



THE MINNESOTA GEOLOGIST

OFFICIAL BULLETIN
OF
THE GEOLOGICAL SOCIETY OF MINNESOTA

VOL. XIX

SPRING and SUMMER 1965

No. 1

Sarcastic Science she would like to know,
In her complacent ministry of fear,
How we propose to get away from here
When she has made things so we have to go
Or be wiped out. Will she be asked to show
Us how by rocket we may hope to steer
To some star off there say a half light-year
Through temperature of absolute zero?
Why wait for science to supply the how
When an amateur can tell it now?
The way to go should be the same
As fifty million years ago we came—
If any one remembers how that was;
I have a theory, but it hardly does.

Robert Frost

GEOLOGICAL SOCIETY OF MINNESOTA

Mrs. Marion S. Skahen
500 Ridgewood Avenue,
Minneapolis, Minnesota 55403

Alphage Greenwood 2-2969
Route 3 - Box 130
Grand Minn
55364

Editor

OFFICERS

Clyde Case, President
Fred W. Hallberg, Vice-President
Dr. Bert R. Carlson, Secretary
Charles Havill, Treasurer

Grace V. Benz, Director
Dr. William L. Cavert, Director
J. Orval Engen, Director
Martha M. Peterson, Director
Marion S. Skahen, Director

Elmer H. Koppen, Director

PAST PRESIDENTS

Junior F. Hayden*
Alger R. Syme*
Charles H. Preston*
Joseph W. Zalusky
Dr. Edward H. Mandell

Dr. H. N. Reinking
Hal E. McIethy
J. Merle Harris
Dr. Bert R. Carlson
Lawrence W. King

Elmer L. Koppen
George A. Rickert
Clark Pettengill
William F. Schroeder*

*Deceased

MEETINGS: October to May, inclusive, 7:30 P.M., every second and fourth Monday in Ford Hall, University of Minnesota, 17th and Washington Avenues, S.E. Visitors welcome.

FIELD TRIPS: May until October, inclusive.

ANNUAL DUES: Residents in a 50-mile radius of the Twin Cities, \$5.00, plus \$2.00 additional for husband, wife, or dependent family members. Students and non-residents, \$2.00.

AFFILIATE MEMBERS: Midwest Federation of Mineralogical and Geological Societies

and

The American Federation of Mineralogical Societies

STANDING COMMITTEES--CHAIRMEN:

Constitution and By-Laws
Parliamentarian
Bulletin and Editorial
Program
Field Trips

Membership
Geologic Tablets
Historian

Martha M. Peterson
Grace V. Benz
Marion S. Skahen
Fred W. Hallberg
Elmer H. Brown and
George A. Rickert, Co-Chairmen
Martha M. Peterson
Lawrence W. King
Hal E. McIethy

STANDING COMMITTEES--CHAIRMEN: (cont.)

Library*

Hospitality and Sunshine
Property and Equipment
Auditor
Banquet

Wilma Monserud and
Elsie J. Sacia, Co-Chairmen
Elsie J. Sacia
Dr. Henry N. Reinking
J. Orval Engen
Grace V. Benz and
Martha M. Peterson, Co-Chairmen

*A list of informational books on Geology is included in this bulletin.

HONORARY MEMBERSHIP

An Honorary Membership is awarded to Mr. James Horn, 309 Laura, Green Bay, Wisconsin. Mr. Horn, a former steadfast charter member of our society, is now living in Wisconsin. To keep him in touch with our activities, we will continue to send him our bulletin with our best wishes.

THE 26th ANNUAL BANQUET

The 26th annual banquet of the Geological Society of Minnesota was held on Monday, March 29, 1965, at the Mount Olivet Church Hall, with 80 members and guests attending.

Dr. Arthur Nash, Dean of Science at Augsburg College, who has been Ranger Naturalist at Yellowstone National Park for 26 years, gave a vivid account of the geologic and scenic wonders of the park. He showed pictures of the spectacular geysers and the changes made by the earthquake several years ago which caused great faulting and destroyed roadways.

Pupils of Mr. Nelson and Mr. Jaspersen, Art teachers at Central High School in St. Paul, prepared the attractive free form modernistic sculptures in various colors which decorated the dinner tables. The many favors for guests were solicited by Martha M. Peterson. Chairman of the committee which made arrangements for the banquet was Grace V. Benz, assisted by Martha M. Peterson, Co-Chairman.

