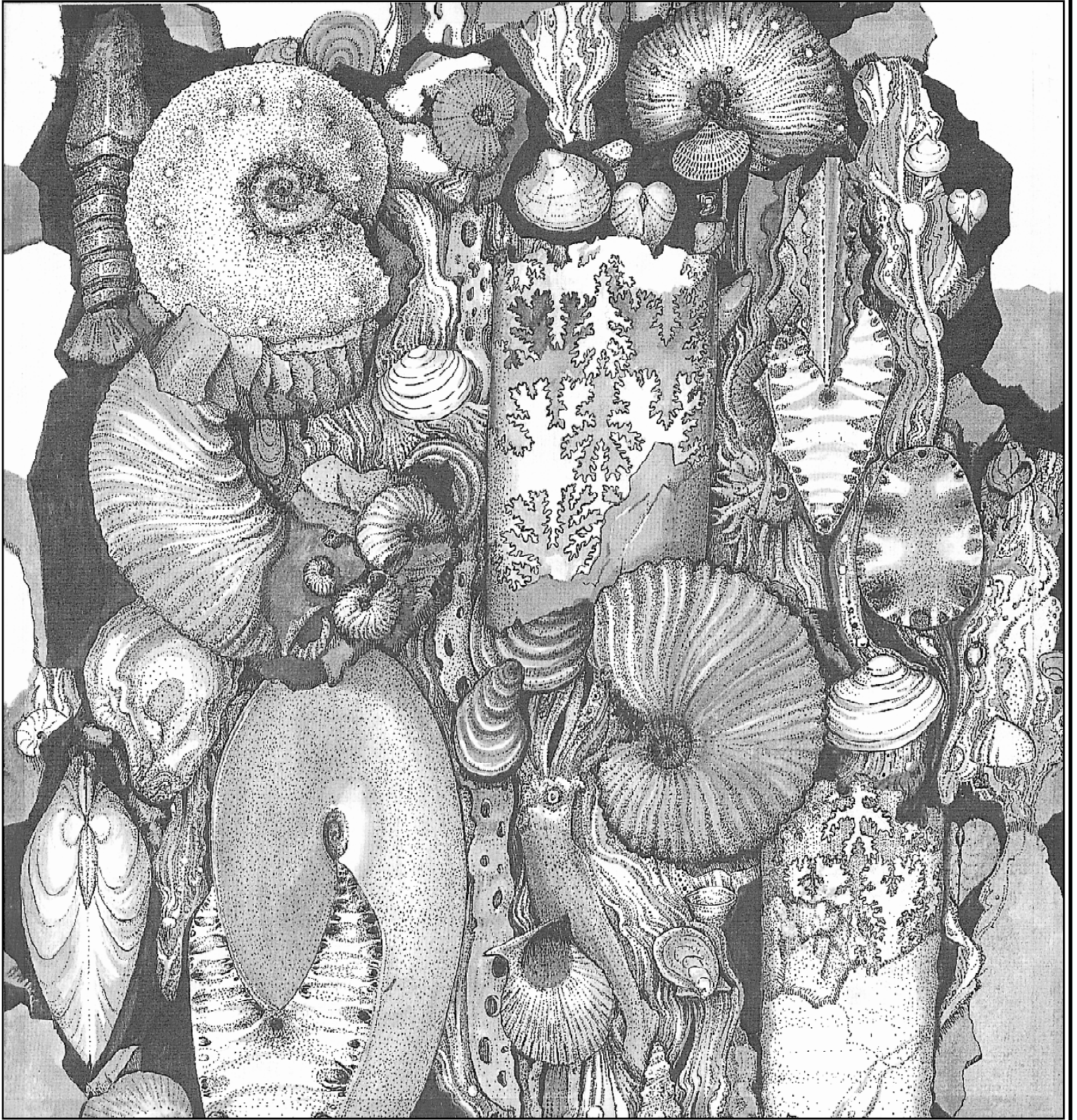


ALBERTA • PALAEOONTOLOGICAL • SOCIETY

# BULLETIN

VOLUME 7 NUMBER 1

MARCH 1992



## ALBERTA PALAEOLOGICAL SOCIETY

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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 palaeontological 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

Memberships expire December 31, 1992 Annual dues for 1993 are payable by January 15, 1993. Dues not received by the March 19, 1993 general meeting will result in cancellation of membership.

**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.

Mailing Address:

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Requests for missing issues of the Bulletin should be addressed to the editor.

**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. Except for articles marked "copyright ©," reprinting of articles by exchange bulletins is permitted, as long as appropriate credit is given.

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## DATES FOR APS MEETINGS

Meetings take place in Room **B108**, Mount Royal College, at **7:30** p.m.

**1992:** March 20\*, April 24, May 22\*

\*Bulletins will be distributed to members in attendance.

**Please note that the date of the April meeting has been changed from April 17, due to Good Friday**

\*\*\*\*\*

**ON THE COVER:** This issue's cover illustration, a montage of Bearpaw Formation marine fossils (Late Cretaceous), is by APS member Hope Johnson, LLD, of Redcliff, Alberta. See page 9 for more details. (Reproduced by permission.)

