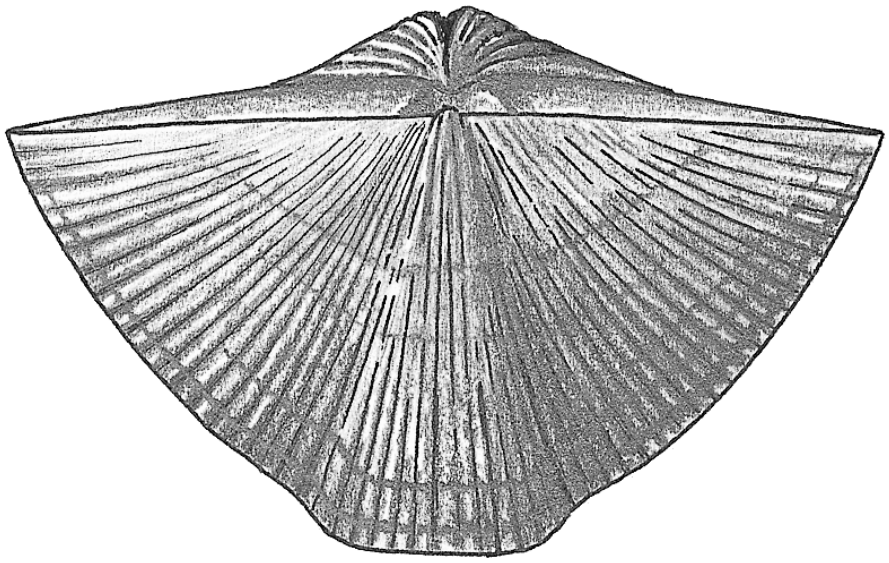
ALBERTA PALAEONTOLOGICAL SOCIETY



THE ALBERTA PALAEONTOLOGICAL SOCIETY

During the Fall of 1983 a small group of friends with a common interest in the study of fossils began meeting on a monthly basis for the purpose of furthering their knowledge in the subject of palaeontology. These meetings, following a general format of slide shows, discussions and demonstrations proved to be so popular that now, three years later, interest is still as strong as ever. With this in mind it was felt that the time was now ripe to initiate proceedings towards the formation of an official Society, the Alberta Palaeontological Society.

At a recent meeting of the group nominations were submitted and an executive committee duly elected; a list of officers appears below. A committee was also established to prepare the official by-laws and regulations.

The objectives of the Alberta Palaeontological Society (APS) are:

1. To develop a working relationship between the professional sector and the amateur.

2. To contribute to the science of palaeontology by

    (a) discovery
    (b) collection
    (c) description, curation and display
    (d) education
    (e) preservation of the natural resources of Alberta

Membership is open to anyone with a sincere interest in the study of fossils.

Meetings are held on the third Friday of the month; for information on venue please contact any member of the Executive. It is hoped field trips will be arranged during the summer months. More information will be available in future issues of the newsletter.

This small newsletter is currently being distributed to private individuals, rock clubs and several professional institutions for the dual purpose of

    (a) promoting the Alberta Palaeontological Society
    (b) inviting any interested individual to submit a written contribution for a future newsletter. It is hoped that a favourable response to this appeal will provide enough material to produce a periodical edition of the newsletter. Future issues will also contain information of forthcoming meetings and programs, field excursions, methods of fossil preparation, book reviews and fossils in the news.

Cheques should be made payable to "Alberta Palaeontological Society" and mailed to

(Mrs.) Steffie Negrich
3011 Hampton Crescent S. W.
Calgary, Alberta
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We welcome your support.

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FOSSILS: FOR SCIENCE OR PROFIT? By: Wayne Braunberger

Recent articles in the Calgary Herald (June 13 and November 30, 1985) and the Alberta Report (December 16, 1985) have chronicled the plight of Mr. Rene Vandervelde, President of Korite Minerals Ltd. Mr. Vandervelde has the problem of not being able to get fair market value for his fossils from Canadian museums and universities, thus he has taken his wares south of the border to Tucson, Arizona to obtain an assessment of their market value, as well as to make some sales.

