



THE MINNESOTA GEOLOGIST  
OFFICIAL BULLETIN  
OF  
THE GEOLOGICAL SOCIETY OF MINNESOTA

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THE ORIGIN OF ALL SCIENCE IS IN THE DESIRE TO KNOW CAUSES.

William Hazlitt.

GEOLOGICAL SOCIETY OF MINNESOTA

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MEETINGS: October to May inclusive, 7:30 P.M. every 2nd and 4th 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.

AFFILIATE MEMBER

MIDWEST FEDERATION OF MINERALOGICAL AND GEOLOGICAL SOCIETIES

and

THE AMERICAN FEDERATION OF MINERALOGICAL SOCIETIES

\* Deceased

# Bulletin Board

## PROPOSED FIELD TRIP SCHEDULE FOR 1958

- |            |   |   |
|------------|---|---|
| May 18     | Faults in rock structures along the St. Croix River in the vicinity of Copas                                | Leader: Dr. Robert Cloen                            |
| May 25     | Minnehaha Falls   | Leader: Jos. W. Zalusky                             |
| June 8     | No trip. The Anoka Sand Dunes originally scheduled for this date will be combined with the Sept. 21st trip. |   |
| June 14-28 | Nebraska-Wyoming trip to the Teton Mountains and Jackson Hole country                                       | Leaders: Mr. & Mrs. L. W. King                      |
| July 13    | Pine City lava flows  | Leader: Mr. F. B. Heilman                           |
| July 26-27 | Rib Hill, Wausau Wisconsin  | Leader: Mr. Hal McWethy                             |
| Aug. 9-10  | Ortonville Minn.  | Leader: Dr. Bert Carlson                            |
| Aug. 24    | Annual Picnic   | At the Lawrence King's summer home on the St. Croix |
| Sept. 6-7  | Copper Falls Wisconsin  | Leaders: Miss Elsie Hinchley and Mr. A. Roney       |
| Sept. 21   | Anoka Sand Dunes and Cedar Creek Forest   | Leader: Mr. J. O. Engen                             |
| Oct. 4-5   | Cuyuna Iron Range   | Leader: Mr. E. L. Koppen                            |

Report of Hal E. McWethy.

The members of our Society will note that changes have been made in our Board of Directors and we now have a new President. These changes are the result of action of the Society at its annual meeting on April 28th and of its Board of Directors which met directly after the Society's annual meeting.

Mr. Koppen was selected as your President for the ensuing year, and new members of the Board are Miss Grace Benz and Mr. J. O. Engen. Dr. Carlson and Mr. Havill, reelected to the Board, will serve respectively as Secretary and Vice President; and Mr. Rickmire will again serve as Treasurer. This will make a strong Board to carry on the activities of our club for the 1958-59 year. We who are retiring, including Mr. Howard, Mr. Pettengill and I, as President extend to the new regime our wishes for a very successful year.

It may be well in this report to review briefly some of the outstanding features of our work during the past year. The highlight, of course, centers around the 12 lectures on Structural Geology by Dr. E. J. Craddock Jr. suitably climaxed by the final lecture on April 21 on Structural Geology of Minnesota by Dr. George A. Thiel.

During the summer of 1957 there were held 10 field trips and the annual picnic at the St. Croix cottage of Mr. & Mrs. L. W. King. We had a total attendance of approximately 432 persons. This demonstrates that there has been a fine interest taken in these field trips and also demonstrates that their leaders were well equipped to give our membership the proper slant on geological questions that were involved.

Our treasurer's report, appearing elsewhere in this bulletin, indicates that our finances are in strong position. We have over \$1500 in our savings account and nearly \$100 in our checking account.

We should mention the new tag board prepared by Vice President Havill, the use of which has accounted for a considerable increase in the ease with which we have become acquainted with each other as the lectures have proceeded during the year. Our new membership directory also contributed to the facility with which our members were able to communicate with each other.

In accordance with notices sent to all members, it was proposed that certain changes be made in our Articles of Incorporation. These were prepared by Mr. Howard and were favorably acted upon at the annual meeting on April 28. Among other items, these changes permit the Board to elect from the membership at large officers filling the positions of President, Vice-President, Secretary and Treasurer, if in the judgment of the Board, such action seems desirable.

Mr. Pettengill has prepared a program of 10 field trips for the summer of 1958, a list of which is included elsewhere in this bulletin. We have again been favored by an invitation to the St. Croix River cottage of Mr. and Mrs. King for our annual picnic on August 24. This will be one of the red letter days for 1958.

Our annual meeting at the Junior Ballroom of the Minnesota Union, University of Minnesota, was attended by some 95 of our members, friends and guests; and was, I believe, a profitable one for all who participated. A forceful address was given by Dr. Thomas S. Irvine Jr., assistant professor of Mechanical Engineering, University of Minnesota, on the subject "Satellite Programs for the Geophysical Year". This was the 20th anniversary of the formation of our Minnesota Geological Society, and our committee on decorations, headed by Miss Hinchley and Miss Paschke, saw to it that our tables were tastefully decorated with candles and flowers and that the 20th anniversary was recognized. In addition, Mrs. Edward P. Burch, widow of the founder of our Society, who was present as our guest, received in memory of her late husband a corsage fittingly presented by Mrs. H. S. Sommers, one of the charter members of our Society. Also as our guests for the evening, we were privileged to entertain some 10 members of the staff of the Department of Geology of the University. We are much indebted to Dr. Thiel and his staff for their continued interest in our Society.

