ALBERTA • PALAEONTOLOGICAL • SOCIETY

BULLETIN

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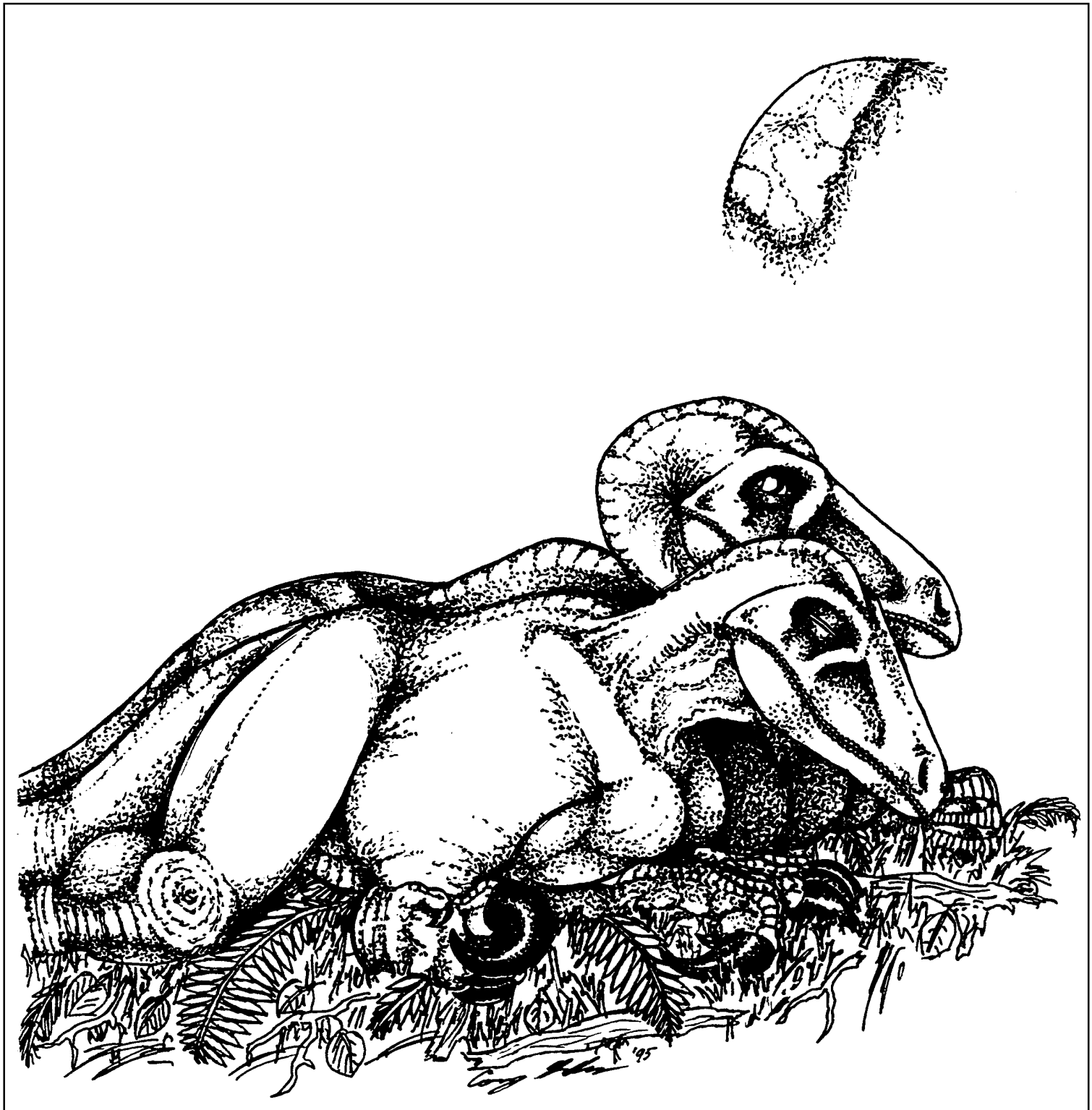

ALBERTA PALAEONTOLOGICAL SOCIETY

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. (Please enclose membership dues with your request for application.)

Single membership	$15.00 annually
Family or Institution	$20.00 annually

THE *BULLETIN* WILL BE PUBLISHED QUARTERLY: March, June, September and December.
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Requests for missing issues of the *Bulletin* should be addressed to the editor.

UPCOMING APS MEETINGS

Meetings take place at **7:30** p.m., in Room **B108**,
Mount Royal College: 4825 Richard Way SW, Calgary, Alberta

Friday, September 20—Our annual Show-and-Tell meeting: bring your latest finds from the summer collecting season—also, any photos or slides are welcome.
Friday, October 18—Cretaceous fossils of the Northwest Territories, with Holger Hartmaier.
Friday, November 15—Les Adler on "Classification, Cladistics and Dinosaurs."
Friday, December 20—Jurassic molluscs, with GSC Palaeontologist Dr. Terry Poulton. (Tentative)

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ON THE COVER: *Utahraptor ostrommaysi* pair (Early Cretaceous, USA). Art by APS member Cory Gross. ©1996. Reproduced by permission.