Mr. Vandervelde's plight has been made public by his arrests and convictions under the Federal Cultural Property Act and the Alberta Historical Resources Act for exporting fossils without the proper permits. He has been fined under the Alberta Act for illegally exporting Cretaceous ammonites and in November of 1985 he was fined under the Cultural Property Act for exporting a Triassic squid from the Wapiti Lake area of British Columbia. The squid was eventually sold to the Tyrrell Museum of Palaeontology The fines received in each case were not very large and only improved Mr. Vandervelde's investment. The Cultural Property Act regulates fossil prices on the basis of their proven market value. By taking the fossils to Tucson, a market value was established and he can now quote higher prices for his material. Mr. Vandervelde is the most public and well-known of the fossils for profit group. Although he is the obvious example of this activity, there are no doubt others who engage in the same activities.

Fossils are the remains of animals long since perished from the face of the earth. They are, all things considered, very rare and hard to find. Many are unique, one of a kind, and thus are of great value to science. It is also this rareness which in some circles creates a monetary value for them. There exists a large and ready market for the rare and unique specimens. Many of these specimens leave Canada never to return. Some end up in foreign museums and universities, many in private collections never to be seen again.

Many people see fossils as a source of revenue and only regard the scientific value as a means to increase the price. In the near future because of this activity I foresee many problems for the reputable amateur collector. Professionals are becoming increasingly frustrated by the rare and unique specimens that are being ferreted out of the country. To a professional it would be very disheartening to learn of a rare fossil discovered in your backyard that you were unaware of which now resides in a foreign country. One possible solution that is rumoured is the total ban of all collecting in Alberta except by permit holders (permits would only be granted to professionals associated with reputable scientific institutions) with heavy fines, etc. for offenders. This approach (the sledgehammer solution) is, I feel, inappropriate as it would only serve to force collectors underground and create even more problems.

I would propose that the partial solution to the problem would be for the professionals and the amateurs to work closely together. There are more amateur collectors than professionals and the amateurs cover a wide variety of locations and geological time. The amateur can be an excellent source of new locations and in many cases in the past it has been the amateur who has made the "big find", not the professional. The knowledgeable amateur can be of great assistance in increasing the rarity and diversity of fossils found. Most if not all amateurs would welcome the opportunity to work hand in hand with the professional palaeontologist.

It is the misguided entrepreneurs, such as Mr. Vandervelde, who have given the amateur a bad name, and have in fact done a great disservice to Canadian palaeontology by being only out to line their own pockets with a callous disregard for science. In the early part of this century many of the most spectacular fossils were lost to the United States and other countries. Must a great many other fossils go too? I say no! Under the existing Federal and Alberta laws fossils can still be exported but the fines for illegal activities are so low that they have no deterrent on the exporter. I believe that the export of fossils should be allowed but only under very controlled circumstances. Any private individual who wishes to export should have his specimens inspected by a professional palaeontologist, any unique or rare specimens should not be allowed to leave. The fines for illegal activity should be so high as to provide an adequate deterrent, in other words a $500 fine for exporting a $12,000 fossil is not a deterrent, but a $25,000 fine would be. The loss is greater than the gain.

Fossils belong to the people of the country and should be kept here. With more public awareness and education perhaps our natural history may be kept in Canada, and one would not have to travel to a foreign country to view Canadian fossils. I enjoy collecting and can think of no greater thrill than that of finding a never before seen specimen and having it displayed in a museum and perhaps even having it named after me. Fossils should be collected to increase our scientific knowledge and understanding of the past. Fossils for profit only create problems and distract from the quest for knowledge.

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LABELLING FOSSILS By: Les Adler

Many people when they find a fossil, clean it, admire it, enjoy it, then place it in a box in a drawer and forget it until the next season. One fine day they open the drawer, see the fossil and ask, "Where did this come from?" If no record has been made, it is quite likely that no one will be able to pinpoint the location from where the fossil originated.

