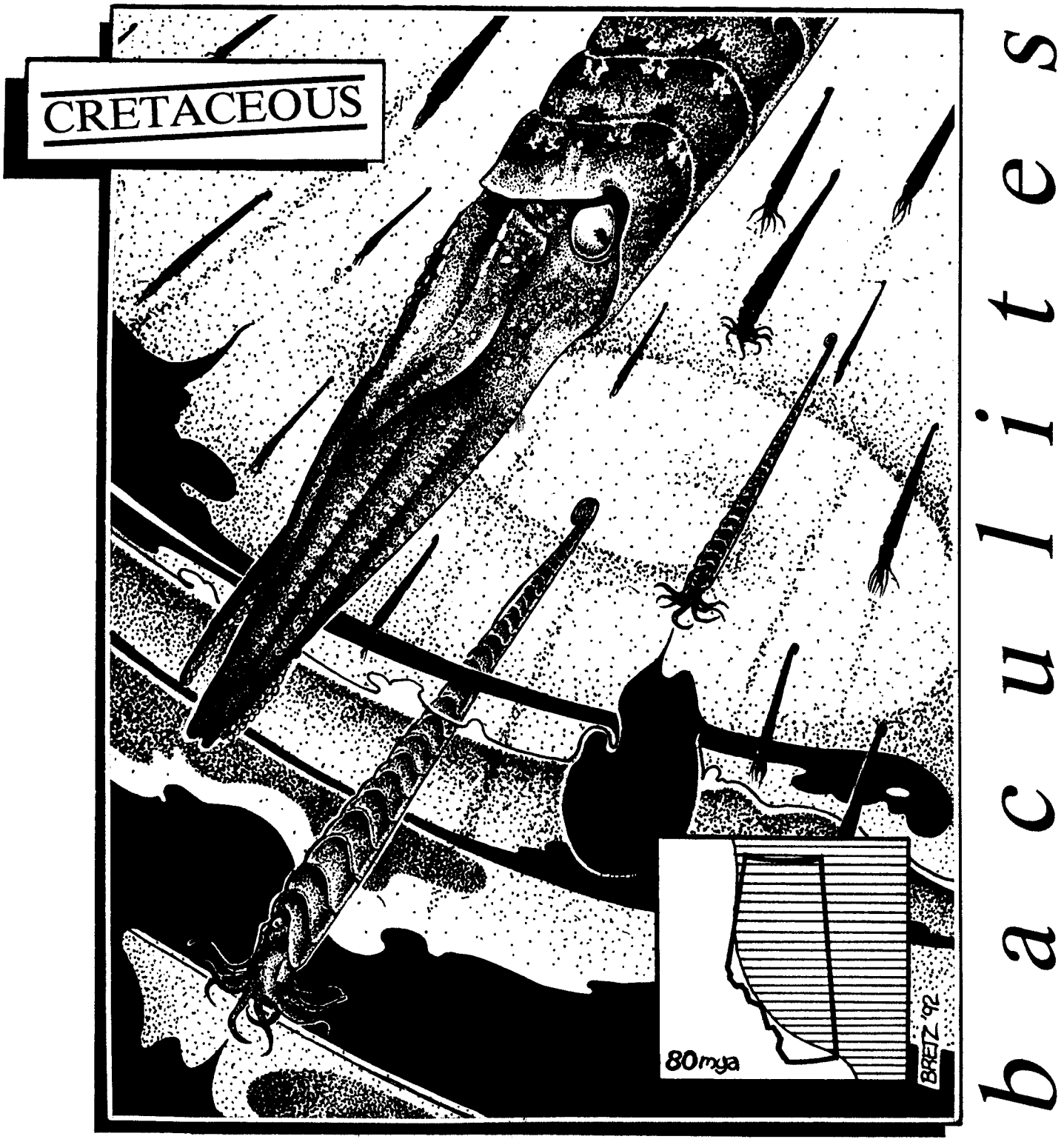
ALBERTA • PALAEONTOLOGICAL • SOCIETY

BULLETIN

VOLUME 8 NUMBER 1 MARCH 1993



baculites

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 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

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

†APAC is the Alberta Palaeontological Advisory Committee

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UPCOMING APS MEETINGS

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

March 19*—Holger Hartmaier: "Geology and Palaeontology of the Oldman River Dam Area"

April 23—Howard Allen: "Collecting Microfossils"

May 21—Wayne Braunberger: TBA—aspects of invertebrate palaeontology

*Bulletins will (hopefully) be distributed to members in attendance.

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ON THE COVER: "A large squadron of nautilus-like *Baculites* dart to the surface, startled by something below"— *Baculites minerensis*, lytoceratidian cephalopod, Upper Cretaceous epieric sea, North America. Art by APS member Chris Bretz.

President's Message

by Les Adler

The last two meetings were very successful, with attendance of about twenty members each, despite the snow and cold temperatures. Plenty of 'freebies' have been available and excellent speakers have brought in specimens to examine. T-shirts will be distributed at the March 19 meeting or soon after. We have ordered many extras to avoid a surcharge of $3.00 on subsequent orders. About 150 T-shirts are available, with about 70 already accounted for.

You may be wondering why we are working on set dates and set locations for field trips when the outside temperature is -14°C and there is thirteen centimetres of snow on the ground. We require a long lead time so as to compensate for the various obstructions both predictable and unpredictable, which will be occurring over the next six months. Past problems have included steep cliffs, deep water in the creek, mosquitoes, gnats, cactus spikes, loose hammer heads and lost hammers; battered oil sumps, a bus backing without warning resulting in the loss of my Chevrolet hatchback; a tipped-over Cadillac, heavy rain, extremely high temperatures, uncooperative landholders; lost telephone numbers and notes due to a flood, a lost field chairman, and one leader disappearing altogether and not reappearing (a replacement was found). However, on the whole, when a trip does take place the locations have been excellent, we have seen outstanding geology, and an excellent set of field notes does appear, although not always with the trip itself.

The three field trip possibilities being examined fit in with the past trips which ranged over the southern parts of Alberta, British Columbia and Saskatchewan, resulting in the collection of fossils from the Ordovician, Devonian, Carboniferous, Jurassic and Cretaceous periods, and plants from the Paleocene epoch.

If you are considering coming on a field trip, phone Les Fazekas at frequent intervals starting at the end of April, to find out if permission has been obtained to get on the site. We find that about half the people who make enquiries do not appear and on the day of the trip about six extra people arrive who are not members. Not to worry! We usually have an extra supply of field notes on hand.

