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NO. 2

Progress is always the product of fresh thinking,
and much of it thinking which to practical men bears the
semblance of dreaming.

Robert Gordon Sproul.

GEOLOGICAL SOCIETY OF MINNESOTA

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MEETINGS: October to May inclusive, 7:30 P.M. every 1st and 3rd Monday not a holiday, at Ford Hall, University of Minnesota, 17th Ave. S.E. and Washington Avenue. Visitors welcome.

FIELD TRIPS: May until October inclusive.

ANNUAL DUES: Residents in a 50 mile radius of the Twin Cities \$ 3.00 plus \$ 1.00 additional for husband, wife, or dependent family members. For students and non-residents, \$ 1.00.

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and

THE AMERICAN FEDERATION OF MINERALOGICAL SOCIETIES, Inc.

* Deceased

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PLAQUES: The current stage of the Geological Marker Project, which was financed by the Louis W. and Maud Hill Family Foundation is nearing completion. The tablets made for Itasca and Whitewater State Parks as well as the Mesabi tablet for Hibbing will be installed in 1957. In spite of the delay in making a full report, an accounting will be made to the Foundation on the accomplishment to date. It will be comprehensive and include a description of all of the locations and tablets, whether financed by the Foundation or not, as well as the mural in the River Room of Schuneman's store in St. Paul. Only in this way can the directors of the Foundation appreciate the scope of the enterprise and the degree of success up to this time. At present the treasurer has sufficient money to purchase four more tablets which will be done as soon as locations are selected and texts prepared. Mr. McWethy is working on one for Jay Cooke State Park but other locations have not been chosen. Your help is needed.

THE FIELD TRIP PROGRAM for 1957 is now in the making. Several two day trips have been suggested to the Directors but the most pressing need for a well rounded schedule is suggestions for one day trips and volunteers who will act as leaders. Please consider that this is your responsibility both for the plans as well as the execution of the program. Any member of the Board of Directors will be glad to accept your offer to help.

ATTENTION PLEASE: There are a number of members who either by oversight or neglect have not paid their dues for 1957. We know it is either oversight or neglect because some of them are members of many years standing. There are others who dropped out of the Society either in 1955 or 1956 who we are quite sure would like to come back in. We suggest anyone who is in doubt as to whether or not they are up to date with their dues call either Mr. Rickmire (TA 2-0931) or the editors (WE 9-6953) and check with them. Dues may be sent by mail to Mr. Rickmire, 5826 Pillsbury Avenue or paid in person at any meeting at Ford Hall.

BULLETIN BOARD

Mr. John W. Webb is nearing completion of his series of lectures on the geology and geography of western Europe. They have been received with a most favorable response by his listeners and you are urged to attend the rest of the series. The schedule is as follows:

- Feb. 18 - Paris and the Paris Basin.
- Mar. 4 - Agriculture & Industry in Great Britain.
- Mar. 18 - The Rhineland.
- Apr. 1 - Europe as a Unity.
- Apr. 22 - Annual banquet at which Dr. John R. Borchert will talk on the general subject of water resources and water problems of the United States.

ABOUT FIELD TRIPS.

by
Dr. Bert Carlson.

Field trips are a part of the program offered by the Geological Society of Minnesota. The real purpose of the field trip is to make the lecture material of the winter months more tangible and better understood. In addition to its educational value it gives an opportunity for a pleasant outing with interesting company.

To continue our field trip program we must have a continuous supply of field trip leaders. To serve as a field trip leader, does not mean that one should conduct any and every field trip and have information on everything encountered; it means that an individual need be prepared for but one trip and, except for the material outlined below, he need not be an authority on geology.

To plan and carry out a field trip, the first requirement is the selection of an area to study. Selection is made by some knowledge of an area obtained at a previous visit, mentions of interesting features in newspapers or magazine articles, or a story of a visit by some friend. When an area has been selected, material on the geology, geography, history, etc. is gathered and studied. By means of maps, stops are selected and a rough itinerary with mileage plotted against time is made. After having gathered as much pertinent material as possible and having evolved a rough outline of the trip, the next part in the process is scouting. A little more time is needed for scouting than will be used for the actual trip, so for a Sunday trip a weekend may be needed and for a longer trip perhaps two weekends.

