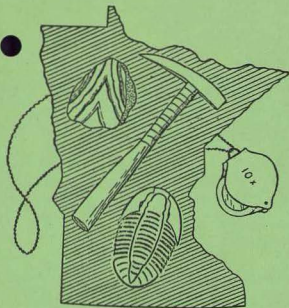


Oct-Nov-Dec 1975



Geological Society
of Minnesota

NEWS



Geological Society of Minnesota

Marcia Gunville, editor
1110 Gardena Ave.
Fridley, Minn. 55432

FIRST CLASS

RETURN REQUESTED

Oct. - Nov. - December, 1975

OFFICERS

PRESIDENT	Dr. Alex Lowe	2206 Caroline Lane, So. St. Paul	451-2822
VICE PRES.	Dr. J.S. Lewis	2186 Draper Ave., Roseville	633-8704
SECRETARY	Sallie Lewis	2186 Draper Ave., Roseville	633-8704
TREASURER	John Snell	8241 Deer Pond Court, Lake Elmo	777-1214
DIRECTORS	Fred Bradford	1673 Delaware Ave., St. Paul	451-2611
	Irene Carlson	8036 60th St., No. Stillwater	777-5779
	Robert Gunville	1110 Gardena Ave., Fridley	574-1421
	Sr. Joan Kain	1035 Summit Ave., St. Paul	225-3000
	John Podolinsky	10226 Mildred Terrace, Minnetonka	544-1457

From THE EARTH, by Raymond Siever
Scientific American, September, 1975

Apollo Astronauts have said that the earth with its blue water and white clouds, was by far the most inviting object they could see in the sky when they were on the moon. Their bias is understandable. They knew from intimate observation what this planet is like and could translate the sight of clouds, oceans and continents into everyday experience--of, say, a sea breeze blowing surf onto a sunny beach.

Probably the thing people like most about the earth, even if they have not put the thought into words, is its pattern of constant movement. On the earth stillness is remarkable for its rarity. Motion extends from the constant shifting of grains in a sand dune and the movement of bacteria and all other forms of life to the ponderous motions of the entire earth as it vibrates during and after an earthquake.

The planet is active. Indeed, it has been active for 4.6 billion years, and it shows no signs of calming down. The earth's atmosphere, oceans, thin crust and deep interior have been motion since they were formed. Life has been an integral part of the surface for at least four-fifths of the planet's history.

As a consequence of its steady activity over this long span of time the earth has evolved through a series of quite different stages, maintaining during the entire time a state of dynamic equilibrium. The balance involves an exchange of matter and energy between the interior, the surface, the atmosphere and the oceans. It also involves sharing the radiation of the sun with the other members of the solar system.....



BOARD OF DIRECTORS

NEWS FROM THE BOARD

Officers for 1976 are Elected

The 1976 Board of Directors has elected its officers for the upcoming year. They are: President, Dr. J. S. Lewis; Vice President, Allen Lundgren; Secretary, Les Collins; and Treasurer, Bob Leacock.

Biographies, by Bob Handschin

The new directors elected at the September Annual Meeting are the following people;

Leslie Collins is employed at the UM College of Pharmacy. He stopped at the GSM State Fair booth and Pearl Downey stirred his latent interests in geology. He has been a member since 1972.

Myrtle Fore teaches home economics at Highland Park Junior High School, St. Paul, and has been in touch with GSM for 20 years or so through her husband Earl. Most of this time they lived too far away to take active part, but for the last 4 years they have been involved in most GSM doings.

Allen Lundgren is a long-time researcher for the U.S. Forest Service, stationed the last 10 years on the St. Paul UM Campus. His contact with GSM came from an interest in rocks from trips West, which brought him to the GSM display at the local rock show. Everything just followed naturally once he and his wife Barbara found out what GSM was doing.

Bob Leacock says he always was interested in geology but a fellow worker at Univac St. Paul plant, Roger Trutna, was a GSM member and invited him to a lecture. That was several years ago, and since then he and his wife have taken a very active part in GSM, putting out the Newsletter, and Bob was a director once before.