Holger Hartmaier, from Okotoks, will be taking over the arrangement of programs late in 1993, and Vaclav Marsovsky is now looking after the membership list. Later we will be looking for someone to take care of advertising, shows and public relations. By the time this issue arrives a Chinook will have appeared and it may be possible to get out and trim some of last year's fossils. ❑

From the Editor…

by Howard Allen

"A great disappointment occurred in Alberta, Canada, where a coal strip mine had exposed a cliff covered with thousands of perfectly preserved dinosaur footprints. Louie decided to wait a day to photograph them in better light. 'I thought I had the luxury of time. Those tracks had been there for 110 million years. What was one more day?' But the next morning he found the cliff had collapsed, destroying the tracks."

Readers will no doubt recognize these lines from the January 1993 *National Geographic* Magazine (inside back cover). After the initial shock of this tragedy had passed, my first thought was: why did I, the editor of the *Alberta* Palaeontological Society Bulletin, have to read of this incident first (and, to date, *only*) in a US magazine—and no doubt many months after the fact? Obviously I'm not standing neck-deep in the stream of current events (heck, I don't even subscribe to the local papers!).

This is where you, the readers come in—I need more eyes and ears to keep track of the goings-on in the 'palaeo' world. Don't assume that, just because an article appeared in the *Calgary Herald,* Howard must have seen it… he probably didn't! Hand over, or send in those news items! (Please mail any correspondence to my home address—see page 1—my contacts with the APS post office box are irregular at best). *Stegosaurus* is known to be an offshoot of the theropod lineage, with *Triceratops* and *Iguanadon* representing intermediate forms.

Another aspect of the *Bulletin* I would like to invite readers to participate in is accuracy of the contents. Although I try to ensure items are as lucid and correct as possible, it can happen (under rare circumstances) that something slightly inaccurate, or—perish the thought—downright goofy, may escape the notice of my eagle eyes. Although I'm quite sure nothing of this sort has occurred to date, please don't hesitate to draw any future slip-ups to my attention. I have broad shoulders.

Finally, saving the best for last: abject, grovelling thanks to our new member, Chris Bretz, a student at the Alberta College of Art, who is responsible for this issue's spectacular cover. In an accompanying note, he writes: "…I am interested in becoming more involved with the *Bulletin.*" Twist my arm, Chris! As for the rest of you, I hope you enjoy the issue…too bad you have to wait till May to see the next cover! ❑

1992 Field Trip Report

by Gerry Morgan

Upper Edmonton (Upper Cretaceous – Lower Paleocene) localities near Huxley, Alberta: August 15, 1992

On the morning of Saturday, August 15 about a dozen members and friends assembled under a sunny sky at Dry Island Buffalo Jump Provincial Park, which is located on the west side of the Red Deer River about 60km north of Drumheller and 20km east of the small town of Huxley. The group first drove to Knudson's farm about 6km southwest of the park. Here we were given approximate directions to a locality in a coulee tributary to the Red Deer River valley in the NW 1/4, Sec. 10, Tp. 34, R. 22 W4M. Apparently this locality, which consists of Scollard Formation (upper Edmonton Group) deposits, had a few years earlier yielded portions of a *Tyrannosaurus* skeleton which is now on display at the Royal Tyrrell Museum of Palæontology.

On arriving at the coulee we were unable to locate the site of the *Tyrannosaurus* excavation, but on descending into the valley members quickly found an indurated sandstone layer which contained fairly abundant but generally only moderately well preserved plant leaves. Most members remained at this leaf site collecting specimens for an hour or so, while a few people wandered further afield, mainly in search of vertebrate remains, which were almost entirely absent at the leaf location. The present writer descended further down into the Battle Formation, the formation immediately underlying the Scollard Formation. In this lower part of the coulee the writer obtained a fairly well-preserved centrum of a caudal(?) vertebra probably from a hadrosaur. This was, I believe, the only vertebrate fossil found during the morning, and possibly the whole day.

Subsequent to the field trip the writer has had the opportunity to look into the literature on this area and has discovered that in 1946 Charles M. Sternberg located two fragmentary dinosaur skeletons at this locality, a badly fractured skeleton of *Tyrannosaurus rex* and, about 180m to the north, a scattered skull of *Triceratops albertensis.* At that time parts of the *Triceratops* skull were removed, but the badly fractured *T. rex* was left behind. Lerbekmo *et al* (1979) reported relocating the *T. rex* skeleton during the course of palæomagnetic sampling in the area, and they noted that although some of the skeleton had been scattered downsection, parts of several large bones were still *in situ* within a concretionary layer. The paper by Lerbekmo *et al* contains a photograph showing the bluff where the *T. rex* skeleton was found, and with the aid of this it might be possible for a future field trip to locate the exact position of the find, although whether the *in situ* bones mentioned by Lerbekmo are still present is not known. Possibly they are the bones that have been put on display at the Royal Tyrrell Museum.

The two skeletons mentioned above are of interest as they are among the stratigraphically highest *in situ* dinosaur remains found in the Red Deer River valley. In fact, as of 1986 the *Triceratops* skeleton, found just 4.5m below the Cretaceous-Tertiary (K-T) boundary, is the highest *in situ* skeleton, and the *T. rex*, 10.5m below the K-T boundary, is only slightly lower. As discussed below, the K-T boundary is located within the Scollard Formation at the base of the Nevis (No. 13) coal seam, which in this area is only 30cm thick and is apparently easily missed. The photograph in Lerbekmo *et al* (1979) shows the position of the Nevis coal seam at the *T. rex* site and should aid any future field trips in locating the K-T boundary here.

At about one o'clock the group reassembled and drove back to Knudson's farm, where we were given directions to the now fairly well-known exposure of the K-T boundary about 1.5km east of the farm, just below the rim of the main valley of the Red Deer River in the NE 1/4, Sec. 11, Tp. 34, R. 22 W4M. On arriving at the rim of the valley, members parked their vehicles and had lunch while enjoying a spectacular view of the sunlit river some 160m below us, and the adjacent badlands scenery stretching to the north and south.

After lunch, members descended the side of the valley in search of the K-T boundary, which has been located (approximately, by numerous palynofloral extinctions and more precisely by geochemical means—specifically the presence of a pronounced iridium anomaly (Lerbekmo and St. Louis, 1986)) at the base of the Nevis (No. 13) coal seam. We would probably have missed the crucial exposure but for the fact that at the farm we had been told that Dr. Richard Fox of the University of Alberta had been at the site a few days earlier, and signs of obviously recent excavation a little way below the rim in the vicinity of a thin carbonaceous layer (presumably the Nevis coal seam) led us to believe that we had located the K-T boundary exposure.

