



NEWS

Geological Society of Minnesota

FIRST CLASS

MINNEAPOLIS, MINNESOTA



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

RETURN REQUESTED

July-August-September, 1973

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GEOLOGIC PLAQUE #20 AT LAKE MINNEWASKA

Remarks spoken by Dr. Charlie Matsch on the July 14-15 G.S.M. field trip as the bus approached the lookout point of Lake Minnewaska near Glenwood:

(This area). "is marked by the Minnesota Geological Society's plaque, and a very nice one. I thought many of you would like to see some of your sponsored work out here. I want to tell you, too, that in 1965, among many field trips that I have led through here, I always make this a stop because it is a very informative one--a very informative plaque--a beautiful scenic view--and in 1965 we were the host of an international group of people who were here in conjunction with the International Quaternary Congress in Boulder, Colorado. Among those were eleven Soviet scientists, several from Japan, Germany, Austria, and a variety of people. Many of them remarked about the thoughtfulness of marking areas such as this. In their countries this is not heard of."

GLENWOOD REGION

Lake Minnewaska, the chief scenic attraction in the Glenwood area, has, together with the surrounding hills, an interesting geological history. This part of the state - the Lake Park region - is covered by an unusually thick mantle of glacial drift with a maximum thickness of 500 feet in the Leaf Hills. On a thick deposit of that drift, at the northeast

end of the lake, in an observation area with a magnificent view over the entire basin, the Highway Department has installed the Glenwood tablet.

Plaque Inscription

The view from this point reveals the effects of major glaciation in its most vigorous form. Some 10,000 years ago, the last glacier, as it receded slowly to the north and west, paused here long enough to deposit, in characteristic fashion, 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 is 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 carried toward the northeast by meltwater from the main ice field. As a consequence, this portion of the basin had a steep ice-contact slope, formed while the ice block supported the loose material.

Lake Minnewaska, lying 200 feet below this elevation, is a typical example of a lake in an ice block basin.

SEPTEMBER FIELD TRIP WILL BE TO NORTH SHORE AND GUNFLINT TRAIL

The final field trip of the summer has been scheduled for September 22-23 and will deal with the Precambrian geology of the North Shore and the Gunflint Trail. Dr. Charlie Matsch, from the University of Minnesota Duluth Branch, will again serve as trip leader.

Those who attended Dr. Matsch's field trip in July know that he is an outstanding leader. His fine teaching and skill at handling a group, plus the exciting lessons of a challenging geological area, promise to make this another memorable experience.

Arrangements have been made for a chartered bus from the Twin Cities, and group overnight accommodations. Timed to coincide with the color change in Northern Minnesota, this should be an outstanding fall weekend. Costs per person will be approximately \$12-\$15 for bus transportation, nominal rates for lodging and meals, plus a small amount for the leader's fees and miscellaneous expenses. Picnic lunches for both Saturday and Sunday will be brought from home.

Registration should be made now by sending a \$10 deposit to Bob Gunville, 1110 Gardena Ave., Minneapolis 55432. Please make checks payable to the Geological Society of Minnesota. Registration will not be complete without payment of the deposit, and will close when capacity of the bus is reached at 39 passengers. Those on the list will be contacted with further information.

welcome

NEW MEMBERS:

We would like to extend a warm welcome to the following new members:

Mr. and Mrs. Arthur F. Strobel (Alice)
2801 Nevada Ave. S.
St. Louis Park, Minn. 55426

Mr. Chris Schuberth
American Museum of Natural History
C.P.W. at 79th St.
New York, N.Y. 10024

Marian Bodey
6499 Barrie Road
Edina, Minn. 55435

Richard T. Curtin
3521 15th Ave. S.
Minneapolis, Minn. 55407

ADDRESS CHANGES HAVE BEEN MADE

Several members of the G.S.M. have moved recently. The following people have new addresses:

David H. Erikson
6040 W. Broadway, Apt. 23
Minneapolis, Minn. 55428

George J. Petrasch, Sr.
Sheridan Terrace, Apt. 402
4271 Sheridan Ave. S.
Minneapolis, Minn. 55410

Mrs. Marjorie McGladrey
4200 Park Ave.
Building 8, Apt. 17
Des. Moines, Iowa 50321

Elsie J. Saeia
314 Hennepin Ave., Apt. 1519
Minneapolis, Minn. 55401

Mr. and Mrs. David Sims
2149 Goodrich
St. Paul, Minn. 55105

DUES FOR 1974 ARE PAYABLE NOW

The Membership Committee would like to receive checks for 1974 dues early in September, preferably by Sept. 10, so that membership cards can be prepared and given out at the Annual Meeting on Sept. 24 at the Viking Village. This would greatly help the Committee's work.

Individual - \$7.00
Husband and Wife - \$10.00
Student - \$2.00

Please make checks payable to the Geological Society of Minnesota and mail them to Mrs. Pearl Downey, 1855 Sargent Ave., St. Paul 55105.