With the information at hand all the main and secondary roads in the area are explored as well as areas that can be reached only on foot. During this process the best stops are selected and best access roads made note of with the time and mileage. During the scouting a rough idea is made of the final route and places for rest stops, noon lunch, or overnight lodging investigated. Much planning can also be done by correspondence, by mail with acquaintances or executives of societies and places of business in the trip area.

The following is an outline of the plans for a field trip that was conducted by the Society in 1956. A field trip notice is also prepared by the leader giving the purpose of the trip, name of leader, type of transportation, date and other information.

First an itinerary with towns, highway routes, and mileage is made as follows:

ITINERARY

Minneapolis		Garretson	5
St. Paul	8 miles	Stop at Devils Gulch	
U. S. 169		1/2 mile north of town.	
St. Peter	79	3 miles south of town	
State 99		turn left at sign to	
To U. S. 14		Palisades State Park	
New Ulm	17 119	Carson	10
Stop at Red Rock Quarry		To U. S. 16	
east of New Ulm.		Valley Springs	8
Rest stop in town.		Beaver Creek	6
U. S. 14		Luverne	8 285
Sleepy Eye	14	Overnight stop at	
Springfield	11	Hotel Manitou	
Noon lunch in park		U. S. 75	
To U. S. 71	8	6 miles north of Luverne	
Tracy		turn right to Mound State	
to U. S. 59	32	Park	
Florence	15	Hardwick	
State 23		Trosky	
Ruthton		Pipestone	25
Holland		Turn left 1 mile north of	
Pipestone	23 223	town to Pipestone Monument	
State 23		Noon lunch in Park	
Ihlen	7	Florence State 23	23
Jasper	8	U. S. 14	
Turn thru town to		Tracy	22
see quartzite buildings		Springfield	23
State 269		Sleepy Eye	11
So. Dak. State 11		Rest stop	
Sherman	10	New Ulm	14
		St. Paul	119 527

On this trip a list of elevations was included to give a better understanding of the country.

Nicollet 960	Holland 1775	Hardwick 1620
Courtland 940	Pipestone 1693	Adrian 1538
New Ulm 837	Ihlen 1660	Worthington 1582
Sleepy Eye 1034	Jasper 1650	Summit 1588
Lamberton 1144	State line 1500	Heron Lake 1417
Walnut Grove 1223	Valley Springs 1383	Windom 1353
Tracy 1403	Beaver Creek 1443	Mountain Lake 1300
Balaton 1528	Luverne 1451	St. Killen 1700
Ruthton 1825	Mounds State Park 1575	Comfrey 1225

Sioux Quartzite outcrops;
Near Comfrey along Little Cottonwood River
Mound Park and Rock river
Pipestone
Garretson So. Dak on Split Rock Creek

An outline of tentative trips has been prepared for next summer. Those who have promised to act as trip leaders would like a partner to work with and join in the preparation of material.

PLAN NOW FOR THE LONG FIELD TRIP

JUNE 15 TO 30, 1957.

Plans are progressing on the 1957 field trip to south-central Colorado and northern New Mexico to be conducted between June 15th and 30th, 1957. Past president Hal McWethy will lead the trip, with Chas. Havill as registrar and comptroller. Under present plans we expect to begin sight-seeing and geology at Colorado Springs (Garden of the Gods), then Cripple Creek, Canon City, Royal Gorge, Salida, Colorado Sand Dunes Monument, Taos (New Mexico), Ghost Ranch, Bandelier National Monument, Santa Fe, Albuquerque, Grants (uranium) Ship Rock, Mesa Verde Colo., Durango, Ouray (million dollar highway), Gunnison Canyon, Leadville, Central City, Red Rock Natural Theatre, University of Colorado at Boulder and Denver. *Montrose*

Mr. & Mrs. McWethy are rather familiar with most of the proposed routes but expect to leave here early in April to scout the trip. In Denver they plan on a day with consulting geologist Daniel S. Turner who is in a position to secure entrance to various mines and who may spend some time with us.

The trip mileage will approximate 3,200 as compared with 3,800 on last years trip. The bus cost per passenger with a 41 passenger air-conditioned bus will be about \$ 46.00. Motels and hotels will probably average \$ 45.00. Add \$ 9.00 to cover miscellaneous transportation cost (Pikes Peak, etc.) brings the total for transportation and lodging to \$ 100.00.