John Podalinsky, a science teacher at St. Louis Park High School since 1962, learned about GSM about 5 years ago from two of our lecturers on our winter series, and once he saw the program, he just couldn't stay away. He has finished one term on the Board.

*
* ANNUAL DUES MAY BE PAID NOW *
*
* If you have not yet paid your annual dues, it would help *
* the membership chairman if you would do so soon. *
* Memberships become delinquent after January 1 and reminder *
* letters must be sent out. Prompt payment helps to achieve *
* early publication of the roster. *
*
* You may mail checks to Mrs. Bernice Tepel, 1269 S. Cleveland *
* Ave., St. Paul, Mn. 55116, or you may see her at the special *
* table at one of the general meetings. *
*

WELCOME

NEW MEMBERS:

WELCOME NEW MEMBERS:

Gregory L. Grover
5995 Concord Blvd.
Inver Grove Hgts, Minn.
55075

Dwight Robinson
2307 Brewer St.
St. Paul, Mn. 55108

Mr. & Mrs. Lawrence Schaefer
(Patricia)
1630 W. Skillman Ave.
St. Paul, Minn. 55113

Max H. Zeilig
3412 Oakridge Rd. Apt.319
Minnetonka, Mn. 55343

Mrs. June H. Gretz
4525 Colfax Ave. S.
Mpls. Mn. 55409

Kay Lancaster
1554 Hillside Ave. N.
Mpls., Mn. 55411

Rodney & Peggy Nerdahl
2022 Park Ave. Apt. 308
Mpls., Mn. 55404

Betty Kennedy
2020 W. Eldridge
St. Paul, Mn. 55113

Rayfield Cabaniss
U.S. Bureau of Mines
P.O. Box 1660, St. Paul, Mn. 55111

John G. Lovegren
1445 W. Shryer Ave.
St. Paul, Mn. 55115

Vabel S. Brown
1472 Taylor Ave.
St. Paul, Mn. 55104

Robert Hunt
Box 29071
Brooklyn Center, Mn. 55429

Mr. & Mrs. Orval Dunlap
(Beatrice)
5814 Ewing Ave. N.
Mpls., Mn. 55429

Bethany Ulrey
P.O.Box 1531, Macalester Coll.
St. Paul, Mn. 55105

Vern & Vivian Bloomquist
3809 Zane Ave. N.
Crystal, Minn. 55422

Frances McBride
1330 Wachtler Ave.
St. Paul, Mn. 55118

George Rodgerson
1159 Raymond Ave.
St. Paul, Mn. 55108

Change of Address:

Mary Quinn
4509 Alarich Ave. S.
Mpls., Mn. 55409

Nancy E. Eklund
P.O.Box 379
Macalester College
St. Paul, Mn. 55105

Robert C. Vogel
1775 Jefferson Ave.
St. Paul, Mn. 55105

Melvin A. Olsen
4249 Abbott Ave. S.
Mpls., Mn. 55410

James Dunlap
5814 Ewing Ave. N.
Mpls. Mn. 55429

William Larson
701 Univ.Ave.S. Apt.4
Mpls., Mn. 55414

Eric Waage
13438 Larkin Circle
Minnetonka, Mn. 55343

Tom Kleinart
P.O. BOX 30082
St. Paul, Mn. 55113

Lilith Grant
1159 Raymond Ave.
St. Paul, Mn. 55108

Bruce waage
13438 Larkin Circle
Minnetonka, mn. 55343

WANTED: for Archives Records

Materials for the Geological Society of Minnesota archives! Back issues of the Newsletter, photos, membership lists and rosters, fieldtrip notes are all welcome. The GSM board is in the process of updating society records and would appreciate your contribution. Materials can be brought to the regular Monday lectures and given to, or call, Sr. Joan Kain, 225-3000, for other arrangements.



Some kind of conceptual model is essential for any imaginative kind of interpretation.