As fossils become harder to find due to the fact that there are more people collecting than formerly and also that many of the easy locations have been depleted, it becomes more likely that fossils in your collection will be of use to museums, geological surveys or educational institutions. When you pass on, your beneficiary may decide to donate your specimens to one of these buildings. To help these institutions and also to encourage you to be a little more unselfish I am suggesting that you look at the card that I have provided to go with each fossil and that you read the following:

After trimming, cleaning or treating a fossil you can help yourself and others by recording somewhere a catalog number, a name, (even a temporary guess), a location (preferably a technical survey location from a map stating range, township and section), the name of the finder (or donor), and the date the fossil was found.

The catalog number can go with the specimen name which is sometimes the genus and species, and sometimes more general such as "fragment of leg bone of carnivorous dinosaur". (I don't have room to store a complete dinosaur).

This card was designed by a printer after I explained my requirements.

SPECIMEN NAME:
PHYLUM:
CLASS:
ORDER:
FAMILY:
GENUS:
SPECIES:
AUTHOR:
FORMATION:
PERIOD, EPOCH OR STAGE:
ERA:
LOCALITY:
COLLECTOR: DATE

It is not necessary to fill in every space, but if you are able to do so, the specimen will then be of use to a scientist as well as encouraging you to learn about the environment when the organism was alive, where the organism fits in during the Earth's four billion years of existence and whether descendants of the organism have come through time.

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BLASTOIDS By: Geoff Barrett

Most people at some time in their lives have strolled along a beach and peered with curiosity into the world of the rock pool. Many, therefore, are familiar with the spiny sea-urchin and the ubiquitous starfish often encountered in such an environment. These two animals make up part of a large phylum, the Echinodermata (spiny-skinned).

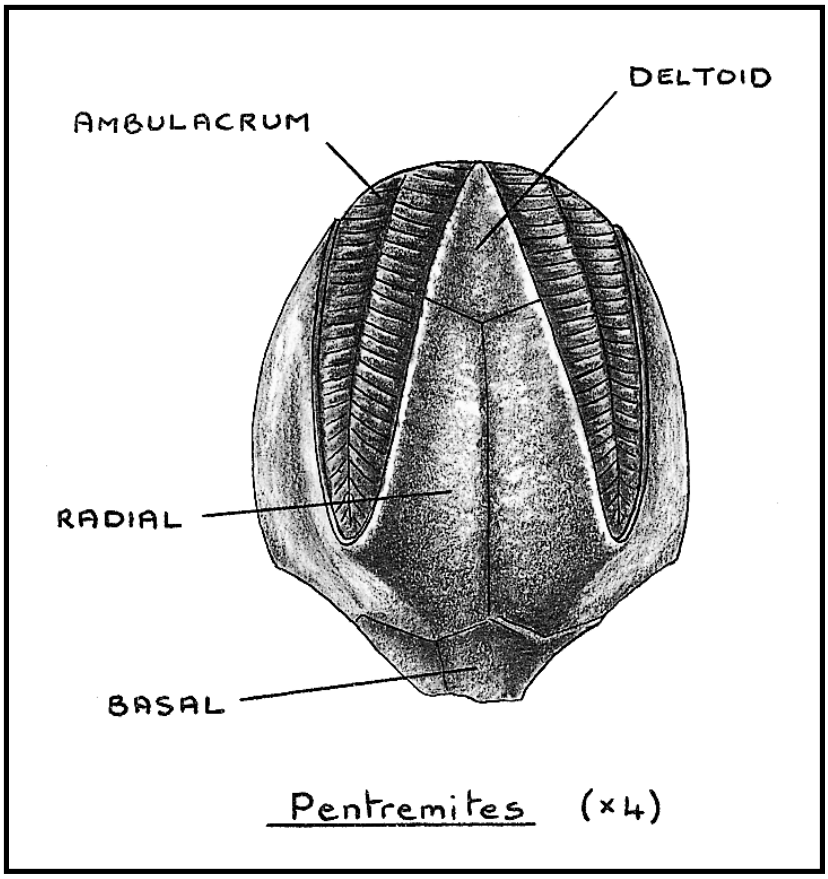
The phylum Echinodermata comprises several classes, the most common living representatives being:-