## PRESIDENT'S MESSAGE

by Percy Strong

The month of May means the induction of a new executive. After three years in the president's chair, I have indicated that I won't be standing for reelection. There will be several other positions (Vice-President, Secretary, Programmes/education) open on the executive that need to be filled to insure the society's survival.

I feel that the upcoming year is important for the club if we are to continue in any form. We made an important step when we moved from meeting in basements to Mount Royal College. Now is the time for us to work harder at expanding our membership again. This would enable us to draw on a greater pool of people to run the club.

Another important step for the club is to move from the philosophy that "a few will do all". Members of the executive must routinely be replaced and continuously train others to fill in for them. This will enable an easier transition for incoming executive members. This should be complemented by forming committees to support each of the directorships. For example, if the Programmes/Education director had two others helping him/her it would be a lot easier to organize and run a series of educational courses.

I would like to thank the members of the executive who have helped run the society over the last three years and wish those who are staying on all the best.

## FROM THE EDITOR

by Howard Allen

At a recent directors' meeting it was noted that the *Bulletin* is one of the more important and popular benefits of membership in the Society (an obvious conclusion for our out-of-town members) and as such, more effort and resources should be concentrated in this area. To this end I have tried to begin, with the first issue of 1992, what I hope will be an ongoing "toning-up" of the *Bulletin*. With cooperation from the membership, I hope to be able to present more original material, in the form of both articles and artwork.

Before I go any further, I would like to thank our past editor, Heather Whitehead, for

her advice and guidance, which greatly helped in making the transfer of editorship a smooth one (so far!). Heather also deserves thanks for starting the most recent improvement in the *Bulletin* by retiring the Society's typewriter.

This is the first issue for which I can be held wholly responsible. All comments, including advice, criticism, scorn and derision are welcome (especially in the form of letters to the editor!)

One resource I inherited from Heather was a collection of all the past issues of the *Bulletin*. Sitting in bed one night perusing this archive, I was struck by the number of excellent articles which appeared in the early issues. Articles on blastoids, trilobites, conularids and fossil fishes; articles on preparing and labelling; articles on collecting microvertebrate fossils. Later issues gradually became thinner and tended to concentrate on clippings and items from newspapers and other journals. One or two regular contributors seemed to supply most of the articles. If you were to remove the news items and president's message from several of the later bulletins, you would be left with a journal that could be renamed *Les and Howie's Quarterly Review*.

A common remark from members might be "well... I don't have anything to write about." Really? If you applied this sentiment to the last three articles yours truly submitted, what got published was: "something about tweezers; a crummy, beat-up clam; and a blurb about parts from dead fishes." Yawn. Parts is parts. Are fossils really that boring? I don't think so, and I know you don't think so.

If I was able to scrape up three articles for almost as many issues, based on odds and ends from my small collection, I'm sure someone else out there must have *something* to write about! In order to "prime the pump" and practice what I preach, I will, starting with the next issue, begin a regular column dedicated to fossils on a microscopic scale.

I hope you will join me in making the *Bulletin* as spectacular on the inside as Hope Johnson has made this issue on the outside.

Finally, a couple of notes: First, please be aware (page 1) of the Society's new mailing address. Second, the expiry date of your membership is now printed on the mailing label affixed to your bulletin. For example, **Dec92** means expiry on Dec. 31, 1992.

## PROGRAM SUMMARIES

October 18, 1991; Dr. Terry Poulton, Institute of Sedimentary and Petroleum Geology, Calgary: *Jurassic Ammonites, their Importance and New Developments.*

Ammonites range from the early Devonian to the late Cretaceous. In Jurassic sequences ammonites are very useful for dating, defining fossil provinces and determining depositional environments. The Jurassic has 76 ammonite zones which can be divided into numerous subzones representing about 120,000 years each. This is the best zonation for any of the time periods and makes the ammonites the correlation “tool of choice” in the Jurassic.

There are three main groups of Jurassic ammonites. They are: the phylloceratina, the lytoceratina, and the ammonitina, which is the most prominent and most studied of the three.

The study of Jurassic ammonites is hampered by two main problems. The first, *homeomorphy*, refers to similarity in shape amongst several different species. This common problem is often resolved by close examination of the suture lines and by the use of faunal associations. The other main problem is *polymorphism*. Polymorphism is the range of variation in shape that can be assigned to a particular species.

Terry’s work has taken him from the Queen Charlotte Islands to Spitzbergen in the Arctic Ocean north of Norway. His work in the Yukon helped identify the original edge of the North American continent before most of Alaska “docked” in the Cretaceous. His studies in the Queen Charlottes helped define the base of the Upper Jurassic.

In central British Columbia, his studies of a copper-bearing submarine volcanic assemblage helped mining companies pinpoint areas for optimal exploration. His work revealed that there were actually two volcanic units present—one mineralized, the other not. By identifying the ammonite assemblages geologists were able to pinpoint producing trends much faster.

