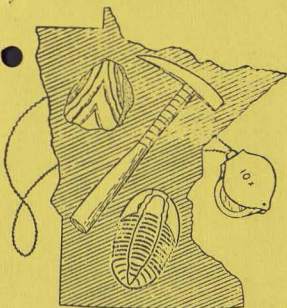


Jan - Feb 1972

# Geological Society of Minnesota



# NEWS



Geological Society of Minnesota

FIRST CLASS



Mr. and Mrs. R.M. Gunville, Editors  
1110 Gardena Ave.  
Minneapolis, Minn. 55432

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3034-46th Ave. So.  
Minneapolis, 55406

January-February, 1972

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GEOLOGIC PLAQUES

TABLET INSCRIPTION #20  
Geology of Minnesota

Glenwood Region

The view from this point reveals the effects of major glaciation in its most vigorous form. Some 10,000 years ago, as the last glacier receded slowly to the north and west, it paused here long enough to deposit, in characteristic pattern, the rock material in the recessional moraine that forms the hills around Lake Minnewaska. The basin of the lake is chiefly within the moraine itself, but on this, the northeastern side, it was bounded by an extensive outwash plain.

The part of the glacier that filled the lake basin became detached from the main body of ice and remained stagnant for many years. During this time it was partially or completely buried by outwash sand and gravel and carried toward the northeast by meltwater from the main ice field. As a consequence, this portion of the basin has a steep ice-contact slope, formed while the ice block supported the loose materials.

Lake Minnewaska, lying 230 feet below this elevation, is a typical example of a lake in an ice-block basin.

Location: Wayside Park on T.H. 55, about 1 mile northeast of Glenwood.

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TABLET INSCRIPTION # 21  
Geology of Minnesota

Lake Agassiz

Toward the close of the last Wisconsin stage of glaciation about 10,000 years ago, the ice front receded from Central Iowa toward the north and, in the latitude of Browns Valley, crossed the continental divide between the Mississippi River and the drainage to Hudson Bay. After the glacier had retreated north of this divide the meltwaters, unable to follow the natural drainage northward, were confined between the ice and the divide to the south.

Thus Glacial Lake Agassiz was created. At its maximum it was 600 feet deep and larger than the combined area of the five great lakes today.

The outlet of the lake was at Brown's Valley. There the Glacial River Warren had its source and carried the overflow from the lake through the valley of the present Minnesota River. When the northern ice eventually melted away the impounded water escaped to Hudson Bay and left behind on the floor of Lake Agassiz the lake sediments which are now the rich soils in the Red River Valley Region.

Location: East of Moorhead on U.S. 10 Buffalo River park at Hawley.

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LECTURE SERIES

- January 10 Mr. Roland Mohr "Introduction to Lunar Geology: Part I"  
January 24 Mr. Norman Evensen "Introduction to Lunar Geology: Part II"

Mr. Mohr and Mr. Evensen are both Research Associates at the University of Minnesota for NASA grants, with information on the latest Apollo research; and their lectures will deal specifically with the origin and evolution of the moon.

"The surface of the moon, unprotected by any atmosphere and unaffected by erosive processes, presents an uninterrupted and unmodified record of all the events that have happened in this part of the solar system since its formation 4,600 million years ago. Although the earth was formed at about the same time as the moon, the oldest rocks exposed on its surface are no more than 3,500 million years old. There is no remaining record on the earth of the first 1,000 million years of its history. Therefore the moon rocks and structures provide invaluable evidence which spans these 'dark aeons' in the history of the earth-moon system and is of unique interest to astronomers and earth scientists alike. . . .