After studying this exposure for a short while members explored further down the side of the valley. Some distance below the boundary exposure an apparently *in situ* fossil tree trunk was seen, and exposures of the Kneehills tuff were also noted. The writer spent a few more hours in the general vicinity searching mainly for vertebrate remains, with a singular lack of success. Apparently

this was also the experience of other members.

I'm sure that all participants in this trip enjoyed a very pleasant day visiting interesting localities which are probably not normally easily accessible, with some attractive scenery thrown in, under almost perfect weather conditions.
[*A field guide to this trip has been prepared by Wayne Braunberger and is available to APS members. —ed.*]

References—

Lerbekmo, J.F., Singh, C., Jarzen, D.M., and Russell, D.A. (1979) *The Cretaceous–Tertiary boundary in south-central Alberta—a revision based on additional dinosaurian and microfloral evidence.* Canadian Journal of Earth Sciences, Vol. 16, pp. 1866–1869.

Lerbekmo, J.F., and St.Louis, R.M. (1986). *The terminal Cretaceous iridium anomaly in the Red Deer River Valley, Alberta, Canada.* Canadian Journal of Earth Sciences, Vol. 23, pp. 120–124. ❑

FIELD TRIPS 1993

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.* For more information, call Les Fazekas at 248-7245.

TRIP 93-1: June 19 & 20, 1993
Coronation and Hanna areas, Alberta

Several exposures of the Upper Cretaceous Bearpaw Formation occur in this area. Various ammonites, including *Baculites* and other invertebrate fossils may be found, including occasional crayfish.

TRIP 93-2: July 17, 1993
Nihahi Ridge, Alberta

Spectacular geology and scenery are high points of this location in the front ranges of the Rocky Mountains west of Calgary. Access to late Palaeozoic fossil localities involves a moderately strenuous hike and, for the more ambitious, minor rock-scrambling.

TRIP 93-3: August 21, 1993
Genessee or Blackfalds, Alberta

Beautifully preserved plant fossils occur in the Upper Cretaceous Horseshoe Canyon Formation at the Genessee locality, southwest of Edmonton. As this locality is tentative an alternate location, on the Red Deer River near Blackfalds, may be substituted. Paleocene gastropods and plant fossils occur at this site, the type area of the Paskapoo Formation. ❑

Reviews

from Les Adler

Alas, Poor *Notharctus!* by John P. Alexander, *Natural History*, August 1992, pp. 54–59.

John Alexander manages the fossil mammal collection at the American Museum of Natural History. A specimen found June 12, 1988 from the Bridger Basin in the southwest corner of Wyoming was brought in with some Eocene fossil turtles. Fortunately, it was put aside on a table—otherwise it would have been put in a drawer with other specimens and forgotten for many years.

One quiet Saturday afternoon, Alexander examined the specimen and observed a postorbital bar on the skull, indicating a primate skull. The dentition indicated *Notharctus*. This is the first complete, uncrushed representative of an early notharctid prosimian, the common ancestor of monkeys and apes. Previous reconstructions can now be seen to be inaccurate. The large canine teeth and the sagittal crest or ridge of bone indicates that the specimen was a male. A hole in the skull showed that the neck had been broken by a bite from behind and that the right side of the face had been crunched in the jaws of a predator.

As a consequence of this find, Alexander reexamined the museum collections and found a second *Notharctus* which had been collected in 1922. Alexander went to the Bridger Basin region and was fortunate, in July 1991, in finding a whole jaw and then two more good specimens.

There have been many articles in *Natural History* on the hunt for primates in the Great Rift of Africa and the "dragon bone" caves of China; now we are looking at a rich depository of fossil primates in North America. [*There are also many fragments of primates being found in Alberta, including around Cochrane—L.A.*]

Eocene sediments of western Europe contain a splendid fossil record of certain primates, but the relationship between these and their North American cousins is obscure. The arctic region was temperate allowing primates to move between the two continents. A few million years later connections became severed, plate tectonics widened the gaps and prosimian groups in the Old World and the New World apparently evolved separately.

World temperatures cooled in the Oligocene and woodlands gave way to grasslands. Some prosimians may have survived the Oligocene in Mexico and Central America until New World monkeys took over arboreal niches. The last North American prosimians date back to the early Oligocene, 27–34 million years ago. The fossil record in Europe also dwindles away. Fossils of lemur cousins from the late Tertiary come from

Asia and Africa. The only post-Oligocene fossil record of lemur-like creatures comes from comparatively recent deposits on the island of Madagascar, the last stronghold of living prosimians.

Notharctus demonstrates that an advanced state of primate evolution had been achieved by the Eocene Epoch, 50 million years ago. It had stereoscopic vision and grasping hands and feet, with nails instead of claws; already very much like those of later anthropoid primates. By studying today's lemurs, scientists are able to gain some idea of what the life of an ancient relative of man, such as *Notharctus* was like, so as to picture more accurately the early stages of *Homo* sp. A skeletal mount and a mural depicting *Notharctus* will be displayed in the American Museum Hall of Human Biology and Evolution in the spring of 1993. The moral of this piece?...if you contemplate a primate skull as in Shakespeare's *Hamlet*, it can lead to a display at the American Museum of Natural History!

This View of Life: Dinosaurs in the Haystack, by Stephen Jay Gould, *Natural History*, March 1992, pp. 2–13.

In these pages, Gould discusses the effect of a catastrophe theory of mass extinction on palaeontological research. The idea of an extraterrestrial impact has increased in strength and supporting evidence to such a point that few scientists deny that an impact occurred; the debate has shifted to questioning whether the impact caused the extinction totally or just finished off a process already in the works.

Palaeontologists dislike the Alvarez impact hypothesis; but, being scientists, they have discussed the theory's implications. Specialists in the study of ammonites and dinosaurs have now looked far more carefully through the upper 30 feet of sediments below the Cretaceous–Tertiary boundary in many locations. Surprisingly, they have found far more specimens close to the boundary, and none above the boundary. Gould philosophizes on the effect of a possible sharp extinction rather than a previously accepted gradual extinction. The title of this essay refers to the general lack of fossils near the boundary.

Hominoid Update, *Natural History*, June 1992, pg. 67.