If we are willing to economize on lunches and save travel time by carrying thermos bottles and having our lunches put up at breakfast time our total cost for food can be kept within \$ 50.00. Thus the trip cost if all will cooperate will total under \$ 150.00.

No other means of transport can offer at such an economical rate the fellowship, the fun, the grandeur of the upthrusting Rockies, the sand dunes, the insight into Colorado mining operations and such contacts with the Pueblo Indian habitations - past and present.

The above data were outlined to our members at the last meeting of our Society in Ford Hall. 22 persons immediately signed up and 8 wanted to go but were not sure of their arrangements - a total of 30 prospects at this one meeting. If you are interested and would like to go please make your reservations now with Mr. C. H. Havill, 5450 Bryant Avenue North, Minneapolis, telephone JU 8-7136. Tell him whether you are willing to team up four in a room, two in a room or desire a single room. Let's get our plans made now so that we can have some selection of motels at our overnight stops.

Come to the next meeting of the Society at Ford Hall and learn more about it. Your questions by letter or in person will be welcomed.

MR. McWETHY WOULD LIKE ALL PERSONS WHO ARE GOING OR THINKING OF GOING ON THE LONG FIELD TRIP THIS SUMMER TO ATTEND A MEETING AT 7:00 P.M. ON FEBRUARY 18th AT FORD HALL. THIS WILL BE JUST PREVIOUS TO THE REGULAR LECTURE MEETING.

TREASURER'S REPORT

RECEIPTS:

From dues,		
78 memberships at \$ 3.00		
84 memberships at \$ 4.00		
11 memberships at \$ 1.00		
1 membership at \$ 1.50	\$ 230.50
From field trips:		
May & June 1956	\$ 7.20	
Taylors Falls	4.95	
From Havill, Baraboo	65.57 net	
From Havill, Hankato	19.67	
From Dr. Carlson, Pipestone	21.00	
From King	<u>7.15</u>	\$ 105.54
From Nordberg, exhibit at Fair		<u>50.00</u>
		Total receipts \$ 486.04

PAID OUT:

Univ. of Minn. film operator	\$ 7.50	
Crook & Hanley, supplies	19.45	
To Loretta Koppen, postage	7.75	
To Gile Letter Service	10.65	
To Gile Letter Service	2.00	
To Loretta Koppen, postage	6.64	
To Loretta Koppen, postage	10.64	
To Gile Letter Service	9.20	
To Dr. John W. Webb, 10 lectures	<u>125.00</u>	\$ 198.83
		balance \$ 287.21
Savings Bank account, last statement		\$ 500.00
Received from Mr. Preston's will		500.00
Interest on this account to Jan. 31		24.17
Exhibit at Fair		50.00
Transferred from checking to savings		<u>200.00</u>
	Total in savings	\$ 1274.17
Checking account last statement		\$ 94.77
Checking account above		<u>27.21</u>
	Balance checking account	\$ 181.98

Submitted by,

A. P. Rickmire, Treasurer.

1956 FIELD TRIP REVIEW

by
Marian Skahep.

A summer vacation field trip that I took recently with the members of the Geological Society of Minnesota had so many interesting high lights that I thought I would make a written review of it. Dr. Bert Carlson was field trip leader.

The trip was planned with destination Mt. Rainier. A group of 35 members left here on Saturday morning, July 14th by air conditioned, air suspension bus. We traveled through Willmar, Ortonville and Aberdeen and spent the night at Moberg, S. D. a small frontier town which seemed to have quite a large proportion of Indian population. The following day we had breakfast at Lemmon, S. D. where we visited the World's only Petrified Wood Park located on Main St. in the heart of the city. The museum on the grounds is built entirely of petrified wood. They had on exhibition 3200 tons of petrified wood, 100 large cone shaped pyramids and 400 fossil monuments. It was a unique and colorful exhibit. Then on through Baker, Miles City and Billings, Montana, where we stayed at the Westward Ho Hotel.

On Monday morning we went through Livingston to Three Forks Junction where the three principal headwater streams, the Jefferson, Madison and Gallatin Rivers converge to form the mighty Missouri River, which they say is the largest river in the United States. I thought it was the Mississippi.