The work in central British Columbia also revealed that the terranes which make up B.C. as we know it today, were in place by the mid Jurassic. The ammonite assemblages found in the mid Jurassic of the Bowser Basin show a

mixing of the eastern and western faunal provinces not evident in older Jurassic rocks.

This was our first talk on ammonites for quite some time. Judging from the interest shown by the membership, it was long overdue.

– Percy G. Strong

February 21, 1992; Dr. Brian S. Norford, Geological Survey of Canada, Calgary: *Progress of the International Working Group on the Cambrian-Ordovician Boundary.*

Geological time boundaries are arbitrarily chosen on the basis of distinctive and easily recognizable events in earth history. To prevent confusion and arguments over the dating of rocks and fossils, consensus must be reached among earth scientists the world over, on exactly where in time the boundary is situated, and how to distinguish it where it occurs.

Dr. Norford detailed the work of the *International Working Group on the Cambrian Ordovician Boundary*, a group of scientists formed in 1974 to study the problem of defining the Cambrian-Ordovician boundary and to select a particular outcrop or ‘stratotype’ which best documents conditions occurring at that time in earth’s history.

Many criteria must be considered in the selection of a stratotype. Just a few include:

- Quality and completeness of the outcrop—are the rocks badly weathered or overgrown? How much rock is exposed and available for sampling and study?
- Continuity of sedimentation—if there are gaps in the rock sequence caused by periodic breaks in deposition, or by short periods of erosion, the record will be incomplete.
- Abundance and diversity of fossils—if fossils are scarce, or of a few local types, correlation with other rocks around the world may be difficult or impossible. Ideally, the outcrop should have cosmopolitan faunas of several types with short, distinct age ranges.
- Are other, non-biological markers present? Ash beds and paleomagnetism may be useful for absolute dating and correlation.
- Physical, political and pecuniary factors also apply—is the outcrop located in a country subject to war or harsh travel restrictions?

Is the outcrop easy to get to? A stratotype on a peak 200km from the south pole would be both difficult and expensive to study.

- Can the outcrop be afforded legal protection? A formal stratotype must be guarded from uncontrolled collecting and vandalism. Is a developer likely to bulldoze the outcrop in a few years and build condos?

After many trips to likely outcrops around the world and meetings in which members of the group discussed, argued and voted on the merits of each, two sections have made the 'short list' of potential stratotypes: Green Point in Newfoundland, and Dayangcha in China.

Work is ongoing. Uncertainty about the ranges of critical conodont species and questions about the stratigraphic completeness of the Newfoundland section mean that further studies will be required before a stratotype is finally agreed upon.

– Howard Allen

## FIELD TRIPS 1992

Three field trips are planned for this summer; all dates may be considered **firm**. Details on access to some sites is still being finalized; in case any problems arise, several alternate locales are available—watch for updates in the next *Bulletin*.

### TRIP 92-1: June 20–21, 1992 Ravenscrag Butte, Saskatchewan

Well-preserved Early Paleocene plant fossils occur in the Ravenscrag Formation at this locality in southwestern Saskatchewan.

### TRIP 92-2: July 18, 1992 Scabby Butte, Alberta

Site of one of the earliest dinosaur discoveries in western Canada, a wide variety of vertebrate fossils, including various fish teeth, crocodile and turtle remains and dinosaur bones and teeth have been recovered from this isolated exposure of the St. Mary River Formation (Maastrichtian) north of Lethbridge, Alberta.

### TRIP 92-3: August 15, 1992 Huxley, Alberta

A magnificent specimen of the Tyrannosaur *Dynamosaurus imperiosus* (on display at the

Royal Tyrrell Museum of Palaeontology) was excavated from the Upper Cretaceous Scollard Formation at this locality in the Red Deer River badlands. Northeast of Three Hills, Alberta, this site also has an important exposure of the Cretaceous/Tertiary boundary.

As in previous years, you are advised that most of these visits may involve a fair amount of walking and/or scrambling over hot, dry terrain: bring proper footwear, hats, sunscreen, lunch, and lots of water (in order to guarantee a nice day, bring lots of rain-gear as well!).

For more information, contact Les Fazekas at 248-7245.

## In Memoriam

We are saddened to report the recent death of one of our members, **Mr. Lawrence Devern Halmrast** at the age of 66, in Milk River, Alberta on Friday, February 7th 1992.

Lawrence was well known to many members as having one of the largest and most important private collections in Alberta. Thanks to his unbounded enthusiasm and generosity, specimens from his collection have found their way into museums around the world.

The following remarks are from the *Lethbridge Herald*, Feb. 8, 1992:

Lawrence grew up on the family farm in Warner and it was here picking rocks from the field that he first became interested in archaeology, and later, paleontology. As he learned about these subjects he would freely share his knowledge with anyone who asked...

Lawrence has been honored and recognized by many organizations. His love of life along with his desire to always learn more and help others led him to volunteer his many talents and many hours. The highlights of his life were receiving the Big Horn Award and receiving an Honorary Doctor of Laws degree conferred upon him by the University of Lethbridge. He was most deserving of both...