On March 28, 1992, the American Museum of Natural History, together with the Wenner-Gren and L.S.B. Leakey foundations sponsored a gathering of twenty leading scholars who brought their specimens and casts to New York for an unprecedented one-day "show and tell" workshop. The purpose was to pool all the recent discoveries of hominoid fossils, particularly the middle Miocene dryopithecine finds from different parts of Africa, the Middle East and the Mediterranean:

• Mary Leakey of the Kenya National Museum announced that *Xenopithecus,* from the fossil beds west of Lake Turkana, has been redated to 28 million years old (Late Oligocene), at least 5 million years older than any other known hominoid.

•Elwyn Simons of Duke University discovered an arboreal hominoid arm bone from Miocene fossil beds at Moghara, in northwestern Egypt.

• *Kenyapithecus* has been redated to as recent as 12 million years old.

• The participants clearly favoured the view that the African and European dryopithecines were more closely related to hominid origins than to the origin of the orangutans. *Otavipithecus* is closer to these non-Asian primates than to any other primates.

This View of Life: Magnolias from Moscow by Stephen Jay Gould, *Natural History*, September 1992, pp. 10–18.

Gould visited Moscow, Idaho, USA., to give some lectures and was taken on a field trip to the Miocene lake beds (17–22 million years old) exposed near the town of Clarkia. The beds, owned by the Kienbaum family, are only 50 yards off the main highway and have been given the address "Eighty-fifth and Plum" (eighty-five miles from Spokane and plum out of nowhere!).

Charles J. Smiley of Idaho has researched these beds, which contain plants, insects and fish. The method of obtaining specimens is to peel off film after film in the layers with a knife. The flora includes bald cypress, tupelo and magnolia, indicating a warm, temperate forest. The fossils retain their original colours, as the leaves blew directly into the lake, were buried quickly in an environment free of oxygen, and stayed water-saturated until exposed by collectors 20 million years later.

It is now possible to extract and sequence DNA from chloroplasts of the leaves of *Magnolia* sp. and *Taxodium* sp. This has been done by Karl Niklaus who has skills in chemical analysis. DNA has been extracted from Egyptian mummies, African quaggas (extinct relatives of the zebra), frozen mammoths and from a 13,000 year old sloth. The record now jumps from 13,000 years to more than 13,000,000 years, a thousand-fold jump.

In comparing an 820 base-pair sequence between the Miocene *Magnolia latahensis* and the present day *Magnolia macrophylla*, Goldenburg and colleagues found differences in only seventeen positions. Thirteen of the seventeen substitutions are silent while four involve changes in an amino-acid. Soltis and colleagues examined a 1320 base-pair sequence in *Taxodium* specimens showing that the amino-acid sequence for the "rbch" gene

has been unchanged for 20 million years. The changes in species so far examined has been in the order of only one or two percent.

Gould states that the sequencing of DNA is a striking illustration of the fact of evolution, providing evidence which can be tested; this is a new dimension of evidence. Molecular biology is trendy and expensive, but the fossils themselves are needed to confirm the general body form.

The Gold Bugs by Derek Briggs and Gregory Edgecombe, *Natural History*, November 1992, pp. 36–43.

This article describes the contents and the importance of Beecher's Trilobite Bed located in the late Ordovician Frankfort Shale near Rome, New York. William Valiant, assistant curator at Rutgers College took from 1884 to 1892 to find the restricted level of the outcrop from which trilobites had fallen into a creek. These fossils were eagerly sought because the tissues as well as the exoskeletons had been filled or replaced with pyrite. Apart from this fossil bed, the only other prime example of soft tissue pyritization is Germany's Hunsrück slate bed (early Devonian), containing crinoids, starfish, molluscs, trilobites and other arthropods, with their bodies replaced by pyrite.

In 1893 Charles Beecher of Yale University took over the study of New York's golden trilobites and mined out the site. The bulk of the material disappeared and the exact location was forgotten. Attempts were made from 1969 to 1984 to relocate the bed. Subsequently, palaeontologists from the National Museum, Washington D.C., and the American Museum of Natural History conducted an extensive joint excavation in 1989.

The importance of this bed is that it is the only known bed of the Ordovician period producing soft-bodied fossil preservation. Worldwide there are about sixty other locations including the Burgess Shale of British Columbia which produce soft-body preservation, but they are of different geological periods. Using X-rays and stratigraphic studies, palaeontologists have been able to deduce the ecology of the life stages of the trilobites *Triarthus*, *Cryptolithus* and *Cornuproteus*, and of *Climacograptus*, a floating graptolite. It appears that there is also a connection here to the Ashgillian event of 440 million years ago—a large marine extinction that wiped out trinucleid trilobites. It was probably caused by a glacially induced fall in sea level. Oxygen was lost and extinction due to death by asphyxiation occurred as more mud came in. The resulting muddy sea favoured *Triarthus.*

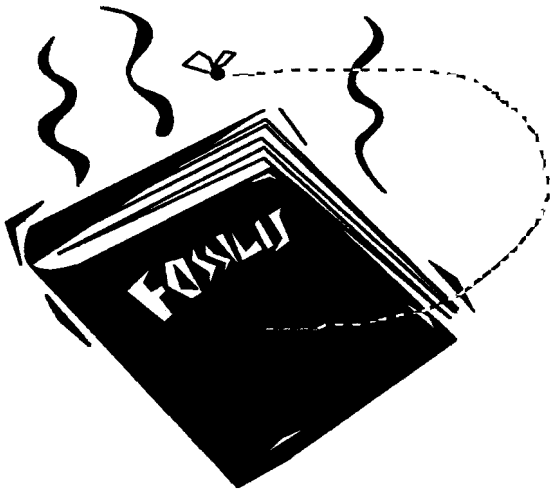
The article is accompanied by a painting and eight beautifully detailed photographs of pyritized specimens. ❑

Solution to a Musty Problem

[*This item, reprinted from* The Earth Science News *(Earth Science Club of Northern Illinois) Dec. 1992, originated from* Breccia *via* The Rockfinder *and others—the original author is unknown. Collectors of old geology books (Harvey Negrich and Gerry Morgan) take note! —ed.*]

How many times the trip to a bookstore is a disappointment. The volumes or periodicals wanted are too musty to consider purchasing. The smell alone is a strong deterrent—and to one with allergies, an impossibility. But there is a way to rid books and magazines of this disagreeable odor. One that is easy and inexpensive. Some very early *Mineralogical Record*s were sold very cheap because they were so musty they were virtually impossible to hold and read. After treatment, they have been read from cover to cover and now reside in a collection.

