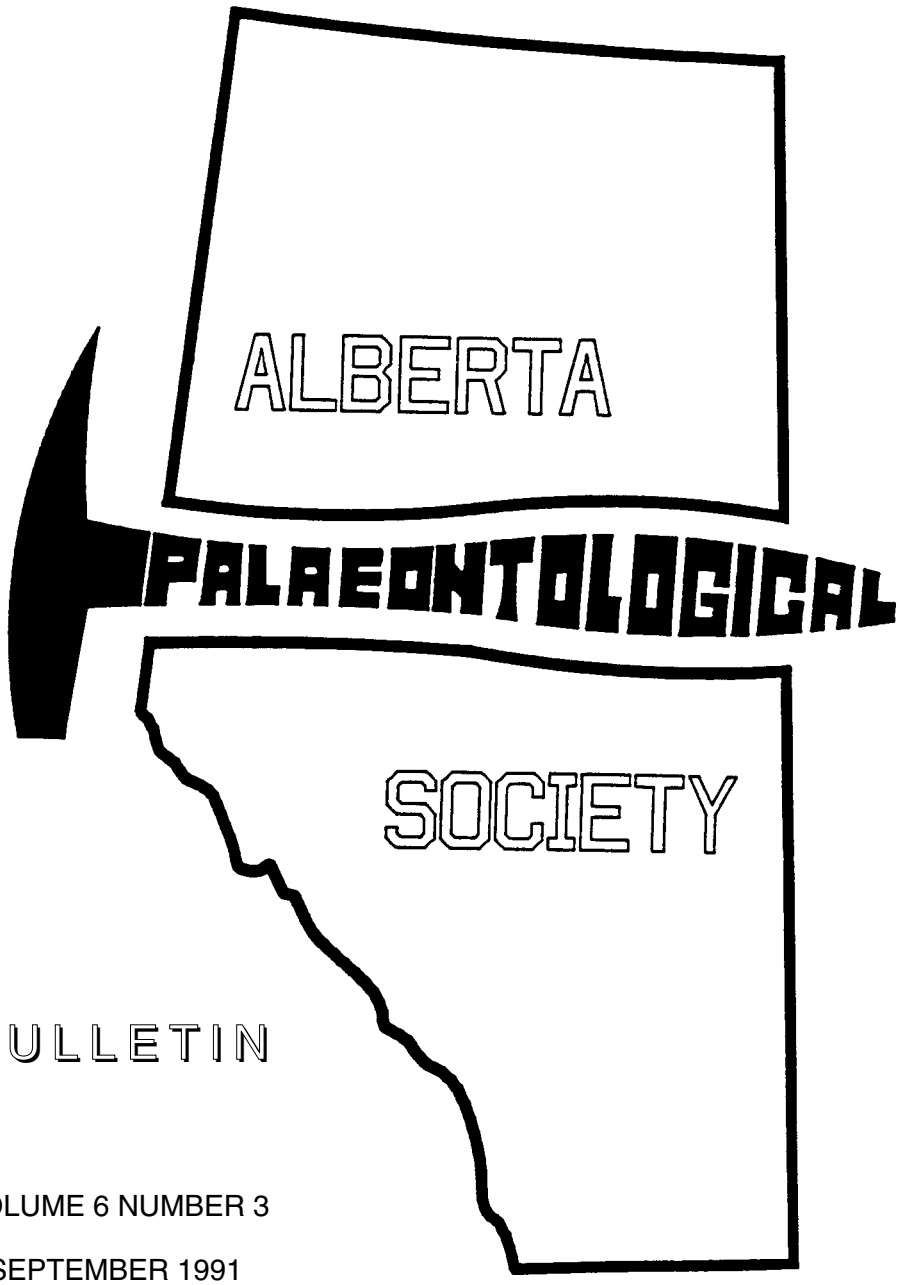

BULLETIN

VOLUME 6 NUMBER 3

SEPTEMBER 1991

ALBERTA PALAEONTOLOGICAL SOCIETY

The Society was incorporated in 1986, as a non-profit organization formed to:

a. Promote the science of palaeontology through study and education.
b. Make contributions to the science by:
    1) discovery
    2) collection
    3) description
    4) education of the general public
    5) preservation of material for study and the future.
c. Provide information and expertise to other collectors.
d. Work with professionals at museums and universities to add to the paleontological collections of the province (preserve Alberta's heritage)

MEMBERSHIP: Any person with a sincere interest in palaeontology is eligible to present their application for membership in the Society.

Single membership	$10.00 annually
Family or institution	$15.00 annually

THE BULLETIN WILL BE PUBLISHED QUARTERLY: March, June, September, and December.
Deadline for submitting material for publication is the 15th of the month prior to publication.

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NOTICE: Readers are advised that opinions expressed in the articles are those of the author and do not necessarily reflect the viewpoint of the Society.