Class Echinoidea - the common sea-urchin
Class Stelleroidea (sea stars) - includes the sub-class Asteroidea or common starfish
Class Crinoidea - the 'sea-lilies', so called for their lily-like appearance, although actually a marine animal.

There are also several classes of the Echinodermata that are now extinct and known only from the fossil record. Included in this category is the Class Blastoidea, worthy of mention because of the large numbers of well-preserved specimens that may be found to the west of Calgary.

The amateur collector need only be concerned with the more easily recognizable external features, so for the purposes of this short article all internal and the less obvious external features will be omitted.

One of the most common blastoids was Pentremites (see insert) which displayed a great diversity of size and form. Well-preserved specimens of Pentremites along with several other genera, occur locally in the Banff Formation of Canyon Creek, to the west of Calgary.



The blastoids (bud-like) were small, primitive echinoderms, usually possessing a short stem which was anchored by means of a root-like extension, although some genera were stemless.

The head (calyx) of the blastoid is made up of 13 plates arranged in three radial rings. At the base are three plates, the basals, above which are five forked plates known as radials. Immediately above, and interlocking with the radials, are five smaller plates, the deltoids.

The calyx exhibits striking pentameral symmetry, the five deeply grooved ambulacra being the most prominent feature. The blastoids lacked the branching arms of the crinoid, possessing instead short appendages called brachioles (usually not preserved) arising from the ambulacra, which served as a food gathering mechanism.

In the case of Pentremites the mouth was situated at the apex of the calyx and was surrounded by five openings (spiracles) through which circulating internal water was exhausted. The anus was fused with one of these spiracles.

The blastoids are first found in rocks of Ordovician age and survived until late Permian, being most prolific during the Carboniferous period.

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The following article by Donald J. Sabo and Wayne F. Braunberger originally appeared in the Summer 1984, Volume 3, No. 2 Edition of "Fossils Quarterly".

COLLECTING VERTEBRATE MICROFAUNA FOSSILS FROM THE JUDITH RIVER (OLDMAN) FORMATION OF SOUTHERN ALBERTA, CANADA

INTRODUCTION:

Located amongst the windswept prairies of southern Alberta where the occasional herd of pronghorn antelope can be found grazing, is an area which suddenly drops 110 meters from the prairie top to the Red Deer River below. Referred to as the Badlands, with deeply eroded gullies and steep bluffs, exposing horizontal and cross-bedded layers of sandstone, shale, clay, and ironstone, giving a dramatic landscape. Inhabited by mule deer, cottontail rabbits, and the occasional rattlesnake, this area has become world renown for its richness of dinosaur fauna. Situated 234 km East of Calgary, Alberta, a 34 sq. km section of these badlands are included in the famed Dinosaur Provincial Park, which in 1979 was named a World Heritage Site by UNESCO.

The vertebrate fossils from the Park and surrounding area come from the Judith River (Oldman) formation of the Upper Cretaceous (Campanian) time period deposited some 76 million years ago. Although the Park contains the richest accumulation of fossils, areas surrounding the Park are found to also contain dinosaurian material and isolated accumulations of vertebrate microfauna.

Microfauna accumulations are the apparent hydraulic or biological concentrations of the most resistant remains (teeth, scales, plates, and vertebrae) of small vertebrates (average bone size about 11 mm). Microfaunas are important because they sample the elusive small component of the vertebrate fauna. Included in these accumulations are dinosaurian material consisting of teeth, centra of juveniles, small toe bones, and dermal ossifications (Dodson, 1983).