Donations may be given to the Warner Memorial Library or the Canadian Cancer Society, Lethbridge.

## FOSSILS IN THE NEWS

*The Globe and Mail*, Oct. 9, 1991:

### **Don't disturb the dinosaurs**

Brian R. Pratt, of the University of Saskatchewan, makes a plea for the protection of Canada's fossil resources in this letter to the editor. In response to an article by *Globe* writer Alan Freeman, wherein provincial regulations governing the removal of fossils are cited as a "bizarre barrier" to trade, Mr. Pratt notes that "indiscriminate looting by amateur collectors or greedy fossil vendors can easily decimate [sites such as the Burgess Shale and the Conception Group of Newfoundland] and cause irreplaceable loss to knowledge."

*The Vancouver Sun*, Oct. 11, 1991:

### **Missing-link fish faces extinction, expert claims**

Guelph, Ont. (CP)—The 'living fossil' fish, the coelacanth (*Latimeria chalumnae*), may soon be a real fossil, according to this article. Eugene Balon of the University of Guelph claims that the remaining population (about 200) which lives in the Indian Ocean off Africa, is threatened by an Asian myth that the coelacanth's spinal fluid is an 'elixir of life.' As well, increased interest in (presumably scientific) testing is threatening the fish. The Coelacanth Conservation Council is asking for World Wildlife Fund protection for the fish.

*The Province* (Vancouver), Oct. 17, 1991:

### **90m-year-old skeleton found**

Saskatoon (CP)—Report on the discovery of a plesiosaur in the Carrot River area, northeast of Saskatoon. Tim Tokaryk of the Museum of Natural History (Regina) describes the find as "...a marine reptile which could be 30 to 40 feet long..." Excavation was to commence immediately. [in an *As It Happens* (CBC Radio) interview some days later, Tokaryk revealed that the find was, in fact, a large crocodile —*ed.*]

*Alberta Report*, Dec. 2, 1991

### **Busting the bone hunters—Dinosaur rustlers threaten Alberta's rich graveyards**

The ongoing dinosaur craze is threatening fossil resources throughout North America. Though most severe in the United States, the

problem affects Canadian sites as well:

- A few years ago, an Alberta man was fined for stealing a crocodile skull from Dinosaur Provincial Park.
- Last spring, a Royal Tyrrell Museum of Palaeontology dig near Medicine Hat was raided during the night: important hadrosaur material was lost.
- An Alberta school teacher was charged with possession of a dinosaur leg bone stolen from a Drumheller fossil shop.

Dennis Braman of the Tyrrell Museum is quoted: "As long as there is a buck to be made, and increasingly there is, some people are going to steal away this resource."

*Calgary Herald*, Dec. 21, 1991:

### **The Bone Rustlers—Dinosaur collectors fuel Bone Rush as outlaws in pickups jump academics' claims**

With dino skeletons fetching \$500,000 US, incidents of bone rustling—including night-time raids—from scientific fossil digs are increasing. "At least 50 commercial companies and many more roving bands" are scouring the western US for dinosaur bones. Palaeontologists are worried that important specimens are being lost to "Japanese and West European collectors [with] deep pockets." The article claims that, by contrast, Alberta's "tough laws keep bone rustlers at bay..." [contrast this last claim with the preceding article...—*ed.*]

*The Edmonton Journal*, Jan. 13, 1992:

### **Mastodon bones may be 100,000 years old**

Milford, N.S. (Southam News)—The article documents the find of a (probably) complete skeleton in a Nova Scotia gypsum mine. Besides the mastodon, geologists from the Nova Scotia Museum have recovered freshwater clams, extinct snails, a tree limb gnawed by a prehistoric beaver, and "a nice little flat frog."

In a scenario reminiscent of southern Alberta's recent *mêlée* over dinosaur eggs, a skirmish has erupted between two small towns in the vicinity of the mastodon find, over bragging rights and potential T-shirt sales.

*MAPS Digest*, October 1991, pg. 3

### **BLM Legislation Update**

For readers interested in the simmering debate over the status of fossil collecting in United States Bureau of Land Management (BLM) and US Forest Service lands (see *Bulletin*, March 1991), several updates on the situation have appeared in the Middle-America Paleontological Society's *MAPS Digest* under the byline of John Boland, MAPS member.

Changes to BLM legislation that would have allowed amateurs to collect a wider variety of fossils on federal lands were stalled, primarily by professional palaeontologists, who feared a lack of control over private and commercial exploitation of important fossil resources.

As of May 31, 1991, no agreement had been reached, and legislation remained under review. In the meantime, "the BLM will continue the current practice of allowing recreational collecting of common invertebrate fossils and petrified wood. Collection of vertebrate fossils will continue to require a permit... Commercial collecting will not be authorized at any time."