CONVENTION

Notice has been received that the 1965 Convention of the Midwest Federation of Mineralogical and Geological Societies will be held at the Roberts Municipal Stadium at Evansville, Indiana, on July 29, 30, 31, and August 1, 1965. The Evansville Lapidary Society will be host.

A MESSAGE FROM YOUR PRESIDENT

It is with sadness that I recall the loss of your last president, Mr. Schroeder. He was the first to invite Mrs. Case and me to take a trip with the group. What a memorable occasion and pleasant association! Possibly you have forgotten—but we haven't—that you gave us the front seat on the bus. His inclusion in our bulletin of the poem by Edwin Markham was typical of Mr. Schroeder; also typical of Mr. Schroeder was his dedication to our society and his unceasing work in our behalf.

In my association with the "Board", I feel that they, too, are devoted and tireless in their efforts. The society may point with pride to past achievements. May we continue to attain new goals. To me the membership at large consists of a friendly group, made up of individuals who, to paraphrase one author, "probe into the mysteries of existence."

There is an enjoyable story about one professor, who, before he started an experiment, would say, "We are about to ask God a question." I feel fortunate in being associated with a group, the individuals of which take time to ask a question, or who take time to help others search for an answer.

The following expression from one of the board, who has aided in our time of need, is well worth your consideration. Kindly give it your thought, and convey your reaction to me or to the board:

The Society is devoted to the study of geology, mineralogy and earth science for their informational and educational value. Members may prepare for the years to come with an interesting and satisfying hobby activity and make the world a more exciting place to live by learning about the wonders of its structure. In this age of scientific marvels by man, life offers a challenge to any one prepared to accept it.

The lecture series of the past season was interesting and varied. If there is any special feature of geology or mineralogy on which members would like information in the coming lecture series, we will be pleased to have them notify us.

The field trips offer an occasion for friendly fellowship and the opportunity to study earth structure at first hand in the search for fossils, rocks and minerals.

It is gratifying to report that our efforts at increasing our membership have been successful by the registration of over 30 new members. I hope that members will continue to bring their friends to visit at our lectures so they may realize the educational and recreational benefits that can be derived from their attendance.

Yours for a rewarding year,

Clyde Case
President

-4-

IN MEMORIAM

William F. Schroeder, President of our Society, passed away suddenly on Sunday, February 28, 1965. With his passing we lost one of our loyal members, who took pride in his office and was at all times ready and willing to do everything in his power to promote and perpetuate the successful existence of our organization.

Mr. Schroeder was born in Winsted, Minnesota, in a log cabin. His parents were pioneers. In the early 1900's he graduated from high school, Stevens Seminary, in Glencoe, Minnesota. He later was graduated from the University of Minnesota in Chemical Engineering, and also from the University of Minnesota Pharmacy College. He was a member of the Phi Delta Chi professional fraternity, and a fifty-year member of the American Chemical Society. Mr. Schroeder became an instructor in dairy chemistry at the University School of Agriculture. He was noted for original research and patents in the field of casein manufacture.

He acquired a first-hand knowledge of geology as a result of having worked in the Wisconsin, Illinois, and Iowa area over a period of 20 years. Part of the time he was employed by a lead-zinc mining company, where he was involved in assaying and smelting processes. For most of the years he worked as food and drug inspector, making his home in Darlington, Wisconsin, which is almost in the center of the lead-zinc district.

For many years he was associated with the drug supply house of Brechet and Richter as chief pharmacist and chemist. Ill health caused him to abandon the work he loved and the confinements of a laboratory, and he became a salesman for the firm.

The open roads led to the open field, and his college work in metallurgy and geology began to have new meaning. He helped to organize and became a charter member of the Minnesota Geological Society.

World War II found him using his talents in the casein glue field on gliders in a defense plant. He was called out of retirement during the Korean War for work as a metallurgist chemical engineer at the New Brighton defense plant.

Although he has traveled extensively through the United States and Europe, William Schroeder knew and loved southeastern Wisconsin and the North Shore of Minnesota in a special way. He was a perfectionist in his field of activities, and his faithful devotion to the general welfare of our society was inspiring. Our Society has lost a valuable member.