GEOLOGY:

The Judith River (Oldman) deposits in the area of the Park were deposited by a non-marine fluvial environment of meandering and braided streams whose channels migrated north and south over a flat alluvial plain 360 km east of the rising Rocky Mountains. Some 105 km to the northeast lay the nearest arm of the sea, a bay between two large deltas (Russell, 1977). This Gulfian embayment was about 800 km wide along the forty-ninth Parallel.

Small vertebrates, invertebrates, and plants all suggest freshwater conditions, however, the abundance of such euryhaline fishes as gars (Lepisosteus), sturgeons (Acipenser), and batoid (Myledaphus) suggests that the rivers passed directly into the sea (Dodson, 1983).

The Judith River (Oldman) sediments are composed of sandstones, siltstones, mudstones, carbonaceous shales, and ironstones. Cross-bedded grey sandstones deposited in the stream channels make up the majority of the deposits. Most fossil material is usually found at the base of these stream channels.

The climate at this time was tropical from the evidence given by pollen studies (Jarzen, 1982) and seasonal as demonstrated by annual growth rings in wood, teeth, and certain reptile vertebrae.

MATERIAL COLLECTED:

At most microfauna sites we have found the remains from a wide variety of vertebrates. These are usually teeth, scales, plates, vertebrae, dermal scutes, and small bones from fish, shark, turtle, champsosaur, crocodile, lizard, amphibian, dinosaur and on the rare occasion mammal.

Remains from the two most common fish found are small hexagonal teeth of the ray-like Myledaphus, and diamond shaped enamelled scales and centra of the garpike Lepisosteus Less commonly found are the vertebrae from the amiids, dorsal spines and bony body plates of the sturgeon Acipenser, slender jaw fragments of the holostean Belonostomus and button-like teeth from the albulid Paralbula. Teeth from estuarine sharks are rarely found. Carapace fragments usually from Aspideretes and Basilemys make up the bulk of the turtle remains we find, along with the occasional toe bone and claw. Spool-shaped centra of Champsosaurus are commonly found as well as the curved cone shaped teeth and rectangular pitted dermal scutes from the crocodile Leidyosuchus Centra from the large lizard Paleosaniwa are occasionally found. Frog remains are scarce, and sections of the humerus are all that we have found. Salamander jaw fragments and centra from Scapherpeton, Lisserpeton, and Prodesmodon have been found on occasion.

Microfauna sites also contain numerous dinosaurian material such as teeth, small vertebrae, small toe bones, dermal scutes, and ossified tendons from the Hadrosaurs, Ceratopsians, Ankylosaurs, Pachycephalosaurs, Coelurosaurs, Ornithomimids, and Tyrannosaurs.

We have found only one mammal tooth from our numerous forages into this area, and take this as a sign that these remains are indeed very rare.

COLLECTING:

To find a microfauna site takes a lot of hard looking and climbing, along with a little luck. There is no real criteria to go on for finding one of these sites, but we have found that where a horizontal bed of sandstone contains a thin layer of clay pebbles along with a concentration of isolated small dinosaur bone, it can sometimes be a good place for microfauna material.

No excavating is required because the fossils we collect have already been weathered out of the rock and for the most part lay loose on the surface. With these fossils being so small, ranging in size from one or two millimeters up to about eight centimeters, collecting has to be done on your hands and knees and sometimes flat out on your belly with your nose just about dragging on the ground. A small dental pick for prying out the few fossils that may still be partially in the rock, newspaper or toilet paper for wrapping the more fragile specimens in, and a bag for packing what you find in, are about all the materials you need when collecting microfauna

For the most part no real special handling is required because of their small size, and they are usually found in fairly good condition and not badly eroded, though some do show rounding from being tumbled in the ancient streams before they were finally deposited. Professionals studying microfauna sites within

the Park use various sieving techniques to obtain a greater number of these small fossils than just surface pickings can.