*Geotimes*, April, 1991, pp.18–21

### **The Sino/Canadian Dinosaur Expeditions 1986–1990**

This short article by Philip J. Currie, of the Royal Tyrrell Museum of Palaeontology, documents some of the important finds during five years of field work, in both China and Canada. A multi-disciplinary team of Chinese and Canadian palaeontologists and geologists discovered much new and important material, from middle and upper Jurassic (China), lower Cretaceous (China, Alberta, Canadian arctic), and upper Cretaceous (China, Alberta, arctic) formations. Research on the recovered material is ongoing, and scientific results will be published in the *Canadian Journal of Earth Sciences*, commencing in 1992. Some of the specimens will be seen in a travelling ExTerra Foundation exhibition.

*Canadian Journal of Earth Sciences*, 1991  
**Paleontology and Biostratigraphy**

Some papers published in this technical journal during 1991 (Vol. 28), that may be of

interest to members include:

**Dinosaur footprints with skin impressions from the Cretaceous of Alberta and Colorado** by P.J. Currie, G.C. Nadon, and M.G. Lockley; No. 1 (January), pp. 102–115.

**Foraminifera of the middle to upper Albian transition (Lower Cretaceous), northeastern British Columbia**, by C.R. Stelck; No. 4 (April), pp. 561–580.

**Stratigraphy and graptolites of the Upper Ordovician Point Leamington Formation, central Newfoundland**, by S.H. Williams; No. 4 (April), pp. 581–600.

**Cyanobacterial-archaeocyathan-radiocyathan bioherms in the Wirrealpa Limestone of South Australia**, by P.D. Kruse; No. 4 (April), pp. 601–615.

**The peculiar Ordovician trilobite *Hypodicranotus* from the Whittaker Formation, District of Mackenzie**, by R. Ludvigsen and B.D.E. Chatterton; No. 4 (April), pp. 616–622.

**A new species of graptoloid, *Dicellograptus uncatatus* n.sp., from the Blue Mountain Formation of southern Ontario, Canada**, by S.J.H. Senior; No. 5 (May), pp. 822–826.

**New acritarch taxa from the Middle and Upper Devonian (Givetian–Frasnian) of western Canada**, by R.E. Turner; No. 9 (Sept.), pp. 1471–1487.

**Reinterpretation of a larval dissorophoid amphibian from the Lower Permian of Texas**, by D.W. Dilkes; No. 9 (Sept.), pp. 1488–1492.

**Silurian (Llandoverly) graptolites from the Bay of Exploits, north-central Newfoundland, and their geological significance**, by S.H. Williams and B.H. O'Brien; No. 10 (Oct.), pp. 1534–1540.

**Ediacaran fossils and dubiofossils, Miette Group of Mount Fitzwilliam area, British Columbia**, by H.J. Hofmann, E.W. Mountjoy, and M.W. Teitz; No. 10 (Oct.), pp. 1541–1552.

**An Ichthyosaur forefin from the Triassic of British Columbia exemplifying Jurassic Features**, by C. McGowan; No. 10 (Oct.), pp. 1553–1560.

**Pleistocene ducks of the Old Crow Basin, Yukon Territory, Canada**, by G.R. Fitzgerald; No. 10 (Oct.), pp. 1561–1571.

**A Middle Cambrian trilobite faunule from the Meguma Group of Nova Scotia**, by B.R. Pratt and J.W.F. Waldron; No. 11 (Nov.), pp. 1843–1853

(The December *Canadian Journal of Earth Sciences* had not yet been received at this writing.)

## REVIEWS

from Les Adler

Dinosaur Scientist—Interview with Robert Bakker, by Darlene R. Stills, *Science Year, 1992*; World Book, Inc., Chicago; pp. 102 - 119, with 14 photographs and 3 sets of drawings by Robert Bakker.

Robert Bakker earned his Ph.D. from Harvard in 1976. He studies and teaches gross anatomy of vertebrates and is interested in the educational aspects of museums. He moved to Boulder, Colorado, to be close to his field studies in Wyoming. He works at home on dinosaurs and draws action-packed illustrations of them.

Bakker is famous for changing scientists' ideas on dinosaurs. From the interview we learn that in the fourth grade at school, Robert came across the Sept. 3, 1953 issue of *LIFE* magazine which featured the article "The Pageant of Life", accompanied by illustrations of many forms of life, including dinosaurs. While at school, his mother accompanied him to the American Museum of Natural History in New York, where he made sketches and drawings of the animal specimens. He also went to zoos and made tapes of how living animals move. He suggests that the best way to learn about the muscles and bones of dinosaurs is to buy chickens at a supermarket, take them apart and learn everything that you can about their structure, then compare the parts against a *Tyrannosaurus rex* at a museum—Bakker claims that birds are direct descendants of dinosaurs.

Some of Bakker's ideas may not be original, but he is noted for bringing these ideas to the forefront, such as that of dinosaurs being warm-blooded. He also explains his ideas on extinction and follows Osborn's ideas of large animals crossing land bridges to escape diseases, while smaller creatures do not cross and die out. He concludes that evolutionary change works through a terrible culling by death. Evolutionary changes are rare events and come in bursts. Hugh Falconer came up with the idea in 1860, which was resurrected by Stephen Jay Gould [and Niles Eldredge *-ed.*] in the early 1970s and called 'punctuated equilibrium'.