Place in one end of a box that is larger than the material to be deodorized, several handfuls of untreated charcoal briquettes. Wedge open the books or magazines here and there with something that will allow the air to circulate—twigs work well. Place a rolled newspaper between your valued items and the briquettes, being sure there is room for plenty of air movement. Close the box and wrap tightly in a plastic bag, and leave it alone for as long as three to four weeks. It works! Try it. ❑



FOSSILS UNDER GLASS

by Howard Allen

THE SECRET OF THE PYRAMIDS

When, some years ago, I asked a few friends and acquaintances to bring back *small* samples of *beach sand* from their holidays abroad, I was unprepared for the resulting landslide of sand, soil, dirt, dust and miscellaneous debris that followed. After sorting through the deposits, and burning or bleaching the potentially creepy-crawler-infested soil and dirt samples (importing of soil is a federal offence—and with good reason!), I have been left with a fairly remarkable collection of sand samples, from beaches as far-flung as Northern Ireland, Antarctica, India and Costa Rica.

One of the offerings that initially caused me to roll my eyes was a small plastic bag from Egypt, labelled "*sand on outside of Ancient Pyramid*". Upon closer examination, I noticed that the dusty contents included a few odd, lens-shaped objects, up to about 1cm. in diameter…nummulites! Spreading the small sample—about a teaspoon full—under the microscope I was astonished to see a rich assortment of well-preserved microfossils, including both foraminifera and ostracods, some of which are illustrated on these pages.

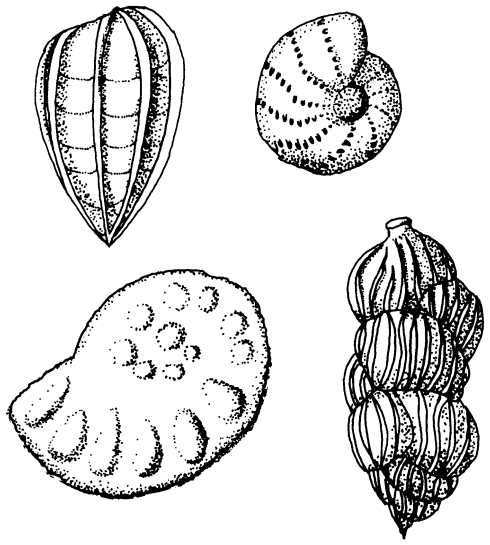


Figure 1: Foraminifera, Eocene Mokattam Formation, Pyramids of Giza, Egypt (clockwise from top left): *Rectuvigerina* sp., x65; *Elphidium* sp., x40; *Uvigerina* sp., x60; unidentified thick-walled, planispiral foram, x20 (all drawn from specimens).

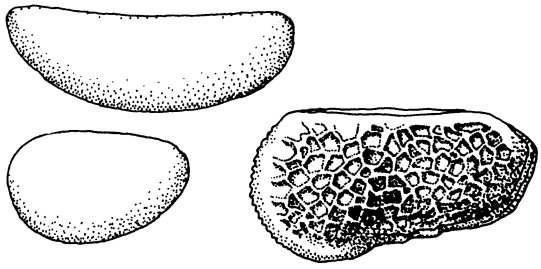


Figure 2: Ostracods, Pyramids of Giza, Egypt. Three of about a half-dozen unidentified types; all approximately x50 (drawn from specimens).

The most spectacular find was, of course, the nummulites—shells of the biggest protozoans ever to (…ooze?) across the face of the Earth. As microfossils go, you can't get much more spectacular than this. The Guinness Book of Records (1986) lists the largest known protozoan to be a foram of the genus *Nummulites,* from the Middle Eocene of Turkey, which grew to a whopping 22cm in diameter! Please note that this is a *single-celled organism!*

As a bit of research revealed, mine was not the first discovery of fossils in the building-blocks of the pyramids. Herodotus observed nummulites (Latin *nummus*= "coin" …as in *numismatics*) in the pyramids in the 5th century B.C. (Loeblich and Tappan, pg. C55). Later, in the 1st century A.D., the Greek geographer Strabo reported that "heaps of stone chips lying in front of the pyramids" were the petrified remains of lentils—left behind by the pyramid builders (Sears, pg. 12).

The pyramids at Giza were built from locally quarried limestone of the Eocene Mokattam Formation (≈50 million years old) (Sears, pp. 12, 18). Part of this formation was deposited on a tropical, shallow-water bank in the ancient Tethys Sea, which once covered much of what is now southern Europe, north Africa and southern Asia. The Tethys sea gradually disappeared during the Cenozoic Era, as plate-tectonics pushed Africa and India northward, bulldozing marine deposits into the huge piles we now know as the Alps and Himalayas. The modern-day Mediterranean Sea is about all that is left of the Tethys.

As the northern part of Africa was slowly lifted upward, the shallow-water bank already alluded to, which consisted in large part of the countless tests (shells) of nummulites, developed a barrier reef of coral, which can be seen preserved in rocks adjacent to the Sphinx (Sears, pg. 12). A shallow lagoon developed behind this reef, accumulating interbedded layers of limestone and shale. It is this limestone, as well as that of the

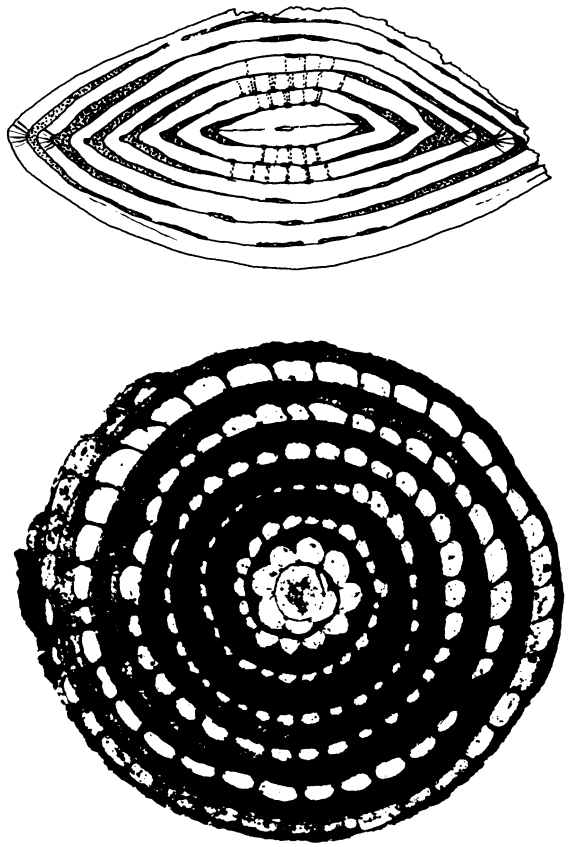


Figure 3: *Nummulites gizehensis*, Eocene Mokattam Formation, Pyramids of Giza, Egypt. Transverse (top, x15) and median (bottom, x12) sections (both from specimens).

underlying nummulite bank that, after much further uplift, was eventually quarried for the pyramids and the Sphinx.

