just about everyone's favorite prehistoric creatures, but the real reason for my return visit was to



Photo by Nick Ryan.



Mass of crinoid fossils.



Fossil Eurypterid.

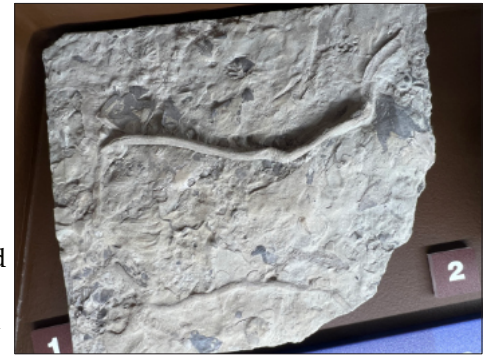


Fossil bryozoans.

This is due to a large anticline known as the Cincinnati Arch, an area of uplift that started in mid-Devonian times and continuing off and on between erosional and depositional events until the Mississippian Period. The

see the recently opened Ancient Worlds Hiding in Plain Sight exhibit, showcasing Ohio fossils from the Ordovician to Carboniferous periods. Having grown up collecting (and still collecting) Ordovician fossils in Minnesota, I was particularly interested in the fossils from that time period. The Ordovician exposures in Cincinnati and surrounding areas are world famous and loaded with marine fossils similar to those found in Ordovician rocks in southeastern Minnesota, but the Cincinnati series fossils are a bit younger and generally larger and much better preserved.

arch rises between several basins in neighboring areas of Ohio, Indiana, Illinois, and Kentucky. Later erosion of the arch exposed buried, older strata composed of limestones, shales, and mudstones laid down during the Late Ordovician (472-461 mya) when, much like Minnesota around that time, the area was located south of the equator and covered by shallow tropical seas. Many of these



Planolites sp – feeding burrow of a worm-like creature.



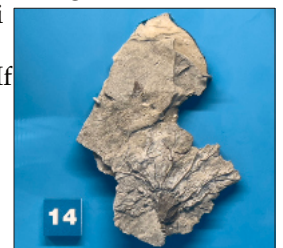
The trilobite *Isotelus maximus*, Ohio's official state fossil.



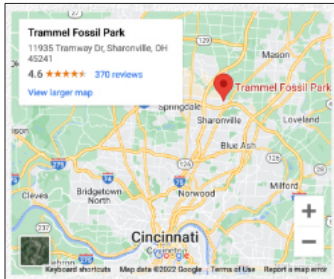
Worm burrow leading into the mouth of a trilobite. sedimentary rocks are rich in marine fossils.

It should be noted that in 2019, around the time that the Bell Museum moved to their new digs in St. Paul, the University of Minnesota shipped its collection of Minnesota fossil invertebrates (including several holotypes) down to the Cincinnati museum. They had long been stored in the old Bell's basement. If they had to be sent anywhere, I suppose Cincinnati was the best place for them.

Dr. Brenda Hunda, the museum's curator of invertebrate paleontology, did a wonderful job creating the display of locally



Glyptocrinus nodosus specimen discovered by Jack Kallmeyer.



Google map showing Trammel Fossil Park location.



Trammel Fossil Park entrance.



The park's expansive fossil fields.



Sign marking the top of the Bellevue formation.

A longtime amateur collector, Kallmeyer is also a member of Dry Dredgers, a



Information plaque at Trammel Fossil Park.

found Ordovician fossils. Some were found by amateurs, and each collector was credited for their discoveries, adding value to the concept of public science.

Exhibit highlights include some excellent examples of typical Ordovician fauna: brachiopods, bryozoans, crinoids, and a beautiful eurypterid specimen. Eurypterids, also known as sea scorpions, were a longtime mystery until near complete specimens were found in the Cincinnati strata.

Trilobites, everyone's favorite fossil (including Dr. Hunda's) are a common fossil found in the local rocks. *Isotelus maximus* is one of the largest and Ohio's official state fossil. Another unusual specimen on display shows a worm burrow leading right into the mouth of a trilobite, hinting that the worm may have been the trilobite's last meal.

A good example of citizen science is a new crinoid species called *Glyptocrinus nodosus* discovered by Jack Kallmeyer, who calls it the most scientifically important fossil he's ever found. A longtime amateur

local organization dedicated to collecting and advancing the study of Cincinnati fossils. His discovery has added greatly to the knowledge of that particular group of crinoids.

Seeing what's locally available may make you anxious to get out and collect some fossils of your own. Driving around the area, especially coming in from the north, you can see some enticing, beautiful exposures of layered shales and limestones along the interstate highways leading into Cincinnati, but as you can imagine, these are inaccessible. However, luckily there are collecting locations where traffic laws aren't an



A couple good-sized brachiopods in hand.



Shell-hash plate packed with fossils.

issue.