Bakker does not have one great goal; he

intends to continue his research on dinosaurs and to foster the activities of museums and zoos in educating the general public.

Review of Paleontology, by Carlton E. Brett, *Science Year 1992*, World Book Inc., Chicago.

In this article, Brett reports on several recent developments in palaeontology:

- Cambrian fossils found in China in 1984 represent 70 species of marine animals, including worms, sponges and trilobites similar to those of the Burgess Shale in British Columbia. An armour-plated onychophoran has turned out to be a close relative of *Hallucigenia* and appears to have been widespread during the Cambrian.
- The June 1990 find by Jack Horner's team included the first complete examples of *Tyrannosaurus rex*'s tiny arm bones.
- Three types of fossilized arthropods such as centipedes and an early relative of spiders, have been found in England in Silurian rocks aged 414 million years old. This is 14 million years older than similar discoveries.
- Scientists had assumed that amphibians that appeared about 360 million years ago had five fingers or five toes on each limb. *Ichthyostega* has now been found with seven digits on its hind limbs, and *Acanthostega* with eight digits on its front limbs.
- Philip D. Gingerich has reported on *Basilosaurus*, a whale of the Eocene epoch (about 45 million years ago) from Egypt, that had permanently flexed legs with three toes. The legs do not appear to have been used for locomotion, but rather for stability.
- A fossil mushroom has been found in a lump of 20 million year old amber. It had several modern features, including 'gills' on the underside. This indicates that mushrooms evolved much earlier than previously thought. [see also *National Geographic*, Aug. 1991, pg. 138 *-ed*]



## REVIEWS

continued...

The Dinosaurs of Winter, by Patricia Vickers-Rich and Thomas H. Rich, *Natural History*, April 1991, pp. 32-37.

In Alberta, collecting dinosaurs is relatively easy when there are many well-exposed and well-preserved specimens in soft sediments. At Dinosaur Cove, along the southern coast of Victoria state, Australia, the fossil beds are reached by a specially constructed wire-rope system, and hard-rock mining methods must be used to extract specimens. The work, which has uncovered extremely useful material, involves large financial expenditures and the labour of many volunteers.

The exquisitely preserved dinosaur fossils indicate that 106 million years ago in the early Cretaceous, southeastern Australia lay well within the Antarctic Circle—about 80 degrees south latitude. Plant and invertebrate fossils collected here and at other, contemporaneous sites in Victoria, suggest that the mean annual temperature was in the range of  $-3^{\circ}$  to  $+2^{\circ}$  Celsius.

Many remains of hadrosaurian dinosaurs have now been found in often remote parts of the world, indicating that some dinosaurs lived in cold climates and that the necessary vegetation was available for food. The Victorian fossils include more than 150 species, from spiders to dinosaurs and pterosaurs, ferns, conifers, mosses, quillworts, hepaticas, algae and other plants. At Koonwarra, southwest of Melbourne, about seventy species of invertebrates associated with dinosaurs have been found, including spiders, freshwater bryozoans, shellfish, crustaceans and possibly earthworms. Fish, birds and vertebrates such as *Allosaurus* survived tens of millions of years later here than elsewhere.

This was also a nursery area, as about half of the dinosaurs were juveniles. There is a very high proportion of hypsilophodonts with exceptionally large brains, which may provide clues to the hibernation habits of dinosaurs in cold climates. These dinosaurs may also have been warm-blooded. Studying these fossils may also give indications as to why dinosaurs became extinct.

*GEOS*, Volume 20, No. 3, Summer 1991. Energy, Mines and Resources Canada.

This issue has nine articles on various aspects of Canadian palaeontology, by earth scientists of the Geological Survey of Canada. Eight of the articles are concerned with the role that fossils play in unlocking Cordilleran geological history, and the last article is concerned with the role of geochronology in mineral exploration.

The Cordillera is defined as the region from Alberta's foothills and their northern extensions, westward to Canada's Pacific islands, as our share of the circum-Pacific orogenic belt. The geology is enormously varied and complex. One thing that the various belts have in common is fossils, and as W.J. Arkell once wrote: "stratigraphy without fossils is nonsense, provided that the rocks are fossiliferous."

Each article and each set of photographs is in both English and French. There are photographs of about 35 macrofossils—mostly pelecypods and ammonites, and about 60 different microfossils—conodonts and radiolarians. Five scientists are pictured and 17 geological maps and some 16 time scales with the associated fossil evidence are presented. The GSC's Chief palaeontologist, Godfrey Nowlan, discusses ammonites; the work of William Smith; and the importance of fossils to the work of the Survey. E.T. Tozer describes 120 years in the history of geological mapping and fossil collecting in the Cordillera. Another article explains how the Cordilleran fossils and time charts have been used to correct and redefine European time scales.

Fossils are used in determining the extent of faunal provinces such as Boreal (cold water) and Tethyan (warm water) and the original positions of accreted terranes that make up much of the western Cordillera. Other articles describe the role of conodonts and radiolarians in dating otherwise undatable rocks. Molluscs (pelecypods and ammonites) are also very useful in dating Cordilleran volcanic events and other types of igneous activity. A final article describes the meeting of biochronology and geochronology (using geochemical methods) to produce a relevant time scale.