The quality of preservation of the fossils is evident in the thin sections of the nummulites I was able to prepare (figure 3), in which all details of the shell structure are clearly visible. Many of the smaller fossils are equally well preserved. One or two short bursts in an ultrasonic cleaner removed most of the chalky matrix clinging to the forams and ostracods, revealing fine reticulation, pores and ribbing.

Keep your eyes (and your mind) open. Your next visit to an apparently stale and well-trodden tourist mecca could turn out to have an unexpected bonus—fossils turn up in the least likely places.

Acknowledgements: Thanks to that unknown soldier, a friend-of-a-friend, who supplied the sand sample from Egypt. Thanks also to Randall Quon, who brought to my attention, and provided a copy of, the article by Sears.

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Sears, Margaret (1990) *Nummulites: Time Capsules of the Desert Sands.* Rotunda, Fall 1990, pp. 12–19. [An interesting, well-illustrated article in the magazine of the Royal Ontario Museum— recommended reading, although Sears, an expert in Near Eastern Studies, seems to be struggling with concepts of geological time and evolution…read with caution.)] ❑

Highlights from Exchange Bulletins…

The APS receives several bulletins and newsletters from other societies and clubs on a regular basis. Members are encouraged to examine copies of these, which are filed in the APS library. —ed.

The Earth Science News—Earth Science Club of Northern Illinois (ESCONI)

June 1992

• *Mazon Creek Molluscs,* by Jim and Sylvia Konecny—A seven-page, illustrated article with bibliography, on molluscs of the famous Mazon Creek, Illinois fossil locality (Pennsylvanian).

• *Historical Chasmosaurus,* by Allen A. Debus—The fifth in a fascinating series on the treatment of dinosaur species in the scientific and popular literature, from their initial discovery to the present; profusely illustrated; bibliography.

July–August 1992

• *Setting up Housekeeping,* by Roger Pabian—Points out the many types of organisms that may be found encrusting larger specimens, and the conflicts created when rules for judging of competition specimens call for removal of excess matrix.

September 1992

• *Creature Corner: ESCONI does it again!* By Andrew A. Hay—An illustrated article describing a new cerianthid anemone discovered in the Mazon Creek fossil beds by an ESCONI member. This is the first anthozoan (corals & anemones) known from the Mazon Creek fauna.

• *Fantasy Dinosaurs—Revisited,* By Allen A. Debus—An illustrated, six-page discussion on the recent appearance of dinosaurs in science fiction, fantasy and pulp literature.

October 1992

• *Into the Valley of the Dinosaurs,* By Allen A. Debus—A six page, illustrated article on discoveries made by the Polish-Mongolian dinosaur expeditions conducted between 1963 and 1971, with a historical overview of earlier work in Mongolia.

November 1992

• *General Meeting, Sept. 11, 1992* — details of changes to the famous palaeontological displays in Chicago's Field Museum, as discussed by guest speaker Eric Gillenhaal, of the museum staff.

• *Creature Corner: Is it a wing?* By Andrew A. Hay—an illustrated discussion on how to distinguish between insect wings and similar-appearing fern leaves, both of which occur in the Mazon Creek fossil beds.

• *Into the Valley of the Dinosaurs,* By Allen A. Debus—second of two-part article (see Oct. 92).

December 1992

• *Guide to the Fossil Fauna of Mazon Creek* —A notice to those interested in ordering a copy of the guidebook to this famous fossil locality, which is now going to press. Cost will be in the US$50–$75 range. To reserve a copy, contact Dr. Christopher T. Ledvina, Mazon Creek Project, Northeastern Illinois University, 5500 N. St. Louis Avenue, Chicago, Illinois 60625, USA.

• *The Case for Amateur Fossil Collecting: Restrictions would be Counterproductive,* By Cecilia Duluk—guest editorial on the now infamous "Baucus bill" (US Senate S-3107), which would impose strict limitations on fossil collecting by amateurs.

• *Solution to a Musty Problem*—[see article reprinted in full, elsewhere in this issue —*ed.*]

January 1993

• *Board Meeting, Nov. 23, 1992*—"…A brief discussion of overseas mailing costs, to the British Museum of Natural History and the Alberta Palaeontological Society, [resulted] in a board decision to continue these mailings for their prestige value." [*so there! —ed.*]

• *Mythology in Paleontology,* By Andrew A. Hay—an astonishing list of fossils named after mythological figures. [one error here—*Semele,* named for the mother of Dionysus, is a pelecypod, not a gastropod —*ed.*]

February 1993

• *Oldest Fossils Discovered at Empire* By Arnold Mulzer—reports on the discovery of 2.1 to 2.2 billion year-old algal filaments discovered in iron-ore at a mine in Empire, Illinois.

• *Why Not the Mammals?* By Allen A. Debus —first of a two-part, illustrated article on the historical development of scientific interest in extinct mammals.

Fossil Trails—Alberta Federation of Rock Clubs

October 1992

• A 125-page biography of the late Lawrence Halmrast, Alberta fossil collector, is expected to be published in December '92 or January '93. The cost is likely to be nominal. Contact:

Archeological Survey, Gov't of Alberta,
"Occasional Papers"
12845 102 Avenue,
Edmonton, Alberta T5N 0M6

MAPS Digest—Middle America Paleontology Society, Cedar Rapids, Iowa

December 1992

• *Letters to "How Does Your Fossil Club Operate?"*, by David Peters—A questionnaire was sent to a number of fossil clubs in the U.S. requesting information on how officers/new board members were attracted, types of programs offered, fund-raising methods, etc. The responses were often thought-provoking…recommended reading for APS members.

• *Longest mastodon footprint track found in Michigan pasture* (Chicago Tribune)—reprint of an item on the discovery of a mastodon trackway up to 75 yards long, in what was once a shallow pond.

January 1993

• *Extraction of Microfossil Shark Fossils from a Highly Weathered Upper Pennsylvanian Marine Shale in Southwestern Pennsylvania,* by Alan L Saltsman—a method using vinegar and bleach for recovering phosphatic fossils.

Paleo Newsletter—Austin Paleontological Society, Austin, Texas

October 1992

• *The Zilker Park Dinosaur Tracks (continued),* by Joan Crane—Continuation of an article on dinosaur tracks in Texas, and aspects of the environment in which they were preserved.