"In contrast to the moon, the earth exhibits a cosmic face of almost eternal youth, continuously rejuvenated by geological processes of erosion and denudation and probably by continuous continental movement and consumption of its ocean floors. All these processes indicate an active mechanism, a heat engine within the earth. Very few parts of the earth's surface, or of its ocean floors, are older than a few hundred million years. The moon, on account of its small mass and heat capacity, can afford none of these cosmic cosmetics to make up her face. Her face truly mirrors the ages gone by and preserves a record of events that occurred long before our own terrestrial continents were formed and long before the first manifestation of life on earth flickered in our shallow waters. As a record of the past, the moon constitutes the most important 'fossil' in the solar system, and an interpretation of the hieroglyphs engraved by Nature on her stony face holds a fascinating story as yet only partly unravelled."

From "The Earth-Moon System" by Zdenek Kopal, Understanding the Earth, The M.I.T. Press, 1971

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An old legend tells of a saintly man who died and went to Judgement. Being a saint he was also humble, and not sure of his reception. To the Almighty, therefore, he recited with breathless haste all the deeds he could think of that were good. These were many, and he did not pause till of necessity, when out of breath. Taking this chance the Almighty asked him, wistfully, "But what did you think of my beautiful world?" Alas, the man had had no time to look at that.

" . . . " . . . " . . . " . . . " . . . " . . . " . . . " . . . " . . . "

PRESIDENT'S MESSAGE

GREETINGS, and a HAPPY NEW YEAR to all members and friends of the GEOLOGICAL SOCIETY OF MINNESOTA:

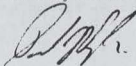
As your new President, I find this an opportune time to share with you some of the concerns and expectations I have for the Society for 1972. The direction and goal of the Society has been long established by its charter -- "to promote interest in geology." The Society membership, through a survey this past fall and the assistance of the Planning and Evaluation Committee, has made suggestions as to where and how we should be going in the immediate future. We need your continued input and support, as well as your real efforts, to carry out these recommendations and programs.

A definite attempt to make the Society a more participative organization and to share the responsibilities with the membership has been initiated; and committees have been established with leadership from the Society to take the main responsibility in achieving the various Society tasks and functions. Hopefully, each of you will respond by carrying out your share of the responsibility.

I sense a continued need to express our commitment to "promote interest in geology"; to communicate our ideas and concerns; to formally plan our programs; to make improvements; and to realistically evaluate how well we have achieved our objectives.

At this time, with a high interest in ecology, geology has a special public interest; and the Society should respond to this challenge. Ours is a rich past history and tradition in the Society, from which we can now proudly work toward responding to the growing community interest in geology.

Let's dwell now on what and how well we are doing, and on our future plans. I hope that, as President, I can provide the necessary leadership to the Society and your interests. Our Board of Directors meetings are open, and I expect that committees and the general membership will, from time to time, attend to serve in a constructive way to improve our Society's business. I do not want to detract from our fun of learning and studying about geology; but I do want to maximize our limited resources so that our Society will continue to build and grow in what I feel is an extremely interesting, rewarding experience and fellowship.



1972 DUES ARE PAYABLE -- HELP US BY GETTING YOUR DUES IN NOW!

MEMBERSHIP CHAIRMAN: Mrs. Marjorie McGladrey  
2040 Skillman Ave. W.  
St. Paul, 55112 (631-0237)

# Board news — briefly

The Board of Directors elected Beverly Vogt to fill a vacancy on the Board created by the resignation of Lorraine Stone. Ethel Swanson was appointed secretary. The 1972 Board begins its term in January.

Board meetings will be held at 7:30 p.m. on the third Tuesday of each month, at the office of Mr. Vogt, 605 4th Ave. S., Minneapolis. These meetings are open, and members are invited to attend.

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## NEW MEMBERS WELCOMED

A list of new members to the GSM includes the following people. A special welcome is in order.

Mrs. S.S. Benson  
Carol Elvidge  
S. Mary Christina Gilbang

Anthony H. Just  
Sonia Kania  
Virginia R. Knapp  
Mrs. Ruth K Koontz

Julia Leitzke  
Paul E. Opheim  
S. Bernadine Riske  
Donna Ritzl

Glenn R. Rose  
Jan Tepel  
Helen D. Woodward



74  
72

## FORMER GSM MEMBER ILLUSTRATES NEW BOOK

Miss Wilma Monserud, illustrator of a new book on Minnesota wild flowers, was a long-time member of the GSM. She retained her membership in the Society until she moved to South Dakota. Her artistic talents were appreciated when she did the table decorations for some of the recent banquets.

