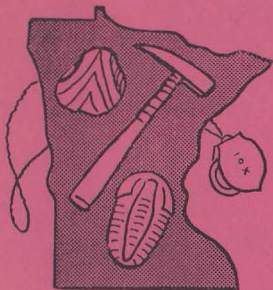


WINTER -- 1985



Geological Society
of Minnesota

NEWS

91

Geological Society of Minnesota

MINNEAPOLIS, MINNESOTA



FIRST CLASS

EDITORS:

GEORGE AND GOLDIE JOHNSON
5146 - 197th Avenue N. E.
Wyoming, Minnesota 55092

LOWE, Dr. Alex & Marlys
2206 Caroline Lane
South St. Paul, MN 55075

PLEASE FORWARD



Geological Society of Minnesota

1711 Marshall Avenue, St. Paul, Mn. 55104

OFFICERS:

Pres. Eva Selander
V. Pres. Warren Mitchell
Treas. Dwight Robinson
Sec'y. Marlys Lowe

DIRECTORS:

Jeff Garry
Bob Gunville
George Johnson
Jack Nesheim
Dick Uthe

NEWSLETTER: November, December 1985, January 1986



FROM --
YOUR --
PRESIDENT

One of our GSM highlights this year is the fact that we have 45 new members. Much of this is due to a remarkably interesting booth at the State Fair, to the members tending the booth, and to a huge mailing to 410 requests for information. A special newsletter mailing was sent out from Mary Kimball's home one evening with a large crew doing the addressing and stamping. We are happy to have the new members and to see the Society grow.

We appreciate the hospitality of those who have been serving coffee and cookies. We are in need of four additional members who can bring coffee airpots to our lectures. Please contact Eva Selander, Phone 729-2130, if you are available.

The upcoming lectures will be very interesting and even though the weather may be impossible, we'll see you there.

Have a Happy Holiday Season.

Eva Selander, President



* * * * *



ANNUAL MEETING

The Annual Meeting of GSM was held September 23 at the Viking Village Smorgasbord Restaurant in St. Paul. Five members were elected to the Board of Directors. Jeff Garry, Goldie Johnson, and Marion Marien were elected for a two-year term. Warren Mitchell and Dwight Robinson were elected for a second two-year term.

Bob Gunville entertained the audience with a beautiful slide presentation of a hike through Gracier Park, Montana, and the Waterton Lakes Park in Alberta, Canada. This presentation was a preview of a field trip that Bob will lead next summer, July 21 - 23. We wish to thank Bob for his willingness to share his talents and experiences with us.

NEW OFFICERS

At the October GSM Board Meeting, the following officers were elected: Warren Mitchell, President; Jack Nesheim, Vice-president; Marlys Lowe, Secretary; and Dwight Robinson, Treasurer. We are happy to have these capable people lead us during the coming year.



MEMBERSHIP

Keep those membership dues coming. Bob Handschin, our Membership Secretary, reports that many members have renewed their memberships at our fall lectures or have mailed in their dues. Our thanks for your promptness, and also to the 45 new members who have signed up. We have a full schedule of inviting programs ahead and another summer of exciting field trips coming up. Membership dues cover our necessary expenses. They're a bargain.



To those of you who have not yet renewed your membership, you'll be receiving a reminder by December 1. Please respond so that your name can be in our 1986 ROSTER which will be available early in January. Bob Handschin thanks you in advance. If you're mailing in your dues, please send the check made out to Geological Society of Minnesota to:

Bob Handschin
2029 Edgerton Road
St. Paul, Mn. 55117

Bob will also take your check during the lecture sessions.

* * * * *

PUBLIC LECTURES



In our last newsletter you received a copy of the 1985-86 Program. The series EARTH: 3,000,000,000 YEARS OF EVOLUTION by Dr. Robert Sloan, Professor of Geology, University of Minnesota was very well attended. We thank Dr. Sloan for his informative and interesting lectures and slides. We are looking forward to hearing from him again at our Spring Banquet when he will tell us of his work in China.

Meetings: 7:30 pm, Mondays, December 2; January 13, 27;
February 10, 24; March 10, 24; April 7.

Where: Rooms 131 and 170 Physics Building, U of M. From January through April the room will be announced at the meetings and in the news media.

Copies of the GSM 1985-86 Program may be picked up at the lecture if you misplaced your copy.





COMMITTEES

The Board is in the process of forming new committees for the coming year. If you are approached to serve on a committee, please give it some serious and positive thought. GSM needs your ideas and help in order to progress and grow.