Then on to historic Virginia City, once a typical gold camp in Montana territory in 1863 when pay dirt was found in Alder Gulch. It seethed with crime and the road agent population was cut down by "necktie parties". We saw the room in a small building where these hangings took place as well as some of the graves with their unusual descriptions of the victims. After placer mining subsided the old camp declined until its recent restoration was started in 1946 by Charles Bovey of Minneapolis. The city is being rebuilt just as it was in the old days, and is called the "Williamsburg of the West". We had a ride in a surrey drawn by six horses over steep hills of the town where on the turns we thought we would fall out.

Our next stop was Butte, Montana. This is typically a mining town nearly surrounded by the mountains from which it takes its name and which are the source of the copper bearing rock that is being extracted from the mines by gravity. We visited the Kelley mine under the guidance of John N. Dunstan, an engineer who has been with the mining company for 37 years. We donned miner's uniforms, helmets and lights, and were taken down to the 600 and 700 foot levels of the mine to learn something of the procedures used in removing the ore bearing rock. Open pit mining is also being done in Butte. Between 4,000 and 5,000 people are employed in the mining operations. We also visited the Montana School of Mines, and there saw one of the finest collections of precious and semi-precious stones and fossils that I have ever seen. The largest building in Butte is a hospital.

From Butte we went to Anaconda to visit the smelting plant of the Anaconda Copper Company. Words fail to express our amazement at the immensity and complexity of these operations. We followed the operations from the time the rock laden cars came in at one end of the building through the rod and mill crushing process, after which the material was pulverized and separated in huge vats where various by-products were removed; finally the copper was melted and

mechanically poured into a large circle of moulds, cooled and stacked for shipment. The smelting plant is many blocks long and has the largest stack in the world which is 585 feet high and weighs 23,810 tons. This high stack is necessary to carry off the poisonous vapors without injury to people and vegetation.

From Anacondas we proceeded through Missoula, Montana, Wallace, Idaho, to Cour d'Alene. While there we visited the lumber mill of the Northwest Lumber Company, where we saw the big logs pulled in from the river at one end and followed the processing through the finished lumber coming from the drying kilns. The Templin Cafe across the street from the Desert Hotel where we stayed was a very find place for meals; also the Shady Rest Hotel on Lake Cour d'Alene was an exceptionally fine place for lunch. I mention these because really good eating places were few and far apart. While at Cour d'Alene some of us took an early boat ride on beautiful Cour d'Alene right in the center of the city.

From Cour d'Alene we went through Spokane, and for miles in approaching it we saw the unproductive scab lands. In Spokane we stocked up on fresh fruit of the season, and then proceeded to Grand Coulee Dam where we stayed at the Grand Coulee Dam Hotel. It was so close to the dam that the cooling effects of the great waterfall could be felt, and its roar made a soothing sound that lulled us to sleep that night. We had an appointment to meet an engineer at the dam in the morning. He was C. E. Benjamin, one of the three remaining on location out of the 600 engineers who built the dam, so he was familiar with every detail of its construction and operation. He was also a geologist. He came in our bus and we rode for miles over the area which is a part of the Columbia River Basin Project. We made numerous stops and explained the geological strata which is mostly basaltic and granitic rock.

The following is copied verbatim from a pamphlet on the project:

"The Grand Coulee Dam is an area of considerable geologic interest. It is at the northern border of the Columbia lava plateau, which lies between spurs of the Rocky Mountains on the east and the Cascades on the west, and extends several hundred miles southward from the Okanogan Highlands through eastern Washington, eastern Oregon, and southern Idaho, into Nevada and California. The plateau was formed by many successive flows of highly fluid basaltic lava from fissures in the earth's surface, at intervals of hundreds of thousands, and perhaps millions, of years.

During the last ice age, a continental glacier about 300 miles wide and 1,200 miles long covered the mountainous area of western Canada and Alaska, and extended into Washington and northern Idaho. The tremendous summer runoff from the ice cap cut in the northwestern part of the Columbia lava plateau the 1,600 foot canyon in which the Columbia River now flows. Two or more times, southerly advances of the glacier closed the river canyon, and forced water to overflow across the country southwesterly to the canyons of the Snake and Columbia Rivers in southern Washington.

The principal ice-age diversion channel, $1\frac{1}{2}$ to 5 miles wide and several hundred feet deep, is known as the Grand Coulee. It was created in the course of thousands of years by two great waterfalls, one of which originated near the west of Coop Lake and formed the Lower Grand Coulee. The other waterfall was formed at a declivity in the lava plateau about 30 miles from the river canyon, and it cut out the much larger Upper Coulee. Public highways traverse both coulees. Points of scenic interest are the majestic Steamboat Rock in the Upper Coulee, the 417 foot Dry Falls at the head of the Lower Coulee, and a chain of picturesque lakes in the Lower Coulee. In 1951, the 27 mile equalizing reservoir

was formed in the Upper Grand Coulee by pumping water for irrigation into it from the reservoir above the dam.