THE PLIISTOCENE -- A FIELD TRIP OVERVIEW

by Marcia Gunville

The power of ice, in glacial masses, was brought to some understanding by Dr. Charlie Matsch on the July 14-15 field trip. Those of us who came with him to southwestern Minnesota and western South Dakota were shown how to go back in time and visualize the onslaught of these great ice sheets upon the landscape before us.

We learned to see from the evidence the paths these continental glaciers took, and how they plucked and scoured the soils and bedrock in their way, distributing this debris in long trails for hundreds of miles. We saw the places where they piled up huge moraines, unable to advance their debris materials further. And we saw some of the results of stagnant and retreating ice which has so markedly affected the present topography. Evidence of ancient rivers is there. Evidence of lakes and forests which existed between glacial episodes is also there. And the readvance of one glacial mass after another is clearly evident.

We followed the wide valley of the glacial River Warren, which once drained glacial Lake Agassiz. The width between the old banks all along its channel gave some idea of the tremendous amount of water this river carried. Today only the relatively tiny Minnesota River remains. Huge, massive boulders left in River Warren's course showed us how great was this stream's speed and power. We could see its terraces and flood plains, and some of the islands which had lain in its path. A stop was made to see how it uncovered some of the oldest bedrock in North America in the Morton-Granite Falls area. This valley is now rich, gentle farmland, its origins unknown to most of the people who travel there. We passed by a motel where, according to Dr. Matsch, the geologists working in the field "now sleep in the bed of the River Warren."

"And that's no water bed!" commented one member of our group.

We learned to recognize from the different glacial tills how the ice advanced a number of times over an area, the nature of each till being indicative of the glaciers' pathways. The Hawk Creek Till is the eldest that we identified. It was pink to reddish-brown in color and contained stones of the basalts, granites, felsites and agates typical of the Lake Superior area. This very early Superior lobe had extended past here.

On top of the Hawk Creek Till is another yellow to yellow-brown calcareous till with stones of carbonates and granites. Called the Granite Falls till, it has no shale content, which is common in the next till above it. It is similar to the till of the Madena lobe, evidence that the Madena lobe did not stop at the Alexandria moraine as had been thought, but extended at least 130 miles south of its formerly proposed limits.

The last advance of ice, the Des Moines lobe, brought in the New Ulm till. This till is light olive-brown to gray in color, and contains not only calcareous and granitic stones, but abundant shale. This ice sheet had come from the west over the Pierre Shale formation of southern Manitoba and the eastern Dakotas. All three of these Wisconsin Age tills could be clearly determined, and at some stops we could find them all, one on top of another.

At some places we found a curious feature called a boulder pavement. It was a line of large, striated and faceted stones set down in pavement-like fashion of one-boulder thickness. Dr. Matsch told us that this pavement is not an uncommon glacial feature, and that this one, wherever it appears, serves as a marker between the Granite Falls and the New Ulm tills. We had fun trying to puzzle out the origin of the boulder pavement. Could it have been deposited by a concentration of big rocks on the surface of the older moraine, abandoned there by erosional forces, too heavy to be moved?

Stagnant and melting ice created many of today's landscape forms. Picture this rotting ice sheet as a dirty, debris-filled mass with many holes and cracks on its surface, and caverns, tunnels and rivers in its interior. Mud and dirt slip and flow into the holes and cracks, the tunnels and rivers fill with a bedload of sediments. Sometimes ice chunks will become buried in masses of muddy debris. When the ice finally is completely melted away, all of these turn into bumpy landscape features of hills and depressions, forming lakes and kettles, kames, eskers, ridges and doughnuts, a peculiar form created by a complex mechanism of ice disintegration and mud flows.

We traveled to Brown's Valley and saw where Lake Agassiz made its southern outlet into the River Warren. The remains of the old drainage channels are still present. We went out onto the flat-lying bed of Lake Agassiz itself, and could look back at the curving shore-line of the Tintah beach. Higher in elevation stood the Herman Beach, and two more beach

(continued next page)

Annual Meeting COMING

The G.S.M.'s annual Meeting will be held Monday, September 24 at the Viking Village, 27th Ave. S. and Lake St., Minneapolis. Beginning at 6:30 p.m. members should go through the regular Smorgasbord and eat in the special dining room reserved for them. The meeting will begin after dinner at 7:30. The program again will include a review of the past summer's field trips and a preview of the coming lecture series.

Elections to the Board of Directors will be on the agenda of the business meeting. The Nominating Committee is submitting the following list of candidates:

Fred Bradford
Irene Carlson
Robert Gunville
John Podolinsky

Further nominations may be made from the floor.

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On October 13-14, the Anoka County Gem and Mineral Club will hold its ninth annual show at Apache Plaza. Hours on Saturday are from 9:30 a.m. to 5:30 p.m. and on Sunday from 12:00 noon to 5:00 p.m. Admission is free.