I consider it a distinct privilege to have served during the past year for the second time as your President. It has been a pleasure. I feel that I have received the cooperation of all members including that of the Board of Directors, and I desire to express my appreciation for all your kindnesses. I shall continue my close interest in the Society. With "Kop" in as President, and "Mrs. Kop" continuing as our Editor in Chief our Society is in good hands. We wish them every success.

#### A MESSAGE FROM YOUR PRESIDENT

As you know, I am one of the editors of the Minnesota Geologist, the official publication of our Society. As such, I am in a position to read the publications of a great many other clubs and Societies like ours because we exchange publications. After reading them all from cover to cover as they arrive, one gets to form some kind of an idea as to what kind of an organization each one is. What their activities and interests are, the amount of enthusiasm in each one, and whether or not they seem to be enjoying themselves.

Among all the clubs and Societies with which we exchange publications, and they range all the way from Michigan to California, I believe our Society is unique.

I know of no other organization that has carried out a program of geological markers throughout the state as we have.

I know of no other organization that has a continuing program year after year, of lectures on some facet of geology by professional geologists every two weeks during the winter months, and field trips every two weeks during the summer months. In addition each year we have a "long trip" to such places as British Columbia, The Grand Canyon, Quebec, The Great Smoky Mountains, and this year to Jackson Hole and the Wind River country in Wyoming.

And finally, I know of no other organization that has had the continued support and advice and assistance of the Department of Geology of the State University over the years such as we have.

Therefore I believe we are a unique organization, and we should all be proud of our Society. I personally, feel honored to be its President.

Elmer L. Koppen.

## THE ROMANCE of NICKEL

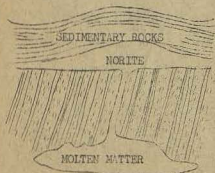
### IN the BEGINNING

In that bleak belt of rocky country which lies to the north of the city of Sudbury in Canada, some of the world's richest mineral deposits have been discovered during the past sixty years. How did they get there? It was during one of those periods, ages ago, when the earth's outer crust twisted and buckled and was shaken by volcanic disturbances, and mountains were formed.

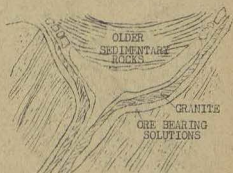
During that period, a mass of molten rock deep down inside the earth came under terrific pressure, and was forced towards the earth's surface where there happened to be a line of weakness in the earth's crust. As this molten rock was pushed upwards, it came in contact with the under side of thick layers of sedimentary rocks and spread out, forming a large, oval-shaped mass that gradually began to cool and harden into solid crystalline rock known as norite.

The pressure inside the earth continued. The earth's crust twisted and folded again. A second mass of molten rock, this time of granite type, was pushed toward the earth's surface. It forced its way into the cracks and crushed areas of the rocks, particularly along the margins of the norite. There it formed irregular masses and dikes and began to cool and harden into granite. Some time during this period the norite mass was caught in the gigantic vise of a major fold in the earth's crust and was folded and bellied downward into the centre of the bowl.

While great earth forces continued to twist and bend the rocks, a third mass of hot material was forced towards the earth's surface. Apparently it was composed of hot chemical solutions and gases under enormous pressures. These were forced into the cracks and crushed areas along the margins of the norite and the granite masses, and into clefts in the nearby rocks.



Molten matter, forced up through the earth's crust, came in contact with the under side of layers of overlying sedimentary rocks and spread out.



Cross section of Sudbury Basin as geologists believe it exists today.

These solutions carried the copper and nickel and other important elements which were deposited in the crevices and in the nearby rocks. Thus the ore bodies containing these metals came into being under a deep cover of volcanic and sedimentary rocks.

As the ages passed and the great disturbances of that particular period subsided, nature went to work to tear down that which she had so laboriously and fantastically fashioned. Great volumes of rock material were gradually worn away by the rain, wind and ice, and as these rocks disappeared the norite, granite and the ore bodies came to light. The great oval-shaped outcrop of norite, with the sediments within and the ore bodies at the outer margins and along the zones where the rocks had previously been cracked and crushed, has been named the Sudbury Basin.

The surface, as man sees it today, is just that part which happens to be exposed at this time by the erosional processes. Study of this surface makes one wonder what might have existed above and been carried away, and what now exists below.

Thus have geologists after years of study of this surface and the mines in this locality constructed the theory regarding the formation of the great ore bodies of nickel, copper and other metals.

Can it be that Divine Providence, in the beginning of things, pointed a finger at this spot on the spinning globe and said, "Here must rich stores of nickel be hidden away, so that, as the great plan is unfolded down through the ages, this metal may be brought to light to play a deciding part in the affairs of men that are to be?"

From "The Romance of Nickel"  
published by  
The International Nickel Co. Inc.,  
New York

PLAN TO ATTEND THE MIDWEST FEDERATION IF YOU POSSIBLY CAN

THE DATES - June 19, 20, 21 & 22.

THE PLACE - Community High School, Downers Grove Illinois.

THE HOST SOCIETY - "ESCONI", Earth Science Club of Northern Ills.  
4729 Prince St., Downers Grove Ills.

YOU'LL SEE - MINERALS, FOSSILS, GEMS, ARTIFACTS, JEWELRY, CRYSTALS.

The program consists of lectures, movies, slides and field trips.

For further information call your Editors,

WE 9-6953.

J.S. MINN (24) MINNEAPOLIS MINN



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