Those who knew him became aware of his pride for his daughter Catherine (Mrs. Ronald E. Putz) and his three grandchildren, who survive him, along with two brothers and three sisters.

Build thee more stately mansions, O my soul,
As the swift seasons roll!
Leave thy low-vaulted past!
Let each new temple, nobler than the last,
Shut thee from heaven with a dome more vast,
'Till thou at length art free,
Leaving thine outgrown shell by life's unresting sea!

Oliver Wendell Holmes

Ara P. Rickmire, former Treasurer of our Society, passed away on April 5, 1965, after a long illness. His association with our organization was a fortunate one, for he was interested in a deep and intensive study not only of geology but of astronomy and related sciences. He wrote articles on his interpretation of the Precession of the Equinox, which created interest and some controversy.

Mr. Rickmire was born in Burkhardt, Wisconsin. He was graduated from the University of Wisconsin at Madison Law School in 1901 and practiced law in Minneapolis most of his life. His offices were in the Midland Bank Building.

In 1951 he and Mrs. Rickmire went back to the University of Wisconsin to the celebration of the Golden Anniversary of his class.

At the time of his death a discerning and gentle tribute was paid to Mr. Rickmire in an editorial in the Minneapolis Star, which we quote:

Every community, now and then, benefits from the quiet contribution of individuals who, without doing anything spectacular enough to attract public attention, still in their unassuming ways add something to the flavor of the community's life.

Members of this editorial/opinion page staff remember one such quiet citizen with a certain affection; regular readers of our letters to the editor may recall his name, too--A. P. Rickmire. He died last Friday, aged 87.

Mr. Rickmire used to visit this office regularly, delivering by hand letters to the editor commenting on just about every facet of human endeavor. His last published communication demanded whether there was any reason why strikes against public service corporations could not be settled by a court and jury. The last one before that began, "Gravity is a purty force in comparison with speed momentum."

He stopped writing almost five years ago, after many years of handing in his letters silently but often with a twinkle in his eye. But notice of his passing reminded us that we have missed him. The community always needs his inquiring mind.

So the versatility of the "Quiet Citizen" was noted and appreciated by many. We, too, shall miss him.

Mr. Rickmire is survived by his widow, Dorothea Rickmire.

Frank D. Gossler, a member of our Society during the past four years, passed away on December 9, 1964. He was formerly a resident of Detroit. His interest in geology was stimulated when he came to some of our field trips with members of his family in Minneapolis, and was sustained with enthusiasm through the years when he lived here.

Mr. Gossler is survived by two sons and a daughter in Detroit and two sisters, Ethelwyn Gossler and Mrs. Irene Spriesterbach in Minneapolis.

Our deepest sympathy is extended to the survivors of these members.

-5-

NEWS NOTES

Our arctic winter brought with it a complement of misfortunes, some of which seriously affected our members. On February 9th Mrs. Helene Becker, while walking out to feed birds, slipped and fell on the ice, breaking her hip. She has been hospitalized at St. Luke's hospital and will have to remain there for about another month.

On the same day Grace Benz slipped on the ice while walking to her car to go to the school where she teaches. Luckily, she did not break any bones, but was painfully bruised and spent a week in the hospital and two weeks at home. She is now able to be back at school.

Martha Peterson also slipped on the ice near her home, falling against a pile of crusted snow and severely injuring her shoulder. There were no broken bones but she suffered a great deal of discomfort from what was probably a strained ligament or muscle. She, too, is gradually improving, and with her usual fortitude keeps right on with her daily-activities.

The great quantity of snow and the inclement weather has perhaps also kept Ida Swenson from attending our meetings. It is hoped that with the coming of spring her energy will be restored so that she can again partake in the activities of the Society.

Mr. Ernest Bukofzer has been confined to the Veterans Hospital for several weeks, but is now at home recuperating. We are hopeful that he will be able to re-join the group in attending lectures before long.

Miss Elsie Hinchley has also been confined to St. John's Hospital for two weeks, but is now at home and on her way to recovery.

Our best wishes go to all above members, with the hope that they will soon be completely restored in health and energy.

LECTURE SERIES, 1964-65

The Society's Lecture Series for this year has been both interesting and informative, and the varied presentations of the speakers have aroused favorable comment and discussion.