NEW MINN. GEOLOGICAL SURVEY HEAD MEETS G.S.M. MEMBERS

Dr. Matt Walton, the new Director of the Minnesota Geological Survey, had an opportunity to get acquainted with G.S.M. members who attended the August 14-15 field trip to the Minnesota River Valley led by Dr. James Grant. Dr. Walton is an expert on Precambrian geology, and decided to avail himself of this opportunity to see first hand some of Minnesota's ancient bedrock gneisses. He came along as a regular tour member, but he added a bonus to Dr. Grant's excellent leadership with his own background and teaching comments.

Dr. Walton brings to the Minnesota Geological Survey a wide variety of knowledge and experience. He comes from Denver, Colorado where he was a consulting geologist and environmental scientist with the Virolyne Corporation. He has been a regent's lecturer and Project Consultant at U.C.L.A., a consultant for the American Society of Civil Engineers, a geologist at the U.S. Geological Survey and at the New York State Geological Survey, an Associate Editor of the American Journal of Science, and on the faculty at Yale University.

Members of the field trip enjoyed very much having Dr. Walton along, and appreciated the many helpful contributions he gave them.

(Field Trip -- continued)

lines lay below us. All four beaches represent levels at which the lake became stabilized for long periods of time. On a rise in the lake bed we were able to find sorted gravels and cross bedding, evidence of this grassland's former history.

In eastern South Dakota, close to the Minnesota border, lies the Coteau des Prairie, an area of high bedrock relief. Driving onto the Coteau, we could appreciate why the Des Moines lobe to the east and the James lobe to the west could not surmount this land barrier, and formed great moraines flanking both sides. The Denis moraine is the terminal moraine of the Des Moines lobe. To the east lay the Altamont moraine, a belt of hummocky topography associated with the Des Moines lobe's stagnating ice.

Much farther east we later traveled into the Alexandria moraine, the huge complex which extends to the Twin Cities. Near Glenwood we drove over "Super Laker", affectionately named by Dr. Natsch because of its size, and to Lake Innewaska. (See Newsletter inside cover.)

It was with a feeling of awe for the immense amount of work done by these glaciers that we returned to the Twin Cities, the weekend not only being a very exciting learning experience, but relaxing and fun as well. Dr. Natsch helped us to look upon our state's beautiful scenery with a better educated eye.

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GEOLOGICAL SAFARI IN EAST AFRICA

We (Mary Kimball, Pat and Sallie Lewis) experienced an intense exposure to the pre-Cambrian shield gneisses and schists by bouncing over them in a Volkswagen bus. The central area of Kenya and Tanzania that we traversed is essentially an uplifted (5 to 6,000 ft.) plateau with a major rift valley along and into which vast quantities of Miocene to recent lavas flowed. Also, along the major rift escarpment, mighty cinder cones formed majestic glaciated peaks such as Mt. Kenya and Mt. Kilimanjaro. Imagine large glaciers still existing at the Equator! The tremendous gap in rock ages was certainly striking - the basement rocks are about 3 billion years old and then the volcanics at only 25,000,000. As one would expect, volcanic ash is very prominent and on the unpaved "roads", which most are, the clouds of dust from our buses permeated everything. Fortunately the climate is mild and the temperature usually around seventy.

There was an attempt to emphasize mineralogy which led to major stops at Lake Magadi, which is the major Trona deposit in the world, the Tanzanite mine, a ruby mine, a beautiful blue calcite claim, Kyanite, and an exquisite amazonite pegmatite quarry.

All of the tourist accommodations were outstanding, even by our American standards. At Lake Manyara the hotel was built on the edge of the western rift wall with a broad view of the 2,000 ft. drop to the lake and valley below. At Ngorongoro, again the hotel was built on the inner rim of the crater. Much of our travels were across flatlands that included a number of wild game preserves, such as Amboselli, Serengetti, Ngorongoro, Masai Mera and Treetops. Elephants, rhino, lion, leopard, giraffe, zebra (Mary's most photographed animal) eland, hartebeest, wildebeest, waterbuck, impala and dik dik were seen in abundance. This area included largely Masai tribal land. The Masai are a beautiful, proud people of apparent Egyptian heritage, living close to the land in their little round, dung-covered huts. Men and boys spend their days herding their status donkey and Brahma cattle about the parched grasslands. Their main token of modern life was steel spears and extensive beadwork. One could, in a much more intimate way, see the inseparable bond between man and his environment.

Studies of early Man were not neglected, and certainly a personal lecture by Mrs. Leakey at Olduvai, where "Zinjanthropus" was found in the 300 ft. thick sequence of Plio-pleistocene lake beds, was a high point of the trip. We also went to Ologesallie National Park where early man's tools have been found and left in place, undisturbed. The trip was well led by a geologist, Chris J. Schuberth, employed by the American Museum of National History, NYC, as well as a local, vivacious Polish girl (Kas') who handled all transportation and accommodations. Meals were excellent, many courses, and beef was plentiful.

We expect to have our slides, crafts, and specimens together to share with the Society at the Spring lecture.