PRESIDENT'S MESSAGE
by Percy Strong

This will be a challenging year for the society. Most of the executive, if not all, will be retiring from their positions in May. If we are to provide continuity we have to start planning for the succession now. Recruiting people for the various positions is always a difficult task. I am proposing that we set up several committees to oversee the work to be done. Each committee would have the responsibility of making recommendations to the executive and making sure they are carried out.

The committees will make recommendations on programs for the meetings, fund raising, educational programs, the library, membership, and public relations. All of these areas need to be dusted off and evaluated.

To give the committees a place to start, those who attend the first meeting of the year will be receiving a questionnaire. This will be a checkup sheet to find out what the membership thinks should be done this year. The executive rarely gets any feedback on how things are going and this is a chance for you to tell us.

The importance of participation in the committees and the survey cannot be understated. If we are to survive in any meaningful way we need the input and participation of the membership. I will be counting on you to step forward and take an active part.

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DATES FOR APS MEETINGS: please mark your calendars!

Meetings take place in Room B 108, Mount Royal College, at 7:30 p.m.

1991	1992
September 20	January 17
October 18	February 21
November 15	March 20
December 13	April 17
	May 22

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UPCOMING PROGRAMS (tentative at press time)

October 18,1991: Dr. Terry Poulton, Geological Survey in Calgary (ISPG) discusses recent developments in the field of Jurassic ammonites

November 15, 1991: Dr. Beth Mclvor, visiting scientist at the ISPG, discusses flora from the Cypress Hills Ravenscrag Formation (Tertiary).

FIELD TRIP REPORT

by Wayne Braunberger

Three field trips were held this summer: Adanac Mine-Carbondale River, Morrin Bridge, and Moose Mountain. All trips were well attended and had good weather.

Adanac Mine-Carbondale River (June 15)

On this trip, 18-20 members were able to examine exposures of the Fernie, Kootenay, and Blackstone formations. Many outcrops are present in the area, enabling several to be seen in a day, Members met at the Lynx Creek campground, then travelled to the Adanac Mine. Adanac is an abandoned strip mine where coal was mined from the Kootenay Formation in the late 1940s and early 1950s. Along the mine access road and in the excavation, the Fernie and Kootenay can be seen. Plant and invertebrate remains were found. Other stops were made along the main road, the Carbondale River, and Lynx Creek. Although it was cool in the morning, it soon warmed up and an enjoyable day was had.

Morrin Bridge (July 20)

Les Adler reports on this trip to the Red Deer River badlands elsewhere in this Bulletin.

Moose Mountain (August 17)

Nine or ten members met in the parking lot at Canyon Creek and hiked up the Shell road along Moose Dome Creek. After 20 minutes of walking, a scree slope was reached and we climbed up. Collecting was in the well exposed Banff Formation. Numerous invertebrate fossils (brachiopods, corals, echinoderms, and trilobites) were found. For those who attended, this was an enjoyable day.

Some ideas to think about

For the past several years the Society has run the same basic type of trip. It is perhaps time to consider adding some variety. Some ideas to think about are:

Winter field trips: Although we can't go out and collect, there are several museums that could be toured - Royal Tyrrell Museum of Palaeontology, Drumheller and District Dinosaur and Fossil, Glenbow Museum, University of Alberta Geology Museum, and Provincial Museum of Alberta. Special arrangements would have to be made to tour these museums, but I think it would be worth doing.

Summer field trips: At present, we confine ourselves to one and two day trips where everyone is responsible for their own transportation. We should examine trips farther away that would require three or more days. With a longer trip, more remote sites could be visited. The other thing we should consider is the use of vans. This would involve a cost to participants but would be more efficient in transporting people, especially on tour-type trips where several stops are made.

General comments

I would like to remind everyone that at present the Society covers the cost of all field trips. Each field guide costs about $5.00 to produce.

Also, I would like to announce that I will no longer be coordinating field trips for the coming year and will only act in an advisory capacity. Anyone who is interested in coordinating field trips is asked to step forward.

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IN THE NEWS

Calgary Herald, 1 Sept. 1991. Fossil treasures abound.

This article discusses places to explore for fossils in Alberta, and rules for what to do when you find one. The article features a new book by APS member Jacques Leblanc, entitled "Macrofossils: their localities in Alberta," and also gives the APS address as a "contact for information." Congratulations to Jacques on the book's publication - hope to have a review in the next APS Bulletin.

FIELD TRIP 91-2: MORRIN BRIDGE
(July 20)
by Les Adler

By 10:30 a.m., 15 persons including two high school pupils, several college students, and some adults had assembled at the campground just north of the Morrin Bridge, about 145 km northeast of Calgary. A 19-page handout was discussed by Les Adler, the trip resource person. The handout contained references for further reading, tables of formations, notes on river sediments and facies to help a person find likely spots for dinosaur bone deposition, notes on the characteristics of foot and skull bone structures of dinosaurs, and a contour map of the area to be traversed.