In connection with these lectures, the following four pages of this Bulletin are devoted to printed articles by two of our speakers, Dr. Robert E. Sloan and Dr. H.F. Arneeman, and to a summary of the talks given before the group by Dr. Tibor Zoltai.

THE CRETACEOUS SYSTEM IN MINNESOTA

by Dr. Robert E. Sloan

The Cretaceous rocks of Minnesota are flat-lying, loosely consolidated sediments of variable lithology. Two formations, both showing wide facies variation are recognized: the predominantly marine Coleraine Formation in northern Minnesota and the predominantly non-marine Windrow Formation in southern Minnesota. Elsewhere in the state the strata are poorly exposed, and knowledge of their lithology, thickness, and correlation is fragmentary.

The strata rest unconformably and with profound hiatus on a surface with a maximum relief of 1,400 feet, which developed during a long interval of erosion and weathering that extended from sometime after the Devonian into the Cretaceous. In general, marine sandstones and shales deposited in the western and northern parts of the state grade eastward into estuarine, paludal, deltaic, and lacustrine sediments. The sediments lie on rocks ranging in age from Precambrian to Devonian.

The distribution and character of the sediments are interpreted to indicate that they formed in and adjacent to the Late Cretaceous sea that invaded Minnesota from the west and continued to advance eastward over an irregular terrain. In general, the vertical succession at any particular locality consists of a basal regolith developed on pre-Cretaceous bedrock, an unconformity, basal nonmarine stream deposits, and finally marine clastic sediments; but the full succession is not present at all localities.

The fossil record indicates that the strata can be correlated with the entire Colorado group of the western interior United States. Sediments that were deposited at lower present-day altitudes are Cenomanian in age, whereas those deposited on bedrock at higher altitudes are Turonian and later in age.

Cretaceous rocks occur over a large part of Minnesota. They are more or less continuous beneath glacial drift throughout the western half of the state and form numerous outliers in the eastern half. Exposures are sparse except in the Mesabi range of northern Minnesota, where Cretaceous rocks have been exposed by iron mining, at scattered localities in central and southeastern Minnesota, and in and adjacent to the Minnesota River valley.

The Cretaceous rocks have been substantial sources of mineral deposits. They have yielded moderate quantities of iron ore in the Mesabi district, northern Minnesota, and in the Fillmore County district, southeastern Minnesota; and they are a source of ceramic clays in Brown and Goodhue Counties. The total value of the contained mineral deposits that have been exploited probably exceeds \$100 million. A substantial yield of kaolinic clays from certain localities can be expected in the future.

GEMS AND MINERALS I

Dr. Tibor Zoltai

From time immemorial precious gems have been a status symbol among people of the world. The physical properties for which they are valued make gems and minerals unique. Their social properties are beauty, purity, fashion and rarity.

Precious stones in order of value are diamond, emerald (when perfect an emerald is more precious than a diamond), ruby, sapphire and opal. Their use is principally for ornament.

The early use of rough gems:

Rough gems were first cut in Babylonia not only for ornament but for magic and medical power. Now they are widely used in industry and serve as tools—diamond (drills, saws), abrasives, oscillators and lasers. Other uses are for seals, monetary units, hand-coolers and symbols.

Properties

Mineralogical Values: (1) hardness
(2) dispersion
(3) luster
(4) color

(1) Hardness: Mohs Scale (1,2, fingernail); (3, copper coin); (4,5, knife blade); (6, steel file); (7, quartz, crystal).

(2) Dispersion: Separation of white light by refraction
Index of refraction
Reflection-critical angle

(3) Luster (transparency and shine):

Metallic
Sub-metallic
Non-metallic--Adamantine
Vitreous

Pearly (mica), Silky (actinolite), Greasy (jade), Waxy (opal)

(4) Color: Constant (ruby)--idichromatic
Variable (tourmaline)--allochromatic

Color is due to absorption of light (white less absorbed color).