## COVER STORY

Notes from Hope Johnson, LLD

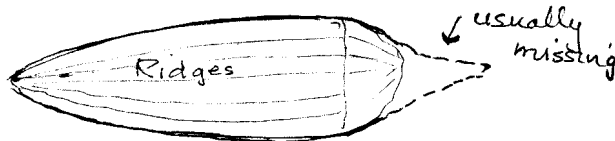
When I wrote Ms. Johnson for permission to reprint one of her illustrations on the cover of the *Bulletin*, little did I expect the wealth of documentation that accompanied her reply. Following are excerpts from her letter, for which I thank her on behalf of the Society.

— HA

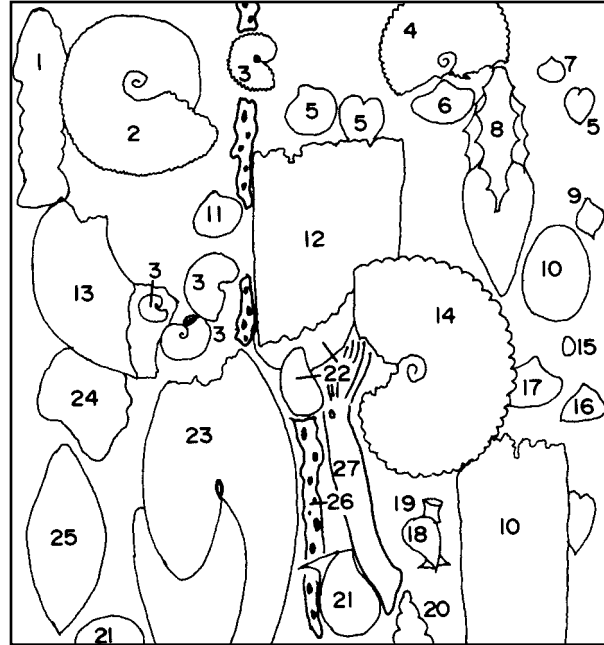
13th Feb. '92

...The original is an ink and wash (dilutions of India ink) work done by me about ten years ago...

The montage uses a number of items from the local Bearpaw marine fauna which spans the upper Campanian with part of the Maestricht time. Work has been done a little further west, I believe, on potassium/argon dating of volcanic ash layers within these limits. There are several exposures of the Bearpaw shale near to Medicine Hat. I have used forms of some of the ammonites, baculitids, other molluscs plus part of a crayfish which I had in my collection. (Some has now gone to the Royal Tyrrell Museum.) Smaller items were fitted in here and there, plus 2 seaweeds (not necessarily present in those times), a sea anemone and "water", bubbles and chunks of the concretions in which the fossils are usually found. Some break loose. The squid-like object was put in because I had sent Dr. P.S. Warren [deceased] of the U of A an item which he said was the pro-ostracum of a squid. I'm unsure of this identification, but in any case the gladius of a pre-cuttle occurs especially near Manyberries. This cephalopod's internal shell is called *Actinosepia canadensis* Whiteaves. They are usually about 20cm long and 9cm wide at the maximum measure.



They preserve as a dark horn-like crust with ridges. Sometimes a calcareous coating is preserved with an "ornament" of star-like tiny nodes. The internal shell of modern squids is very small in comparison to the body size, so this primitive cuttle (a modern genus is *Sepia*) must have been a good size.



Key to cover illustration—Bearpaw Fm. fossils

- 1 crayfish, *Macrura* sp. (appendages not preserved)
- 2 *Placenticerus intercalare* Meek
- 3 small Scaphitid ammonites
- 4 *Jeletzkytes brevis* (Meek)
- 5 *Protocardia subquadrata* (Evans and Shumard)
- 6 *Liopistha (=Cymella) undata* (Meek and Hayden)
- 7 *Ethmocardium* sp.
- 8 *Placenticerus intercalare* Meek (axial aspect)
- 9 small gastropod (unidentified)
- 10 septal wall of *Baculites baculus* Meek and Hayden
- 11 *Dosiniopsis deweyi* (Meek and Hayden)
- 12 *Baculites compressus* Say
- 13 *Rhaeboceras albertense* (Warren)
- 14 *Rhaeboceras subglobosus* (Whiteaves)
- 15 *Haminea occidentalis* (M & H) —a small gastropod
- 16 *Anisomyon centrale* Meek —a limpet
- 17 *Cymbophora warrenana* (Meek and Hayden)
- 18 *Phelopteria linguaeformis* (Evans and Shumard)
- 19 a fish vertebra
- 20 *Melania* sp. —a gastropod
- 21 *Oxytoma nebrascana* Evans and Shumard
- 22 *Inoceramus* sp.
- 23 *Placenticerus meeki* Boehm
- 24 *Crassostrea* sp. —an oyster
- 25 *Arctica ovata* (Meek and Hayden)
- 26 *Laminaria* —an alga
- 27 squid, perhaps like *Actinosepia canadensis*?