DR. SAM KIRKWOOD'S LECTURE SERIES TALKS ABOUT

"Was The Chemical Nature of Living Things Determined by Geologic Processes?"

by Barbara Lundgren

This is the general title for a series of lectures presented by Professor Sam Kirkwood, Dept. of Biochemistry, U of M. Dr. Kirkwood has been discussing with the Society some very interesting ideas on the spontaneous origin of life. This main theme of the present series of talks is the discussion of a new body of evidence that is leading us back to the idea of the spontaneous origin of life. These ideas are radically different in substance from the classical ones on the subject and are based on modern science. Dr. Kirkwood spent most of the first lecture discussing the historical aspects of these ideas, including early Greek and Christian thought. The second lecture was devoted to the theories of the Russian biochemist A. I. Oparin. He discussed two ideas of Oparin, one that there was no possibility that life could form spontaneously in an oxygen atmosphere such as we have today, and secondly, that early atmosphere was instead, highly reducing and one consequence was that it created a situation in which a spontaneous origin of life was possible.

Dr. Kirkwood stated "one of the fundamental tenets of the Oparin theory is now generally accepted as being correct. This is that the appearance of life on earth was preceded by a long period of purely 'chemical evolution' and that this chemical evolution was intimately involved in the eventual origin of life, although the details of this involvement are as yet far from clear."

In the third lecture Prof. Kirkwood discussed the early atmosphere of the earth and the origin of oxygen in the atmosphere. He stressed two points, one that the early atmosphere was of secondary origin, established by volcanic action, and second that the original atmosphere was reducing. He went on to discuss the processes of photosynthesis and photolysis and the probable contribution each has made to the present day oxidizing atmosphere.

His remaining two lectures are on "Chemical Evolution" and "Modern Biochemistry Viewed in Terms of the Geological Changes that Brought It About."

Dr. Samuel Kirkwood was born in Edmonton, Alta, Canada. He received his B.S. from Alberta in 1942, his M.S. from the Univ. of Wisconsin in 1944 and Ph.D. in 1947. He has taught at the Univ. of Minnesota since 1956 as Associate Professor and later Professor of Biochemistry. (Biog. info. from "American Men of Science")

INTERESTING MAGAZINE ARTICLES

There have been a number of geology-related articles in magazines recently which may be of interest to members. These magazines are obtainable at most libraries.

Science

- Aug. 8, 1975 Cenozoic Tectonics of Asia: Effects of a Continental Collision - P. Molnar & P Tappanier pg. 419
Sept. 12, 1975 Minerals and Plate Tectonics (II) Seawater and Ore Formation Research News pg. 368
Oct. 10, 1975 Manned Submersible Observations in the FAMOUS Area: MidAtlantic Ridge R. D. Ballard et al pg 103 Transform Fault and Rift Valley ARCANA pg. 108
Sept. 5, 1975 The Deterioration of Mountain Environments E.P. Sckholm pg. 764 Mechanistic Interpretation of Rift Valley Formation H. Kaide & S. Bhalta Charji pg. 791

con't

INTERESTING MAGAZINE ARTICLES con't

Science con't

- Oct. 17, 1975 Precambrian Paleomagnetism: Magnetizations Reset by Grenville Orogeny
 M. O. McWilliams & D. J. Dunlop pg. 269
- Oct. 24, 1975 Geothermal Resources: A New Look Research News pg. 370

Scientific American

- Sept. 1975 The Earth by Raymond Siever pg. 82
- Nov. 1975 The Subduction of the Lithosphere by M. Nafi Taksoz pg. 88

American Scientist

- Sept.-Oct. 1975 Geothermal Systems and Power Development A. J. Ellis pg. 510

New Scientist

- July 24, 1975 New Data on The Most Recent Magnetic Reversal A summary pg. 199

BOOK REVIEWS by Barbara Lundgren

Geology and Scenery: Rainy Lake and East to Lake Superior

Geology and Scenery: North Shore of Lake Superior

Published by Ontario Dept. of Mines; Toronto, Ontario, Canada (\$2.00 each)



These are two excellent guides to the above mentioned areas. Each book is divided into three sections. The first section in each volume contains an accurate concise description of the bedrock geology of the area, complete with maps and charts for easier understanding, from the precambrian era to the coming of the glaciers. This is also useful for anyone travelling in N. E. Minnesota. The second section is entitled "Points of Interest" and it takes one on proposed motor trips through the areas, telling of points of interest, geologic formations to observe and study, camping areas and of spots to collect mineral specimens. This section in each book is especially good. The third sections contain a description of minerals and rocks of Ontario and where the best places are to obtain them, lists of lapidary clubs and shops, and a glossary of terms and references. Any member of the society planning a trip in the area would find these useful.