The procession of cars and trucks travelled south for about 3 miles and parked at a picnic spot on private property. Everybody climbed up the side of a steep valley, avoiding dangerous holes and cacti, to the top of the badlands (if you try the river route, you risk getting stuck in mud). Les wanted to take the party about 7 km farther south, but because dinosaur bones were found in the first 10 minutes, the party at first wanted to collect there and then.

However, the party climbed down into the valley to the west and reached Les' site about 1:30. It was very hot, and mosquitos attacked exposed flesh; fluids were also soon required. After about an hour, everyone who wanted specimens had material to take back, including one or two *Albertosaurus* teeth and several fragments of hadrosaur vertebrae and leg bones. There was plenty of bone for everyone, and the main problem was to select display material and to get it back to the vehicle. Peter Meyer found amber in a coal seam, but it did not appear to be fossiliferous. There were also many wood fragments, most likely *Metasequoia* sp. People found their own way back safely to the vehicles over steep badlands, and left the picnic area about 5 p.m.

Thanks to Wayne Braunberger for his contribution and for arranging the assembly of the handouts.

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IN THE NEWS

Calgary Herald, dated "sometime this summer."

The bones of *Seismosaurus* were preserved by fluoride compounds that leached from groundwater into the scattered bones. This has allowed remote sensing techniques to be used to survey the site, including ground-penetrating radar.

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Calgary Herald, 24 July 1991, Neighbors p.1. Dinosaur magic - they're back to life.

The article discusses the work of sculptor Brian Cooley, who has been contracted to build 19 scaled-down dinosaurs for an educational movie entitled "Dinosaurs - Messages in Stone," scheduled for October release. Directed by SAlT graduate John Robichaud, the animated film will include location footage from Alberta dinosaur sites.

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Calgary Herald, 25 Aug. 1991. Family gained fame hunting biggest game of all.

This article, reprinted from the Ottawa Citizen, tells the story of Charles H. Sternberg and his sons, who were among the early dinosaur hunters in Alberta.

REVIEWS
from Les Adler

Enigmas of the small shellies, by S.J. Gould. Natural History, Oct. 1990, pp. 6-17.

Gould reviews the information provided in his book "Wonderful Life." Nearly 5/6 of life's history is the story of single-celled organisms, with some amalgamation toward the end of their 3.6 billion year reign. About 650 million years ago came the Ediacara fauna: soft-bodied creatures with anatomical designs strikingly different from all modern animals. Multicellular animals of modern design, with preservable hard parts, first appeared about 550 million years ago in the "Cambrian explosion." It took place in two phases: (1) the Tommotian, named after a Russian locality, which contains a mixture of familiar and decidedly strange fossils, and (2) the Atdabanian, characterized by hard-bodied fossils including trilobites.

This article discusses the latest finds of soft-bodied Cambrian fossils, and their connection to previously found fossils of the Tommotian. Tommotian fossils include sponges, echinoderms, brachiopods, molluscs and the reef-building archaeocyathids. But they also contain tiny spines, plates, cups and caps called the "small shelly fauna." What are they?

In 1989, three Chinese palaeontologists from the Nanking Institute of Geology and Palaeontology published an article (Acta Palaeontologica Sinica, v. 29. pp. 1-16) describing three-inch long specimens from the Chengjiang fauna of south-central China, which is equivalent in age and type of preservation to the Burgess Shale. The animal, *Microdictyon sinicum,* bore 10 pairs of leg-like appendages with caps above each. Also in 1989, 21 specimens of another soft-bodied creature, an articulated halkierid, were found in Peary Land, northern Greenland. These specimens had end-plates similar to the Tommotian type.

Gould views these two creatures as unique, with no known affinity to any other animal. It is not known whether they belong to phyla **outside** of currently known phyla, or whether scientists will eventually classify them **between** known phyla, thus filling in some gaps relating to evolution.

The dragon bones of Tongxin, by Jian Guan with J.A. Rice. Natural History, Sept. 1990, pp. 60-67.

This article describes a Chinese palaeontologist's experiences with the so-called "dragon bones" at the town of Xifeng in Gansu province, 650 miles southwest of Beijing. The crushed bones were being sold in the town pharmacy for medicinal purposes. The palaeontologist learned that the bones came from near the town of Tongxin, 140 miles away, and that local people earned money by mining and selling fossils in the town. From Tongxin, middlemen sold the fossils to drugstores throughout China.