NEWS OF MEMBERS



Dr. Barbara Gudmundson, GSM President 1980, has received from Fulbright a Senior Research Fellowship grant to work on diatom herbarium in Iceland next year. She will study the collection, set up curating, organize materials, and catalogue them and prepare a manual. Congratulations, Barb.

Paul Stor, a retired science teacher and long time member of GSM, is now residing at Lake Ridge Care Center, Room 511, 2727 North Victoria, St. Paul, MN. 55113. An active member since 1950, Paul at age 89 has been living alone in his own house until an injury from a fall and subsequent hospitalization this fall.

Paul has several hobbies, one being Gingko tree nuts, which he has shared with many members. He attended lectures and field trips and had his own Runestone booth at the State Fair. Friends from Jehovah Lutheran Church have been assisting him. Cards or calls are appreciated (Phone 483-5431).

* * * * *

ORGANIZATIONAL ANNOUNCEMENTS

ANNOUNCING



The December meeting of the Minnesota Archeological Society features Orrin Shane of the Science Museum of Minnesota as speaker. He will talk on what happens to artifacts once they are in the museum.

Meeting Place: Hamline University
Giddens Learning Center
Snelling and Hewitt, St. Paul

Date: December 5

Time: 7:30 pm Social Hour
8:00 pm Meeting Begins

For more information, phone 925-0436.

Announcements of upcoming projects of the Society of Economic Paleontologists and Mineralogists have been received by GSM. Several of these are listed below. Members interested in these projects may contact Joni C. Merkel, Continuing Education Coordinator, P.O. Box 4756, Tulsa, OK. 74159-0756 for the complete list for 1986.

March 6-7, 1986 SEPM Short Course "Modern and Ancient Deep Sea Fan Sedimentation," Calgary, Alberta. Contact: Joni C. Merkel, Society of Economic Paleontologists and Mineralogists, P.O. Box 4756, Tulsa, Oklahoma 74159-0756. (918) 743-2498

April 7-9, 1986 SEPM Short Course "Platform Margin and Deep Water Carbonates," Calgary, Alberta. Contact: Joni C. Merkel, Society of Economic Paleontologists. and Mineralogists, P.O. Box 4756, Tulsa, Oklahoma 74159-0756. (918) 743-2498

Hot time in Montana Digging for dinosaurs

By Darlene Gorrill

Accompanying geology professor Robert Sloan to Montana can be a real travel nightmare—no Howard Johnson's or hot tubs here. The nearest gas station is 70 miles away. During the day, even brief exposure to the sun means a burn of uncomfortable proportions; at night, the cold comes, bringing with it 50- to 70-mile-per-hour winds.

Sloan, of course, really isn't on a vacation, even though he's visited the same place almost every summer since 1959. He and his ever-changing caravan of anxious explorers, mostly graduate students, have a scientific purpose—to search out and find dinosaurs, or, more accurately, the remains of dinosaurs.

The missions have been successful—the remains are almost as common as the dinosaurs themselves once were. Using this wealth of fossils, Sloan pursued a new research approach; he examined all environmental and ecological factors that might have contributed to the dinosaurs' demise.

Those who cling to theories about dinosaurs as romantically obsessed, suicidal creatures may be disappointed in Sloan's conclusions. Virtually everyone has pet theories about dinosaur deaths ranging from disease to racial old age, poison gases, comets and meteorites, climate changes, cosmic radiation, floods, shifts in the earth's poles, continental drift, sunspots, and a mass of other unconventional theories, labeled "paleoweltschmerz."

Sloan's searches for dinosaur, plant, and early mammal remains in Montana and more recently in China have resulted in a more down-to-earth extinction explanation.

"Dinosaurs dropped off one by one," Sloan said. Dinosaur extinction was hardly dramatic—they left with a whimper, not a bang. Basically the prehistoric creatures were the victims of an incredible streak of bad luck, an example of Murphy's law gone wild.

But if fate had been on their side, dinosaurs might very well have been our ancestors instead of mammals, Sloan said. In their prime, dinosaurs stalked the forest with awesome force. Despite its size, *Tyrannosaurus rex* could run 50 miles per hour. Dinosaurs had large brains, and some came equipped with a thumb and fingers.

For about 10 million years, dinosaurs didn't have many worries. They lived a

relatively easy-going life in the then-tropical rain forest zone of North America. But changes gradually began to disrupt their comfortable routines.

First, a significant shift in the weather occurred. The temperature became cooler and more variable (dropping from 86 degrees Fahrenheit to 41 degrees Fahrenheit within 20 million years). The warm rain forest was transformed into our familiar coniferous forest. This climatic switch meant a decrease in the dinosaurs' food supply.