A GUIDE TO THE NATIONAL PARKS - THEIR LANDSCAPE AND GEOLOGY

William H. Matthews III

Doubleday Natural History Press (soft cover \$3.95)

The author, W. H. Matthews III is professor of geology at Lamar University in Baumont, Texas and past Director of Education for the American Geological Institute in Washington D.C. and has served as Visiting Scientist for the Texas Academy of Science. In 1965 he was awarded the Neil Miner Award of the National Association of Geologic Teachers for "exceptional contributions to the stimulation of interest in Earth Sciences." He is author of numerous publications and books including Geology Made Simple.

This is an extremely good, short, concise, accurate guide to the National Park system. It is arranged in alphabetical form telling simply the geologic story of the National Parks. It describes the geologic phenomena that has produced the natural features for which each park is noted. It also discusses the scenery, climate, wildlife, and history of each area. The introduction is general geologic information, rock descriptions and processes, geologic time involved, short description of fossil evidence and major points of geologic interest. The author then discusses each path in alphabetical order including information of activities available generally maps, programs, services, rules, facilities and where to write for further information. It is a useful guidebook and study of it will lead to an increased appreciation of the parks from both a geologic and aesthetic point of view.

FUN IN THE FALL IS A FIELD TRIP AT NORTHWOODS

by Marcia Gunville

The warmth and charm of the Northwoods Audubon Center...better than ideal Indian summer weather....fine hospitality and congenial companions....telescopic views of Jupiter and the moon....a muscle-stretching hike up and down leaf covered terrain...the "prize" at the end worthy of all the effort....a well presented geologic story centered around the many ways water has affected Pine County land-forms....all these and more were given G.S.M. field trippers October 18-19 on their last outing of the season. Mike and Jane Link extended themselves to offer us a learning experience which combined the wide-ranging expert teaching knowledge of a professional naturalist with the pleasantness of delicious home-cooked meals. They made us most welcome, and we appreciated their work in our behalf.

Pine County geology focusing on the theme of water naturally will concentrate on the recent period of glaciation, and we saw much field evidence for the presence of glacial ice. But Mike Link's story of water went back much further in time, to the Fond du Lac and Hinckley formations laid down in Precambrian seas. We visited the old quarry in Sandstone's Robinson Park where we had a close look at the Hinckley sandstone, a quartz-rich deposit reworked from the Fond du Lac formation below it. Well formed ripple marks indicate that shallow water existed here when this sand was deposited, perhaps in a lacustrine environment. The clay-sized and gravel-sized particles found in the older formation are gone. The Hinckley sandstone contains only uniform sized grains of the Fond du Lac's sand, making the beautiful building stone quarried here so extensively.

The more recent period of continental glaciation has given the landscape its identifying character. The features we take for granted, the knobby hills and valleys, the lakes, the bouldery till, the sandy prairie, the farmer's crop land all fit together like a jig saw puzzle into a picture illustrating the movement of glacial ice. We saw how the Nickerson and Thomson moraines come together in a V shape, first along the east-west line marking the Carlton and Pine County boundary, and then turning back northeastward toward Lake Superior, built in this fashion by the last (Nickerson) phase of Superior lobe activity. Outwash plains formed in front of these moraines, over which huge ice blocks were transported and subsequently buried. Now, long after the melting away of these buried ice blocks, pitted outwash remains containing many ponds and lakes such as Sturgeon and Sand Lakes.