The fossils, which had been mined for about 100 years, were obtained by tunnelling through a mile of sand, clay and gypsum layers. The scientists had to purchase the fossils in order to study them. Over nine years, extinct forms of turtles, deer, rabbits, pigs, bears, rhinos, primates and shovel-tusked mastodons of Miocene age (12-16 million years old) were identified. Two of the mastodons, *Platybelodon* and *Amebelodon,* are illustrated. The animals were probably trapped by flash floods in rivers. Laws have now been passed to ban the selling of fossils for medicinal purposes.

In touch with Walcott, by S.J. Gould. Natural History, July 1990, pp. 10-19.

This article reviews Gould's views of Walcott and adds further material on Walcott not in the book "Wonderful Life." T.H. Clark, Logan Professor of Palaeontology Emeritus at McGill University, who worked with Walcott collecting at the Burgess Shale 66 years previously, gave a lecture disagreeing with some of Gould's interpretations regarding Walcott. Clark gave an antithesis of interpretation for the same basic story that Gould had read as a deep conceptual error, permanently constraining and born of ideological commitments. To Clark, it was a pause in the inexorable progress of scientific knowledge. Clark also reminded Gould about the immensity of Walcott's production of massive multivolumed monographs on fossils and strata, such as a two-volume treatise on Cambrian brachiopods Clark finished with a terrific one-liner: "Walcott's middle name was Doolittle"!

REVIEWS
from Les Adler

Debate: what caused the mass extinction, by W. Alvarez and F. Asaro vs. V.E. Coutillot. Scientific American, Oct. 1990, pp. 76-92.

The first two debators match their comments to the tide, while Coutillot attempts to give a more balanced approach. Alvarez and Asaro concentrate on the Cretaceous-Tertiary (K-T) extinction; Courtillot discusses that one plus seven others during a 250 million year period. Neither set of debators gives prominence to the fact that probably over *95%* of genera may have become extinct at the Permian-Triassic mass extinction. The colourful 2 page illustration concentrates on vertebrates and plants, omitting many other groups that became extinct.

Alvarez and Asaro present an interesting collection of evidence for the K-T mass extinction, such as chemical anomalies, stress in mineral grains, isotopic ratios, and the fossil record. They also quote other workers favourable to their cause, such as Raup and Sepkoski who suggest that mass extinctions occurred at 32 million year intervals. Alvarez and Asaro state that the debate between supporters of different scenarios has become polarized: impact proponents have tended to ignore the Deccan Traps volcanic flows as irrelevant, while volcano backers explain away evidence for impact, suggesting that it is compatible with volcanism. Perhaps eventually the impact thesis and the volcanic antithesis will be synthesized along lines that are at present unclear.

Alvarez and Asaro claim that they are discussing a very short time period for the extinction; Courtillot disagrees. During the late 18th and early 19th centuries, catastrophists (who thought that sudden great events were crucial to the evolution of the planet) lost to the uniformitarians, who explained all life history in terms of gradual change. The theories in this debate support the catastrophist view. If a catastrophe 65 million years ago wiped out over half of the life forms on earth, then survival of the fittest is not the only factor that drives evolution. Species must not only be well adapted, they must also be lucky. Catastrophes also accelerate the rate of evolution. We may owe our existence to the impact that destroyed the dinosaurs, allowing mammals to fill the vacant niches for larger-sized animals.

Courtillot presents evidence from plate tectonics, magnetic field reversals, sets of mass extinctions matched to volcanic flows matched to hot spots, and from fossils to suggest that there is a link between volcanic flows of the Deccan Traps and mass extinctions. He provides a diagram to show that there is a causal relationship between the behaviour of the Earth's core, where the magnetic field is generated, and mass extinctions. Courtillot states that events that at first seem to have been disasters may in fact have been agents essential in the evolution of complex life.

A list of books and articles is provided for further reading.

The mechanical design of insect wings, by R.J. Wootton. Scientific American, Nov. 1990, pp. 114-120.

The author studies evolutionary trends in wing structure and the influence of wing morphology and engineering on flight performance. There are many illustrations, including the fossil wing structures of a 130 million year old cicada from Spain and a much older Australian fossil insect wing. The detailed description of insect aerodynamics concludes that there are similar evolutionary trends in various families of insects that make extensive use of slow, near-hovering flight by beating the wings in a horizontal plane with much twisting. The wings are flexible airfoils, in a sense intermediate between structures and mechanisms, as the terms are understood by engineers.

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IN THE NEWS
Calgary Herald, 18 Aug. 1991. Pond lilies offer clues to dinosaur's extinctions: 20 Aug. 1991. Dinosaurs didn't strike it rich; 25 Aug. 1991. Diamond find won't resolve 'dust-up' over dinosaurs.

The third of these articles discusses the find by Dennis Braman of the Tyrrell and David Carlisle of Environment Canada of tiny diamonds in a Cretaceous-Tertiary boundary clay layer from the Red Deer River Valley.