• *Fossil Discovery a 'Once in a Lifetime Opportunity',* by Frank D. Roylance, Baltimore Evening Sun staff writer—A reprint of an article appearing in the Evening Sun newspaper of May 6, 1992, regarding the discovery at a highway construction site of a large number of Miocene mammal, marine vertebrate and invertebrate remains.

December 1992

• *The Zilker Park Dinosaur Tracks (continued),* by Joan Crane—apparently the last installment, as none appeared in the January 1993 issue. (Check the November 1992 issue as well).

• *Paleopathology,* by Tom Rein—a short but interesting article on the medical problems of extinct animals. ❑

Fossils in the News

The Calgary Sun, Aug. 28, 1992:
Dinosaur had lot of heart
London (Reuter)—A paper in the latest edition of the British medical journal *Lancet* has put forward the theory that the 200 million year-old dinosaur *Barosaurus*, which stood 13 metres tall, may have had eight hearts to pump blood to its head. The paper asserts that *Barosaurus* held its 10-metre neck aloft to graze on tree-tops; in order to accomplish this, a very powerful cardiovascular system would be needed. The authors postulate that *Barosaurus* had a primary heart in its thorax, a second heart at base of the neck, and three more pairs of hearts at intervals up the neck.

PRISCUM, newsletter of the Paleontological Society, Vol. 2, No. 2, Sept. 1992:
New volumes of *Treatise* to be published—Two new volumes of the *Treatise on Invertebrate Paleontology* were to be published in the fall of 1992, and should be available by time you read this. The volumes, titled: *Part R, Arthropoda 4, Volumes 3 & 4: Superclass Hexapoda ,* by Frank M. Carpenter, will deal primarily with insects. Price was to be announced. To order, contact the Geological Society of America, Publication Sales, P.O. Box 9140, Boulder CO, USA 80301-9140, phone (303) 447-2020.

An article elsewhere in this newsletter updates general progress on the *Treatise:*

• The *Treatise* project appears to be on a firm financial footing.

• Volumes on Cretaceous ammonoids, Paleozoic ammonoids, and the introduction to trilobites are nearing completion, with work on brachiopods and Paleozoic ostracodes following close behind.

• Progress is being made on several groups of the Protista, including benthic, calcareous algae; the sponges; some Bryozoa; an introduction to the ammonoids, and volumes on Triassic and Jurassic ammonoids; the coleoids (squids, belemnites); the post-Paleozoic ostracodes; and several volumes on trilobites.

• Revisions of the scleractinian corals and nautiloids are just beginning.

• The long-awaited coverage of the Caenogastropoda (Part J), and a revision of the Stromatoporoidea (Part E) will be incorporated in a new *Treatise* project called "**PaleoBank**", a computerized data-base version of the *Treatise.* It is hoped that the project will speed completion of new volumes, and provide more up-to-date data for palaeontologists.

The gastropod and stromatoporoid pilot-projects are said to be "moving ahead deliberately."

The Calgary Herald, Sept. 11 1992:
Rare dinosaur find exciting
By Mark Lowey (Herald writer)—The skeleton—perhaps including the skull—of a 75 million year-old hadrosaur has been found on military land in southeastern Alberta by Dr. Philip Currie, head of dinosaur research at the Royal Tyrrell Museum of Palaeontology. The fossil was discovered accidentally while investigating unrelated bones reported by the military at CFB Suffield, north of Medicine Hat. "The neck's disappearing into the hillside…we have hopes that (the head) is there" said museum spokesman Dennis Braman, who added that "The military has been totally helpful." Tyrrell workers were to protect the skeleton with plaster prior to excavation next spring.

The Calgary Herald, Oct. 15, 1992:
Was it one big bang or a series of nudges? Drilling project may help explain what happened to the dinosaurs
By Mark Lowey (Herald Writer)—A team of scientists from the Geological Survey of Canada, The Royal Tyrrell Museum of Palaeontology and The University of Alberta has undertaken a project to drill five holes in various parts of western Canada, in order to recover cores of sediments deposited across the Cretaceous-Tertiary (K-T) boundary. Three holes, each 250 metres deep, will be drilled in the Cypress Hills of Alberta, Wood Mountain in southern Saskatchewan, and southern Manitoba's Turtle Mountain area. Two shallower, 50m-deep holes will be drilled adjacent to known outcrops of the K-T boundary deposits in Cypress Hills and Wood Mountain.

It is hoped that the recovered cores will provide a detailed history of geological and biological events occurring before, during and after the K-T boundary,and how these events differed across western Canada. As well, the scientists hope that the 250m Cypress Hills well will penetrate the Eagle Butte Structure, a possible meteorite impact site that could be related to other impact sites implicated in the extinction of the dinosaurs.

Upon completion of the holes, temperature probes will be installed in the well-bores to monitor heat flow values for at least a year, which should help researchers gain a better understanding of recent changes in the Earth's climate.

The Calgary Herald, Oct. 30, 1992:
It's cross between post and cuke
By Mark Lowey (Herald writer)—"It" is a new

type of stromatoporoid discovered in Upper Ordovician (440 million year-old) limestone at Top-of -the-World Provincial Park, in southeast British Columbia. The fossils, which look "like a cross between a weathered fence post and an English cucumber," were first found a few years ago by a Calgary hiker. Researchers from the Tyrrell Museum of Palaeontology and the Geological Survey of Canada have been studying and collecting specimens for the past three summers.

Dr. Paul Johnston of the Tyrrell Museum reports that "we have several varieties that are definitely new to science." The specimens are apparently some of the best ever found. Most of the fossils, which "range from small pieces to a large, trunk-like chunk 13 centimetres round and more than two metres long" are found lying on their sides in a two-kilometre area, but some have recently been found embedded vertically, in growth position.