Semi-precious Gems:

Chrysoberil	Garnet
Spinel	Feldspar
Topaz	Quartz
Tourmaline	Jade
Zircon	Agate
Peridot	Sagenite (Mexico)
Ornamental Cabochons	

GEMS AND MINERALS II

Dr. Tibor Zoltai

Origin and Composition

1. Diamond and Graphite are both carbon. Difference is in their origin. Diamonds crystallize in a magmatic chamber under very high pressure and at elevated temperature. Diamond is found in basic Kimberlite rocks. Peridot is found in peridotite.
2. Metamorphosis--change in the mineral composition of the rock through heat and pressure. Emerald, sapphire, ruby, garnet and lapis lazuli are found in metamorphic rocks.
3. Hydro-thermal alteration--hydrothermal minerals appear in veins or cracks.

Garnet, opal, fluorite, serpentine, topaz and agates are produced in hydro-thermal activities and are usually referred to as:

Epithermal (low temperature)
Mesothermal (medium temperature)
Hypothermal (high temperature)

4. Pegmatites--these rocks contain large crystals, due to slow crystallization.
Spodumene crystal--clear and flawless--in last stages of crystallization. Quartz, feldspar, mica, and many other minerals like beryl, spodumene and zircon.
5. Erosion and sedimentation--alluvial deposition of gems.
Placer deposits in sand--gold, platinum, diamond, ruby and spinel.
Most diamonds are mined in alluvial placer deposits.
Separate diamonds from sand by using grease belts. The diamonds stick to grease.
6. Supregene alteration on surface waters--turquoise, opal, and agate.
This is a frequent type of origin of gem stones.

Rubies have been synthesized 35 years ago.

Diamonds have been synthesized during the last seven years in tungsten steel bowls under very high pressure.

Information on this page and the preceding one summarizes the content of Dr. Zoltai's talks during the 1964-65 Lecture Series.

Relationship of Soils to Environment

The type of soil found in any one place reflects the combined action of the factors of soil formation: (1) soil parent material, (2) climate, (3) vegetation, (4) topography, and (5) time.

Parent Material

The parent materials of the soils of Minnesota were primarily deposited by the action of glaciers during the Ice Age. Glaciers invaded Minnesota from both a northwesterly direction (Kewatin Glacial Center) and a northeasterly direction (Patrician Glacial Center). The advancing glaciers originating in the Kewatin Center passed over limestone deposits in southern Canada and scooped up some of these materials; for this reason the material deposited by these glaciers was usually calcareous (calcium-containing).

Glaciers emanating from the Patrician Center passed over the bedrock deposits of the Laurentian Shield area of northeastern Minnesota and southern Ontario. The material deposited by the glaciers of the Patrician Center is usually noncalcareous because of the lack of limestones in the area traversed by the glaciers. Materials deposited directly by glacial ice are known as till. Till is a non-stratified heterogeneous mixture of mineral materials closely related to the source material over which the glacier passed.

Considerable quantities of running water were expelled in front of the melting glacier. This running water deposited well-sorted outwash materials ranging in texture from gravel to sand. The composition of outwash is dependent upon the source material where the water originates and over which the water passes.

Texture of the outwash material depends on the rate of flow of the water. Outwash is found on stream terraces such as those along the Minnesota and Mississippi rivers and on outwash flats where considerable water action took place in glacial times but no large present day streams remain.

In southeastern and southwestern Minnesota there are extensive areas of silty parent materials which were deposited by wind. Immediately following the glacial periods there was a time when no vegetation grew on the area. During this time the wind could blow about and deposit materials. These silty wind-deposited materials are known as loess.

In northwestern Minnesota in the area known as the Red River Valley, large areas are covered with glacial lake deposits. In glacial times the entire Red River Valley was a large glacial lake known as Lake Agassiz. The parent materials deposited in this old lake bed vary from sandy gravelly material along the old beach lines to silty and clayey materials near the present Red River. Several other glacial lakes of lesser extent, such as glacial Lake Duluth and glacial Lake Minnesota, once were found in Minnesota. The materials deposited in glacial lakes are known as lacustrine deposits.

The preceding materials form a complex land pattern in Minnesota and provide the parent materials from which Minnesota soils, as we now see them, have developed.

*Excerpt from Extension Bulletin 278, U.S. Department of Agriculture.

ABOUT FIELD TRIPS*

by

Dr. Bert R. 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 continuing 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 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. Much planning can also be done by mail correspondence with acquaintances or executives of societies and places of business in the trip area.

Needless to say, scouting a field trip can be a challenging and rewarding experience, for it gives firsthand knowledge of the topography and terrain to be studied.