And, as if that wasn't enough adversity, the precipitous arrival of a large asteroid further contributed to the decrease in available food sources. Although now fewer and fewer in numbers, dinosaurs still managed to survive.

But man's early relatives supplied the final shove into oblivion for dinosaurs. Many varieties of small mammals were becoming common in North America. Because of their size, they adjusted much better to the changing environment. "They took, quite literally, a bite out of the dinosaur's food supply," Sloan said.

By the end of the Cretaceous period, some 64 million years ago, few dinosaurs roamed North America. But even these persistent survivors ultimately lost out to what would be the fastest evolution on fossil record. Mammals kept multiplying and were changing form all the time. This was no slow process; the mammals evolved before the dinosaurs really had a chance to figure out what was happening.

"The change was too fast," Sloan said. "The rug was pulled out from underneath them. It's never really a question of animal adaptation. It's a question of how rapidly selection can operate."

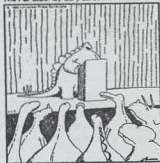
"Extinction is the rule rather than the exception," Sloan wrote in 1966, "and we can, if we choose, calculate a sort of half-life of a species. A long, continued survival of a group of animals is a rare event. Only some .003 percent of the species of vertebrates that lived at the end of the Paleozoic era, some 230 million years ago, have any living descendants at all."

For Sloan, dinosaur hunting always has been a fascinating pursuit.

"When I was 3, my father took me to the World's Fair. I remember him carrying me on his shoulders, and I looked up and there was a life-size model of a *brontosaurus*." Inside the exhibit, there

"The picture's pretty bleak, gentlemen. . . . The world's climates are changing, the mammals are taking over, and we all have a brain about the size of a walnut."

The Fair Side / By Gary Larson



"Hot Time in Montana"
"DIGGING FOR DINOSAURS"
by Darlene Gorrill
from the Summer-Fall
1985 issue of ITEMS
From the Institute
of Technology,
U of M.



"Most peculiar, Sidney . . . another scattering of cub scout attire."

DINOSAUR

was even more to ignite the young boy's interest: a whole exhibit on paleontology.

After that introduction, Sloan spent most of his spare weekend time roaming around Chicago's Field Museum of Natural History. He received his Ph.D. in geology from the University of Chicago in 1953.

Later that year, he began his career as an instructor at the University of Minnesota. He then decided to begin a systematic investigation of dinosaurs.

Getting started wasn't easy. Because of the proliferation of wild theories, few organizations were willing to fund research on dinosaurs. But the money finally became available, and a group set out to find a dinosaur for the Science Museum in St. Paul.

That was actually simpler than it sounds. Group members discovered the first dinosaur, now on exhibit in the Science Museum, only a few hours after landing in Montana. "They're extremely common out there," Sloan said.

But fossil digging—finding traces of smaller plants and animals—requires patience and the right tools. Sloan says his wide-brimmed white hat, which makes him easy to spot on campus, is also perfect for dinosaur hunting. He pulls the wide flaps down to cut the Montana sun's fierce glare.

To carefully chip away at the mountains, researchers turn to the reliable penknife. Diggers use shovels sparingly, because they have the potential to destroy delicate fossils. Once soil is collected, researchers fill a screen box with the debris. Water is run through the box to wash away the soil, and bone and tooth remnants are left behind. Researchers have learned to identify fossils from each of the 93 different kinds of vertebrate as quickly as coin collectors can spot priceless money.

This knowledge, work, and care has resulted in some important scientific findings. "It was a great day when we found the oldest primate in the world," Sloan said. And one that he won't easily forget. The team climbed a steep Montana hill, 120 feet high with a 50 degree slope, and quarried 10 tons of sand from the top down to the bottom of the hill, and then sifted through the sand. For this effort, they decided to name the first primate Purgatorius after the steep slope, which they had come to call Purgatory Hill.

While the riddle of the dinosaurs may be solved, Sloan wants to continue studying the second half of the puzzle—the development of the first mammals. He



Photo by Mike Zerby, courtesy of the Minneapolis Star and Tribune

Sloan sifts through a box of bone scraps. Sloan and his dinosaur-hunting crew can identify fossils from each of the 93 different kinds of vertebrate as quickly as coin collectors can spot priceless money.

recently traveled to China to study mammals that developed at the same time as those in North America. He'll go

back to China in January, after returning from another summer in Montana, digging in the hot sun.