In my three or four visits to Cincinnati, I've had only a little time to do actual fossil hunting in the area. But in a recent visit, after my two sons and I had visited Big Bone Lick State Park across the river in Kentucky (recommended and possibly a future article), we scoured a road cut just outside the park entrance, and found a few scrappy fossils. However, it was brutally hot that day and not very enjoyable so we didn't stay long.

We had a better time and better luck a couple days later at the excellent Trammel Fossil Park in Sharonville, Ohio, just a 25-minute drive northeast of downtown Cincinnati.

This easy-access, 10-acre semi-wooded park has parking, porta-potties (April 1 - September 30), multitudes of information signs explaining the park's history and identifying the strata and marine



Small plate of brachiopod and crinoid remains.



Slab of *Rafinesquina?* brachiopods.

fauna found there. There are no indoor facilities on-site, but why would anyone want to be indoors at such a place? Four different formations are exposed in a gentle slope just off the

parking lot, and span a good 60-80 yards across and maybe 30 yards upslope to its highest elevation.

It's one of those sites where just about every rock you pick up contains fossils of some kind. Several information plaques explain the local strata and types of fossils you can expect to find in each layer. The Fairview Formation is at the base, overlain by the Miami town Shale, then the Bellevue Formations, and finally by the Corryville Formation at the top. Signs on the hillside exposures also mark the top of each of the four formations.

Each layer is fossiliferous, filled with bryozoans, brachiopods, gastropods, crinoids, pelecypods, and in the case of the Corryville, trilobites, all are Late Ordovician in age.

We immediately began searching for fossils and weren't disappointed for a second. I found some nice individual brachiopods and a small slab with more brachiopods and some crinoid remains.

The air heated up at times whenever the sun peaked out from behind the approaching rain clouds, but we had plenty of time before the rain started. Just as in Minnesota, when the Ordovician shales become wet, they transform into a very sticky and hard-to-remove muck and can become very slippery.

This fossil-rich parcel of land was preserved by local developer R.L. Trammel specifically for fossil collecting. Over the years, Trammel had noticed how several school groups – some from as far away as New York – would visit the area looking for fossils. Trammel, who had developed much of the area around Sharonville set aside 10 acres of undeveloped property that included the fossil exposures and donated it to the city of Sharonville to be preserved as a fossil collecting site for the public. Small field trip groups are welcomed as well.

As the rain began, I pried out one last, good-sized slab from the base of the Miami town Shale. Once I got back to our apartment and cleaned it up, it proved to be my best – a decent-sized plate of brachiopods (probably *Rafinesquina*) laid out in fine detail.

The best part of Trammel Fossil Park is that collecting there is free, and you can keep whatever you find – within reason, of course. The city requests that a representative sample be taken so future visitors have something to find. The park is open year round from dawn to dusk.

LINKS

https://en.wikipedia.org/wiki/Cincinnati_Arch

<http://www.drydredgers.org>

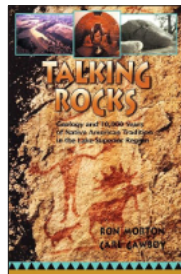
<https://www.consistentlycurious.com/trammel-fossil-park-in-ohio/>

<https://www.sharonville.org/DocumentCenter/View/2976/Trammel-Park-User-Guide>

Book Review

TALKING ROCKS: Geology and 10,000 Years of Native American Tradition in the Lake Superior Region

by Ron Morton and Carl Gawboy. (2003, University of Minnesota Press)



If you are intrigued by the idea that Native Americans were present to observe Glacial Lake Agassiz, Glacial River Warren, massive floods, giant beavers and more, you will enjoy reading this book. If you are interested in learning about 4000 years of Native American copper mining or the geology of the southwest Minnesota pipestone quarries and their associated Native American traditions and myths, ditto. And if you have wondered about the origin and meaning of the Boundary Waters petroglyphs in northern Minnesota, Talking Rocks presents an interesting and plausible theory. And there are many more topics and stories like these to learn about.

The authors, one a geologist and the other a Native American storyteller and philosopher, entertainingly present and compare geologic and historic events. They do so with knowledge from a contemporary scientific view and a corresponding view composed of Native American history, tradition, and myths. They use fictional characters (a University of Minnesota Duluth professor and an Ojibwe Native American elder) as protagonists who present a series of lectures, demonstrations and field trips to dig into the details. This approach works well, although the transitions between lectures and topics are sometimes slow.

There is an important underlying debate between the protagonists that addresses the positive impact geology (mineral discovery, mining and usage) has had in creating our modern civilization vs the negative impact this same geology has had, as "Mother Earth" has been exploited by that same modern civilization. The protagonists' discussions eventually reach common ground, realizing that there is much to be gained when science is in sync with Native American holistic philosophy.

It would be inadequate to simply say that Talking Rocks is a book about geology and its impact on local Native American communities. It is much more. By presenting compelling myths, tradition, history, evidence and science Talking Rocks breathes life into the earth and the geology of the ancient and recent Native Americans of the Lake Superior region.

Dick Bottenberg

Wide View of Trammel Fossil Park



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