*The above article copied from Vol. XIII of the 1956-57 Minnesota Geologist is pertinent to this phase of our activities.

Man-Making

We are all blind until we see
That in the human plan
Nothing is worth the making if
It does not make the man.
Why build these cities glorious
If man unbuilded goes?
In vain we build the world, unless
The builder also grows.

Edwin Markham

GEOLOGICAL SOCIETY OF MINNESOTA—Field Trip, June 12 to June 27, 1965

Tentative Itinerary

In our trip east we will be traveling through an area noted for its geology, history, and industry.

From the Twin Cities we will proceed into Wisconsin over the Onecota escarpment through the Wisconsin Dells to Madison, where we will visit the United States Forest Products Laboratories. From Madison we will go through the sand dunes and salt marsh area of Michigan to Ann Arbor, to visit the University of Michigan Science Department or the College of Mining and Technology. A short journey from Ann Arbor will bring us to Dearborn and Detroit, where we hope to take a conducted tour through the Chrysler Assembly Plant, and then visit the Ford Museum and Laboratories at Greenfield Village.

A scenic trip from Detroit through Canada will take us to Niagara Falls and then to Buffalo. At Buffalo we plan to visit the Buffalo China Company plant and the Museum of Science. The trip from Buffalo will be through the scenic Finger Lakes region via Watkins Glen and Seneca Lake, down to Corning Glass Works. This is the plant that made the 200-inch Hale telescope lens for Mt. Palomar, and now produces the nose cones for space ships. From Corning we will go to Albany to visit the New York State Education Building. From Albany we will go via Kingston and Newburg to West Point and the Bear Mountains, down the Palisades Parkway on the Hudson River, to the Washington Bridge and New York City.

While in New York City we will visit the Stuebens Glass Plant and arrange at least one sight-seeing trip within the city. The rest of the time will be spent visiting the World's Fair. All exhibits there that we will attend are free. Among those that we expect to see are the United States Pavilion, General Motors Futurama, General Electric double feature, Ford Motor Co., Bell Telephone Co. (a wing of this building is said to be an architectural gem), the IBM People's Wall, Festival of Gas, DuPont's wonderful Wall of Chemistry, Johnson's Wax—"To be Alive". There are free movies: United Airlines' "From Here to There"; Kodak's "The Searching Eye"; Abbott Laboratories' "The Chemical Man". Then there are the foreign exhibits, best of which are reported to be those of Spain, the Vatican, Mexico, Thailand, Japan, Ireland, India, Africa, Jordan, and Israel.

As we go south through New Jersey we will visit the Jackson Perkins acres of rose gardens, then will go to Trenton to see the Lenox Belleek China factories. After going to Philadelphia, where there is much of historical interest and where we will visit the University of Pennsylvania, we will take the turnpike to Pittsburgh, where we will visit the Jones-Laughlin Steel Mills. If we are allowed to visit any of the coal mines along the way, we shall do so.

At Cleveland we hope to visit the Aluminum Company of America or the Republic Steel Company at Canton, Ohio. Woodville, Ohio, is known as the lime center of the world. At Fort Wayne we expect to visit lead and zinc mines or stone and gravel quarries. Indiana is known for the fine white Bedford Stone which is used in the construction of buildings at the University of Indiana. If open to visitors, we will go through a soft coal mine in the area of Davenport. Iowa is known for its limestone quarries, and one of the largest gypsum quarries and plants is located at Ft. Dodge.

We shall then be homeward bound through northern Iowa and Rochester, Minnesota.

THE AMERICAN FEDERATION

CODE OF ETHICS

(For the Geologist and Rock Hound)