When collecting in the Badlands during the summer, conditions can range from scorching temperatures of up to 40° C to sudden thunderstorms and very muddy and slippery conditions. With no fresh water supply in the area, plenty of water has to be packed along for the extreme temperatures. Many prickly pear cactus are found which sometimes can be hazardous to the hands and knees if you are not careful as you crawl along collecting. A run-in with the occasional rattlesnake can usually increase a person's heart rate.

SUMMARY:

Collecting microfauna is a rewarding experience and collecting in the Badlands is very unique and exciting. They are more of a challenge to collect than larger material and a more diverse amount of material can be found in a small area. Although not as spectacular to find as a large bone would be, microfauna are easier to collect and, we feel, more interesting to study.

Studies by professionals over the last few years within the Park on microfauna sites are helping to interpret local environments which occur in the Judith River (Oldman) formation, to determine the overall paleoecology. Due to the renewed interest in this area, a relatively clear picture of what it was like to live during the time of the dinosaurs may emerge.

We enjoy collecting and hope to make our own contributions to the understanding of this period of time.

REFERENCES:

Currie, P. J.1981. Hunting Dinosaurs in Alberta's Great Bonebed Canadian Geographer. 101(4) :34-39

Dodson, P. 1983. A Faunal Review of the Judith River (Oldman) Formation, Dinosaur Provincial Park, Alberta. The Mosasaur 1:89-110

_____1971. Sedimentology and Taphonomy of the Oldman Formation (Campanian), Dinosaur Provincial Park, Alberta (Canada). Paleogeography, Paleoclimatology, Paleoecology. 10:21-70

Ferguson, T. 1983. Where Dinosaurs Roamed: Hunting for Clues in Alberta's Ancient Cemetery. The Review. 2:21-24

Jarzen, D. M. 1982. Palynology of Dinosaur Provincial Park (Campanian) Alberta. Syllogeus. 38:1-69

Johnson, H. and Storer, J. E. 1974. A Guide to Alberta Vertebrate Fossils from the Age of Dinosaurs. Edmonton, Provincial Museum of Alberta. 1-117

Russell, D. A. 1977. A Vanished World: The Dinosaurs of Western Canada, Ottawa, National Museums of Canada. 37-64

We thank Lyle Hartwig for contributing the following article.

Here are some thoughts on the subject of Geology by the late Murray Pease.

Mr. Pease, in his active life, was a Chemist and head of the Research Laboratory of the Metropolitan Museum of New York. He was a gentle and witty character.

This 'exposition on geology' was discovered among his papers, eventually finding its way into the records of the meetings of the International Institute for the preservation of Historic and Artistic Works - American Group.

"Geology is mostly about rocks. There are three main kinds of rocks, Ignominious, Sedentary and Metaphoric. Ignominious rocks can be taken for granite, Sedentary rocks are mostly chalk, which comes in cliffs or in small round sticks, and Sandstone, about which the less said the better. Metaphoric rocks are more interesting. One kind is marble, which comes in little round balls, flat slabs and shapes that look like naked people without arms, which are kept in museums. Another kind is slate, which is for Geologists to write on with chalk. The only other kind worth mentioning is Steatite, or Soapstone, which is found in the shape of ashtrays or old-fashioned kitchen sinks."

"Stones come in a lot of different periods. These were invented by Geologists, who have to have something to do, and they are the only ones who can remember which is which. The only one I can remember is the Plasticene Period, which is when man first learned how to model and got oil stains on his rompers."

"You have to sort of get used to Geologists. At first they seem to have nothing but rocks in their heads, and when they talk about beds they don't mean what you think. But underneath they are almost normal. When they go on a field trip with their little hammers, they sit around evening fires on their terminal moraines and sing just like anybody else, songs like..... "Lava, come back to me, Shale be cambrian round the mountain when she comes, Fossil I do when you are far away?, You'd be so gneiss to come home to, When the chalk is on the greensands I'll be Huronian back to you in my red marl".

"When you meet a Geologist, be nice to him. He may be somebody's mammal."

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