Behind the Nickerson-Thomson moraine proglacial Lake Nemadji formed, overflowing across the low barrier we saw toward the southwest. We traveled over the Nickerson moraine to look at the clay deposits left by Lake Nemadji, and we saw the Nemadji River flowing north through this area. We had crossed a continental divide, as did the waters of Lake Nemadji when seeking their outlet.

We learned to distinguish the kinds of materials left by glaciers on the outwash plains by the types of plant life growing there. If sand had been deposited we found prairie types of vegetation and large trees of Jack pine and red pine. Some former lakes and ponds, by now converted into bogs, grow spruce and tamarack. Beyond the area of pitted outwash the prairie bluestem, turkey foot, Jack pine and red pine predominate on the sandy outwash soils.

We followed over part of the course of the very long tunnel valley which includes the Northwoods Audubon Center's Grindstone Lake. This tunnel valley was formed under glacial ice during the Superior lobe's earlier St. Croix phase. It represents the course of a large river flowing rapidly under hydrostatic pressure at the bottom of the ice sheet. It can be traced all the way from near Moose Lake southward to the

Anoka sand plain, and then over the Anoka sand plain by a string of lakes to just north of St. Paul. We saw a number of eskers near Finlayson which are situated in this tunnel valley. These winding ridges of sand and gravel deposits were formed when the river under the ice slowed down. As the ice sheet became thinner through melting the hydrostatic pressure exerted on this river was reduced, causing it to disintegrate into a series of braided streams. The water in them was unable to carry off the sands and gravels supplied to them. These sands and gravels still remain collected in the elongated, hilly land features we see today, markers of former streams within an ice mass long since melted away.

We had a chance to observe some of the spectacular effects produced by actively running water when it cuts through sandstone. During postglacial times, while streams still were carrying large volumes of meltwater, their valleys could become deep. Today relatively small, or even dry creeks are found in these large valleys. Near Banning State Park we hiked down the bed of such a dry creek, sliding over the "falls" and examining from the water's vantage point the effects of cutting action on cliff walls. The banks of this creek were very steep. We were impressed by this as we hiked up and down them several times on our way to see the stream-carved arches adjacent to Banning State Park.

The sandstone arches on the banks of Wolf Creek indeed were spectacular. We slid down to the creek through the tunnel of one formation as though riding on a covered playground slide. The largest arch stood high on the side of the valley, well above the present water level. Inside it was big enough to accommodate several people at once. The creek flowed high up at the level of this arch at the time of its carving. We also saw in the rock walls places where tiny indentations had occurred, suggestions of the beginning of more arch formations. The beautiful hike back through the woods, lunch at the state park, and a short hike to see the area of rapids on the Kettle River where pot holes are forming filled out our day and Mike Link's story of water.

Certain memories make this Northwoods Audubon weekend special. High on this list must come Mike's evening program on astronomy. The skies were clear enough for us all to have good telescopic views of Jupiter and the moon, though we kept Mike very busy recentering his instruments on the stellar objects. Climbing up the forest service fire tower at Nickerson was another, where we had a fine view of the Nickerson moraine and the outwash plain beyond it. Not one of us who followed Mike through the woods at Robinson Park will forget the hand carved tombstone of Lora, still here since pioneer days, now hiding upside down from all but those who know where to find it. The collecting of Lake Nemadji clay for modeling, waving at the large group of U of M Duluth Campus geology students caravanning home from Finlayson eskers, the opportunity to see the tamaracks in golden fall color, all contributed to a delightful experience.

One memory we recall with particular pleasure is of Jane Link's fine cooking. Somehow she knew we would need a good breakfast on Sunday, and she served us sausages, juice and beverages, and a recipe new to most of us. We persuaded her to share it with us.

NORTHWOODS BREAKFAST CAKE

Mix together: 2 C Bisquick
1 egg
2 Tb. sugar
2/3 C milk
Fold in: 1 can fruit cocktail, *drained*
Grease 8 or 9" pie pan, pour in mixture.
Bake at 400° for 20-25 min. Serve with hot syrup.
Makes 8 - 9 servings.