...The names have been revised frequently in many cases. I've put in some synonyms, but I really wouldn't be able to catch up with them all! [we all empathize with this point!...ed.] The first name I'm favouring will be in

accordance with those in *The Type Fox Hills Formation, Cretaceous (Maestrichtian), South Dakota, Part 2, Systematics of the Bivalvia* by Ian Speden; Bulletin 33, Peabody Museum of Natural History, Yale University, 1970.

I have used A.C. Riccardi's Bulletin as a reference on the ammonites and ammonoids. [Riccardi, A.C. (1983) *Scaphitids from the Upper Campanian–Lower Maestrichtian Bearpaw Formation of Western Canada*. Geological Survey of Canada, Bulletin 354; available from the ISPG publications sales office, Calgary; also at the GSC in Ottawa and Vancouver –ed.]

Both Speden's and Riccardi's illustrations indicate that all species show a good deal of variation. There are some illustrations of Bearpaw fossils here and there in Geological Survey memoirs, names probably no longer identical with those used now. I believe that Dr. Waage at Yale, and an expert in invertebrate fossils at the United States Geological Survey are the two authorities.

Note: the drawings really can't be used to make identifications with any certainty, except for, say, the two morphs of *Placenticerias*—one with crimped edges, double rows of nodes well developed, and one with plain edges and no nodes at all. Intermediate individuals are common, the departure into nodes etc. beginning with crimped edges, then some with low umbilical (central→outward) nodes, then developing the outer nodes. This is not a gender development because of the many gradations to be found! It is suggested that males may have been very small.

Re: *Oxytoma*, also called *Hypoxytoma*—the right and left valves are subequal. The right valve is evidently smaller than its partner. The species "is distinctive and unlike any other species of the genus from the Upper Cretaceous of North America"...

I hope that this helps.

Yours sincerely,  
Hope Johnson, LLD

[A second montage and further notes were submitted by Ms. Johnson. These will appear in a future issue of the *Bulletin*. –ed.]

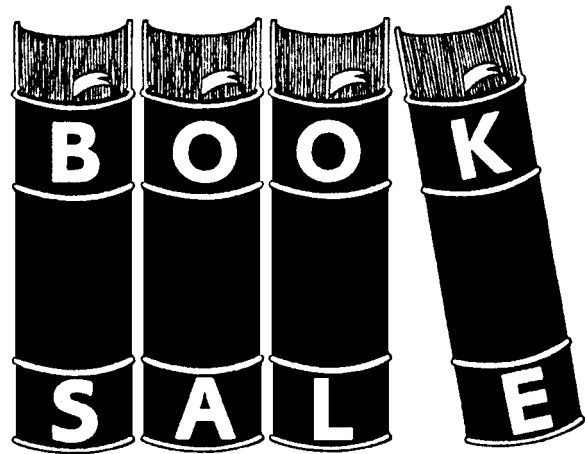
## ONTARIO FOSSIL HUNTERS!

The following notice, from the newsletter of the Central Canadian Federation of Mineralogical Societies (CCFMS), was submitted by Trudy Martin of the Calgary Rock and Lapidary Club:

The Ontario Paleontology Association has sent a folder to all clubs outlining its aims, fees, etc. There will be a newsletter and field trips (Arkona/Thedford, April 18–19 and Manitoulin Island, October 3–4, 1992). For further information contact Richard Pellatt, Sr., 1403 Pl. Hurtubise, Sudbury, Ontario, P3A 2G5, Telephone 1-705-560-3974.

[APS members who plan to be in Ontario at these times might wish to investigate further ...are you out there, Heather Whitehead??]

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### USED BOOKS

Garage Sale

**SATURDAY, APRIL 11, 1992**

**10:00 a.m. to 4:00 p.m.**

Sale to clear out thousands of geological and palaeontological publications. Most all of these are out of print. Very reasonable, everything priced.

**No pre-sale viewing please.**

**LOCATION: Home of Harvey Negrich, at**

**3011 Hampton Crescent, SW  
Calgary, Alberta  
Phone (403) 249-4497**

Will consider reduced lot prices on Sunday, April 12 '92

# APS MEMBERSHIP LIST

By popular demand, a listing of APS members as of March 18, 1992 is printed below. Please locate your name on the list to ensure that your dues for 1992 are paid-up. The second column from the right lists the expiry date of your membership. The far right column shows the amount you have paid (\$10.00 individual, \$15.00 family).

**DUES NOT PAID BY MARCH 31, 1992 WILL RESULT IN CANCELLATION OF MEMBERSHIP, and no further Bulletins will be received.** All costs for missed back-issues must be paid upon renewal. Please use the tear-out membership renewal form supplied on the back of the December 1991 *Bulletin*.

**NOTE!**— the society's new mailing address is listed on page 1 of this issue.

Phone numbers have been left off this list for several reasons: first, they wouldn't fit across the page; second, not all numbers are available; third, some numbers are unlisted; and fourth, the editor wishes to avoid being lynched by an angry mob.

**Names and contact information removed  
to protect members' privacy.**