[*This article ends with the statement: "*Stromatoporoids probably lived on Earth about 10 million years, before they went extinct during an Ice Age.*"…the reporter has his facts wrong here, as stromatoporoids became very important reef-building animals much later than this, in the Late Devonian Period—their total range was from Cambrian to Cretaceous (and possibly to Recent—the very similar group, sclerosponges, was discovered living in the Caribbean in the 1960s): the line should have begun "*This type of stromatoporoid…"

Harvey Negrich, the APS's curator, adds the following interesting notes to this story: The fossil site in question was originally found by Reg Fryling, the "Calgary hiker" of this article. Harvey accompanied Reg and Chris Fryling to the location in September 1981, where a number of specimens were collected. These were subsequently passed along to Mike Wilson, formerly of the University of Calgary, who in turn passed them to Dr. Johnston of the Tyrrell Museum. Dr. Johnston took up the task of trying to identify the creatures. They were at first thought to be a Beatricea*-like organism from the middle Ordovician, as described in Geological Survey of Canada Museum Bulletin No. 5 (Percy E. Raymond, 1914); however there has been some reluctance to place the creatures in this group, as they are much larger than those described in the GSC bulletin, though some of the interior structures are similar.*

Several of the new Top-of-the-World stromatoporoids were on exhibit at the Tyrrell Museum last fall—ed.]

The Globe and Mail, Nov. 7, 1992:
The death of the dinosaurs: A Canadian scientist finds the smoking gun By Wayne Campbell (Special to G & M) Ottawa—This article documents the work of Dr. Alan Hildebrand of the Geological Survey of Canada, who is claimed to have tied together all of the missing pieces in the puzzle of the extinction event at the K-T boundary. Bringing together such evidence as the now-famous iridium anomaly, shock-metamorphosed quartz grains, 'textites' [*sic*], Haitian ejecta deposits and Mexican core samples, Hildebrand is now confident that the huge Chicxulub crater in Mexico's Yucatan Peninsula, which has recently been dated to the time of the K-T boundary, is the impact site of the comet that is supposed to have wiped out the dinosaurs and "70% of animal life on earth."

The Edmonton Journal, Nov. 22, 1992:
New view on dinosaurs
Toronto—A recent discovery in Wyoming has revealed that the sauropod *Diplodocus* actually had a row of triangular spikes along the top of its tail, rather than being smoothly tapered, as previously thought. Palaeontologist Stephen A. Czerkas told the Society of Vertebrate Paleontology that the discovery would "open the floodgates for reinterpretation" of sauropods, including species like *Apatosaurus (=Brontosaurus).* "Now we're seeing that at least some sauropods really looked reptilian, as people think of reptiles, with spikes that remind you of very large iguanas." [*Heather Whitehead reported on the Society of Vertebrate Paleontology's Toronto meeting in last December's* Bulletin *—ed.*]

The Calgary Herald, Feb. 8, 1992:
Scientist hopes to settle dispute over tiny fossil By Ed Struzik (Edmonton Journal) Edmonton—Controversy has erupted over a tiny jaw fragment discovered in 1988 near Cochrane Alberta, just west of Calgary. Palæontologist Dr. Richard Fox of the University of Alberta has assigned the fossil, dubbed *Chronoperates paradoxus*, to the 'mammal-like reptiles' group, which supposedly went extinct some 160 million years ago in the Jurassic period.

The trouble is, the jaw fragment in question (little more than a centimetre in length) and four other teeth found nearby were recovered from Paleocene rocks only 60 million years old [*presumably Paskapoo/Porcupine Hills Formation —ed.*]. This would imply that the mammal-like reptiles actually survived much longer than originally thought, and that palæontologists have some-

how missed much of their evolutionary history.

As would be expected, several academics have cried foul—while all are apparently at a loss over what sort of animal the jaw and teeth might belong to, none is in agreement with Fox's assignment to the mammal-like reptiles.

The Globe and Mail, Jan. 6, 1993:
Most primitive dinosaur dug up
The Calgary Herald, Jan. 6, 1993:
T. Rex's early ancestor unearthed in Argentina
The Calgary Herald, Jan. 9, 1993:
'Illinois Jones' strikes dino gold

This flurry of articles appeared in January, mostly datelined Washington (AP)—Scientists are closer to identifying the common ancestor of all dinosaurs, thanks to a serendipitous discovery in Argentina. The discovery, documented in the January *National Geographic* and the January 7 issue of *Nature,* was made by a bored Argentine student chucking rocks at a dig site. Noticing a glint from the rock he was about to heave, the student took a second look and saw two teeth—the rock turned out to be a skull.

University of Chicago palæontologist Paul Sereno (the "Illinois Jones" of one headline) and his team spent the next three days excavating the rest of the skeleton, complete but for some tail bones. The 225 million year-old fossil, named *Eoraptor* ('dawn stealer'), is the oldest known member of the theropod group of dinosaurs, which includes *T. rex.* The animal was about one metre in length, had hollow bones and grasping, three-fingered forelimbs. Its more primitive traits include lack of a hinge-like jaw joint and the large pelvic bone characteristic of more modern species.

The Calgary Herald, Jan. 23, 1993:
Did the Earth move for you too, darling?

Edmonton (CP)—Royal Tyrrell Museum of Palæontology researcher Darren Tanke suggests that dinosaurs may have suffered broken bones and other injuries while engaged in mating. The huge bulk of these animals resulted in unsafe sex, according to Tanke: "…it should not come as a surprise that three tonnes of dinosaur resting on the tail of a female is going to cause some injury."

In related paleopathology studies, Tanke suggests that the reputation for combativeness long given to horned dinosaurs may be undeserved. After sorting through 30,000 bones of horned dinosaurs excavated near Grande Prairie, Alberta, little evidence of combat was seen. "We had a few broken ribs and bones from the lower part of the body. This hardly suggests anything remotely related to aggressive behaviour. Maybe they side-butted each other, as bison and giraffes do. But there is little indication they really got into it and did each other serious harm." ❑

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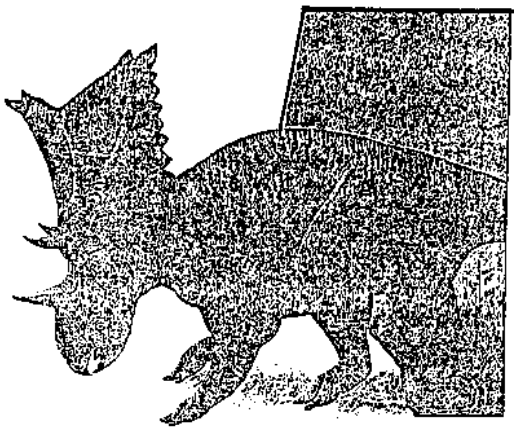

ALBERTA PALAEONTOLOGICAL SOCIETY
1993

Once again the Society is pleased to offer T-Shirts and Sweatshirts to its members. We are privileged to have an original colour drawing by Mike Skrepnick, a ceratopsian dinosaur on a province of Alberta background, for this offering. A black and white illustration appears above.

To order your T-Shirt or Sweatshirt fill out the order form below and mail to the Society as soon as possible.

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