- I WILL respect both private and public property and will do no collecting on privately-owned land without the owner's permission.
- I WILL keep informed on all laws, regulations, and rules governing collecting on public lands and will observe them.
- I WILL, to the best of my ability, ascertain the boundary lines of property on which I intend to collect.
- I WILL use no firearms or blasting material in collecting areas.
- I WILL cause no willful damage to property of any kind--fences, signs, buildings, etc.
- I WILL leave all gates as found.
- I WILL build fires in designated or safe places only and will be certain that they are completely extinguished before I leave the area.
- I WILL discard no burning material--matches, cigarettes, etc.
- I WILL fill all excavation holes which may be dangerous to livestock.
- I WILL not contaminate wells, creeks, or other water supplies.
- I WILL cause no willful damage to collecting materials and will take home only what I can reasonably use.
- I WILL support rockhound project HELP--Help Eliminate Litter, Please--and will leave all collecting areas devoid of litter, regardless of how found.
- I WILL cooperate with field trip leaders and those in designated authority in all collecting areas.
- I WILL report to my club or Federation officers, Bureau of Land Management, or other proper authorities, any deposit of petrified wood or other material on public lands which should be protected for the enjoyment of future generations and for public educational and scientific purposes.
- I WILL appreciate and protect our heritage of natural resources.
- I WILL observe the "Golden Rule", will use "Good Outdoor Manners", and will at all times conduct myself in a manner which will add to the stature and "Public Image" of rockhounds everywhere.

This is a composite Code of Ethics, selected from the many sent in by clubs from all parts of the country, with the addition of a few items to bring it into conformity with presently existing conditions. It is hoped that all Federations and Societies will adopt and publicize this Code. Voluntary conformity by all collectors on field trips will ensure continued use of collecting areas and will build invaluable good will.

Albert Keen, President, AFMS

GEOLOGICAL SOCIETY OF MINNESOTA

TREASURER'S REPORT

March 29, 1965

Balance on hand at 1964 Banquet \$815.34

Receipts from

Membership Dues	532.00	
Sale of books & rocks	72.25	
Trips & Picnic	113.04	
Interest on Savings	15.52	
		732.81
		<u>\$1,548.15</u>

Disbursements

Lectures	220.00	
Postage, Supplies	390.06	
Dues to Midwest Fed- eration	25.00	
Typewriter (to Mr. Koppen	20.00	
Bank charges	3.40	
		658.46

Balance on hand \$889.69

Balance in checking account, Midland Bank 326.90

Balance in savings, Farmers & Mechanics 562.79
\$889.69

Set aside for Geological Marker 400.00

Balance available \$489.69

Charles Havill, Treasurer

TENTATIVE PROGRAM OF SUMMER FIELD TRIPS*

1965

May	Granites and stones in Twin City buildings
June	New York, including World's Fair, and adjacent states
July	St. Cloud area
August	Annual picnic at home of Mr. & Mrs. King on the St. Croix
Sept.	Quartzite in southwestern Minnesota
Oct.	North Shore or Brainerd area

*Subject to change if necessary

University of Minnesota Library

SOME RECENT ADDITIONS TO THE GEOLOGY LIBRARY, PILLSBURY HALL

- Ager, D. V. ----- Principles of Paleocology
McGraw-Hill, 1963
- Albritton, C. C. ----- The Fabric of Geology
Addison-Wesley, 1963
- American Association for
the Advancement of Science----- Great Lakes Basin. Washington, D. C., 1962
- American Association of
Petroleum Geologists----- Backbone of the Americas (Its Memoirs 2)
Tulsa, Oklahoma, 1963
- American Geological----- Directory of Geo-science Films. 2nd ed.
Institute Washington, D. C., 1962
- Andrews, Allen----- Earthquake
Angus and Robertson, Ltd., London, 1963
- Arizona Developing Board----- Oil, Gas, and Helium in Arizona
Phoenix, Arizona, 1961 (?)
- Arrowsmith, R.----- Mines of the Old Southwest
Sante Fe, Stagecoach Press, 1963
- Asphalt Institute----- Soils Manual for Design of Asphalt Pavement Structures
College Park, Md., 1961
- Bain, G. W.----- The Flow of Time in the Connecticut Valley
Connecticut Valley History Museum, 1965
- Baldwin, R. B.----- The Measure of the Moon
University of Chicago Press, 1963
- Ball, S. H.----- A Roman Book on Precious Stones
Los Angeles, Calif., Gemological Institute of America,
1950
- Beaty, W. B.----- Mineral Resource Data in the Western States. 2nd ed.
Stanford Research Institute, 1962
- Beerbower, J. R.----- Search for the Past
Prentice Hall, 1960
- Belousson, V. V.----- Basic Problems in Geotectonics
McGraw-Hill, 1962
- Bennett, R.----- Quest for Ore
Denison, 1963
- Beringer, J. B. A.----- The Living Stones of Dr. Johann Bartholomew
University of California Press, 1963
- Boswell, P. G. E.----- Muddy Sediments. Some Geotechnical Studies for Geologists,
Engineers, & Soil Scientists, Cambridge Heffer, 1962
- Bracewell, S.----- Bauxite, Alumina, and Aluminum
H.M.S.O., London, 1962
- Bray, E.----- A Million Years in Minnesota. The Geological History of
St. Paul, Minn., The Science Museum, 1962. The State.
- Bruum, Per----- Stability of Coastal Inlets
Amsterdam, North Holland Publishing Co., 1960
- Bullen, K.----- An Introduction to the Theory of Seismology. 3rd ed.
Cambridge, 1963
- Carrington, Richard----- The Story of our Earth. Harpers and Brothers, N.Y., 1956
- Clark, G. R.----- The Study of Oil in the Field. 4th ed., Oxford, 1957
- Colbert, E. H.----- Evolution of the Vertebrates. John Wiley & Son, N.Y., 1955
- Coulomb, J.----- The Physical Constitution of the Earth
Hafner, 1963