## Common Wild Flowers of Minnesota

Illustrations by Wilma Monserud  
Text by Gerald B. Owmby

A superbly accurate, dalkately illustrated guide to over 300 regional wild flowers of Minnesota and nearby states. Each page contains a detailed pen-and-ink drawing with accompanying descriptive text. This delightful book, compact enough to take along on a walk, is arranged alphabetically, with an index to common names. \$9.75

University of Minnesota Press

The father of geology was he who, seeing fossil shells on a mountain, conceived the theory of the deluge.

Samuel Butler (II)

CUYUNA IRON RANGE  
Sagamore Mine

by Elmer Brown

Riverton Village - Irondale Township - Cuyuna Range NE $\frac{1}{4}$ , SE NW, N $\frac{1}{2}$ -SW, SE-SW&NWSE, Sec 19, T46 R29 (500 acres in area).

Any story of the mines of the Cuyuna Iron Range would not be complete without including a short history of the Sagamore Mine. It had the largest deposit of brown manganese ore in the district. In the beginning the manganese ore was wasted because of objections by the steel makers. Later this policy was changed when it was found that the manganese made a valuable alloy as well as a deoxidizer and desulfurizer with the iron in steel making, and resulted in premiums being paid for the manganese ore. Much that was wasted was recovered.

Ore from this mine was very high in moisture content and resulted in early beneficiation. At an early date a drying and crushing plant was erected which was the largest in the U.S. Three rotary type kilns consisting of revolving steel tubes 10 ft. in diameter and 78 ft. long were placed in operation. Crushed and screened ore was passed through these tubes, heated from a furnace near the tubes by forcing hot gases through the stationary inner tube, and then pulled back by suction. Two tubes were in continuous operation and one held in reserve. Moisture content was reduced from approx. 20% to 10%. The ore shipped contained approx. 36% iron and about 8% manganese. The normal production from the two tubes was 1500 tons per shift, 3800 tons in 24 hrs. The exact drying time varied with moisture content. Although a tremendous heat was generated in the furnaces, the heat in the tubes was not allowed over 1300°F. so that ore did not become dusty.

This mine was opened for shipping in 1919 and the mine was developed by hydraulic sluicing and steam shovel, waste being carried to the nearby Mississippi River. This work was carried out by the Winston Bros., contractors.

In this stripping operation a slab of native copper was found (1884 lb.) 3 ft. wide by 6 ft. long, with flecks of silver and covered by glacier striae, indicating it had been moved by glacier probably from the Keewatin glacial center. It now reposes in front of the School of Mines of the Univ. of Minn. Also on the same stripping operation, large quantities of bison horns and caribou antlers were uncovered and sent to the Smithsonian Institute. Geologists there claimed they belonged to species out-dating those of modern age.

The ores in this mine occurred in two shallow intersecting synclines, the maximum length of the deposit being about three-quarters of a mile and lying in a NE and SW direction. However, at present this entire area is filled with water. The last record which I have shows a record output for this mine of 408,847 tons in 1937. In 1956, 422,712 tons. The mine was operated at the start by Sagamore Iron Co. (John A. Savage & Co.) 1919-1929 and by Sagamore Mining Co. (Pickands Mathers Co. Agts.) 1928 to date. Up to 1957 a total of 10,554,127 tons were shipped.

The year 1919 was one of the peak years on the Cuyuna Range as indicated by mine statistics as follows: 1919 total mines 44, active mines 19, inactive mines 25, tons ore shipped 2,262,576 cu. yds, stripped 1,707,497 cu. yds., number of men employed 2747. Total tonnage mined (1921 - 1935) - 433,336,583 tons.