The dam rests on massive granite, a remnant of the foothills of the Okanogan Highlands, buried in the Columbia lava plateau millions of years ago, and exposed when summer torrents from the Cordilleran ice cap cut out of the lava and underlying granite the 1,600 foot canyon in which the Columbia River now flows. It is a "gravity" dam, depending on its weight alone to prevent the water pressure on its upstream face from tipping it over or causing it to slide on its base.

The site was chosen because a suitable granite foundation was available there, and because it is near the mouth of the Grand Coulee, through which water can be taken to irrigable land with minimum lift from the reservoir.

The Grand Coulee Dam is called the Eighth Wonder of the World, and it is a good description. It took 8 years to build and cost \$186,000,000. It is part of the Columbia River Basin Project which is to cost 750 million dollars and require 40 years to complete. While it is a monument to the skill of engineers and the minds of men who conceived the project, it was all started by nature's floods and erosion powers that excavated the canyon of the Columbia and diverted its channel to sculpture one of the world's wonders, Grand Coulee.

From the Grand Coulee Dam we visited Soap Lake in the area and found the water to have a soft slippery feeling when we used it to wash our hands. Then on to Ellensburg and Yakima where we spent the night at the City Center Motel, a very fine place close to downtown Yakima. We had dinner at Wardell's, which is also one of the finest places for meals to be found on our trip.

Early Sunday morning we took the trip up and around Mt. Rainier for nearly 100 miles to a point with an elevation of 6,100 feet. The mountain is 14,408 feet high and is snow covered now from a point of 4,000 feet, although flowers grow and bloom everywhere on the exposed faces of the mountain. The day was ideal for a trip of this kind, and we found that 16,000 other people went up the mountain the same day. The scenery was spectacularly beautiful.

We returned to Cour d'Alene on Monday via Kennewick and Ritzville. The next morning we visited a wallboard pressing plant where all waste lumber was made into shavings, then combined with some adhesive mixture and pressed into large sheets of wallboard which can be used for cupboards and other interior finishing. The plant was located at Sandpoint, Idaho.

From there we went to Bonners Ferry, through Kalispel and into Appar, Montana where we stayed at the Village Inn. This is a part of Glacier Park. In the morning we walked a long two miles up the steep path to Avalanche Lake where we saw numerous waterfalls coming down from the mountain side. Bears and other wild animals abound in the park. In the afternoon we made the trip out of the Park on the spectacular Going-to-the-Sun Highway which links the east and west sides of the park, crossing the Continental Divide at Logan Pass, (elevation 6,664 feet). The highway is fifty miles long and is spectacularly picturesque. The view at many points is awe inspiring.

From Glacier Park we went to Great Falls, and then to Lewiston and Glendive on our way home. On this part of the trip we had a slight accident near Winnett, Montana. A truck with some equipment projecting at its side struck the rear vision mirror on our bus and shattered it and two panes of glass in the bus. This incident meant a delay of three hours in an open field for a

report to highway officials. It was fortuitous for some of us for when we left the bus we were surprised to find the area covered with Montana agates and other interesting rocks. We made good use of the delay. I added rocks and two Montana cacti to my collections.

At Glendive we stayed at the El Centro Hotel. A friend of Dr. Carlson's and two other men from the Chamber of Commerce escorted us through the Bad Lands Park where wind and water erosion had built castles and spires out of the sandstone in unusual and spectacular formations. Then we went to the city library where we saw a collection of stones, agates and artifacts which had been found in the local area.

It was good to get home. It is no exaggeration to say that fields and trees looked greener in Minnesota than in any other state, stimulated probably by an overabundance of rain. But, east or west - home is best.

Marion Skahan.

GEOLOGICAL SOCIETY OF MINNESOTA

Caro P. Rickmire, Treasurer,
3826 Pillsbury Ave. So.,
Minneapolis 9, Minn.

APPLICATION FOR MEMBERSHIP

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Mr. Hal E. McWethy
2174 Dossell Ave.
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