ADDITIONS TO THE GEOLOGY LIBRARY, cont.

- Cromie, W. J. ----- Exploring the Secrets of the Sea
Prentice-Hall, 1962
- Cronels, C. G. ----- Down to Earth. An Introduction to Geology
University of Chicago, 1961
- Darwin, C. R. ----- The Structure and Distribution of Coral Reefs
University of California Press, 1962
- Davies, A. M. ----- An Introduction to Paleontology. 3rd ed.
Allen and Unwin, 1962
- Deer, W. A. ----- Rock Forming Minerals, Vol. 4, Framework Silicates
Longmans, 1963
- Defant, A. ----- Physical Oceanography
Pergamon, 1961
- Delevoryas, T. ----- Morphology and Evolution of Fossil Plants
Holt, 1962
- Donnay, J. D. H. ----- Crystal Data. Rev. ed.
Polycrystal Book Service, 1963
- Donnelly, T. A., ed. ----- The Science Problems and Program in Current Research
University of Chicago Press, 1964
- Drier, R. W. ----- Prehistoric Copper Mining in the Lake Superior Region
Calumet, Mich., Drier and Temple, 1961
- Drury, W. E. ----- Bog Flats and Physiographic Processes in the Upper
Kuskokwin River Region, Alaska. Harvard U., 1956
- Dunbar, C. O. ----- Historical Geology
John Wiley & Sons, Inc., N. Y., 1960
- Dyson, J. L. ----- The world of ice. Knopf, 1962
- Eardley, A. J. ----- Structural Geology of North America. 2nd ed.
Harper & Row, 1962
- Ehrlich, P. R. ----- The Process of Evolution
McGraw-Hill, 1963
- Eklund, C. R. ----- Antarctica; Polar Research and Discovery during the
International Geophysical Year
Holt, Rinehart, 1963
- Ekman, L. C. ----- Scenic Geology of the Pacific Northwest
Portland, Ore., Binford & Mort, 1962
- Engel, A. E. J. ----- Petrologic Studies; A Volume in Honor of A. F.
Buddington. Geological Society of America, 1962
- Fenton, C. L. and Adams, M. ----- The Fossil Book. Doubleday and Co., 1961
- Folsom, Franklin ----- Exploring American Caves. Collier, 1962
- Freya, D. G. ----- Limnology of North America
University of Wisconsin Press, 1963
- Furon, R. ----- The Geology of Africa. Oliver and Boyd, 1963
- Fyfe, Wm. ----- Geochemistry of Solids; An Introduction
McGraw-Hill, 1964
- Gamow, G. ----- A Planet Called Earth. Viking Press, 1963
- Geiss, J. ----- Earth Science and Meteorites.
Wiley, 1963
- Geological Society of
Australia ----- The Geology of South Australia
Melbourne University Press, 1958
- Grabau, A. W. ----- The World We Live In; A New Interpretation of Earth
History. Geological Society of China, 1961

GEOLOGICAL SOCIETY OF MINNESOTA
5450 BRYANT AVENUE NORTH
MINNEAPOLIS, MINNESOTA 55430



Mr. & Mrs. Fred W. Hallberg,
2294 Commonwealth Ave.,
St Paul, Minn., 55108.