President's Message

by Wayne Braunberger

After that gruesome spring some nice weather finally appeared for the summer. Unfortunately our June field trip had to be rescheduled for this fall due to rain. However, our July and August field trips were very successful. Both these trips were well attended, particularly the July trip to Medicine Hat. Our intrepid field trip co-ordinator **Les Fazekas** did a mighty fine job in getting the trips organized for the year. **Ron and Sharon Stiem** of Medicine Hat are thanked for their hospitality. They were kind enough to take the group out to Red Rock Coulee both Saturday and Sunday and invited everyone over on Saturday night for a barbeque and to view their collection. I think that this was one of, if not *the* best field trip the Society has had.

I would like to welcome **Kris Vasudevan** to the Board of Directors. Kris has kindly taken on the position of Program Co-ordinator. Speaking of programs, the first meeting—Friday, September 20, will be our annual show-and-tell, so bring your finds from the summer.

For the upcoming year we would like to hold more seminars. Suggestions on topics as well as comments on last years' efforts would be appreciated. If a proper facility can be found, seminars on preparation and casting will be held.

I look forward to seeing you over the course of the winter and don't forget the show-and-tell meeting in September! ❑

Welcome New Members!

Geoffrey and June Barrett, Calgary, AB
Mike Bruggeman, Snellville, GA, USA
Terrill Gordon, Calgary, AB
Joyce Nakaska, Calgary, AB
Dave and Elsie Patmore, Devon, AB
Lorie Pierce, Calgary, AB
John Weber, Phoenix, AZ, USA

Don't miss the September show-and-tell meeting!
September 20, 7:30 PM

1996 Field Trip Reports

by Howard Allen

Waterton Dam, Alberta (June 22–23)

Our summer field season had a less than auspicious start. About a dozen members gathered at the appointed campsite near the Waterton Dam in southwestern Alberta, in a heavy rain. As the weather promised only to worsen, we decided to adjourn until September. [*See schedule, pg.3*]

So as not to waste the trip entirely, a majority of the participants proceeded to the Three Forks Rock and Fossil Museum, north of the Oldman River Dam, near Pincher Creek. The museum is owned by the Dwyers, a local couple who charge admission to view their extensive collection, housed in a small building adjacent to the family farmhouse. The proprietors have amassed (apparently in only a few years) an impressive collection of fossils from Alberta and around the world, as well as mineral specimens, lapidary items and other natural curiosities. We spent more than an hour marking the display windows with nose prints, and conversing with the owners, before returning to the unabated rain.

The gravel roads were by this time deteriorating rapidly, and most of the party wisely chose to return home via tarmac. The author, however, accompanied by passenger **Peter Meyer** chose to continue to Head-Smashed-In Buffalo Jump—via the euphemistically named Highway 785. This segment of the trip turned into high adventure, as the "highway" had been reduced to a brown, slippery streak smeared across the green landscape. After a half-hour of wallowing and slithering (in 4-wheel drive) through surprisingly deep pools of opaque water and rutted banks of axle-high mud, we emerged intact but much besmeared at the Head-Smashed-In Interpretive Centre, where we briefly toured the displays before returning home to Calgary.

Red Rock Coulee, Alberta (July 20–21)

Happily, our second trip was a complete success, taking place under blue—though windy—skies (this *is* southern Alberta!) and led by our most capable and hospitable guides, **Ron and Sharon Stiem** of Medicine Hat. A large contingent (thirty-one!) met at the site on Saturday morning and rapidly dispersed into the badlands which expose rocks of the upper Judith River Group and basal Bearpaw Formation (Upper Cretaceous: Campanian). The area comprises interbedded non-marine, bentonitic shales and sandstones with occasional ironstone and coaly layers, overlain by grey, marine to brackish-water shales

of the Bearpaw Formation.

Vertebrate (especially microvertebrate) fossils are abundant throughout the area, and participants were soon discovering an astonishing diversity of fossils, ranging from fish scales and teeth, through amphibian, crocodile and turtle remains, to bones and teeth of a variety of dinosaurs—large and small theropods, hadrosaurs, ankylosaurs and others. The invertebrate *aficionados* were not disappointed, as numerous brackish-water gastropods and pelecypods were to be seen weathering out of the basal shales of the Bearpaw Formation. **Alex Harich**, who is alleged to have attended the expedition (he must have been incognito: this reporter never laid eyes on him!) is alleged to have discovered most of a large *Placenticeras* ammonite.

Andy Godard had an encounter with a small rattlesnake, which ended in the accidental demise of the unlucky serpent. Spotting the snake just a second too late, Andy leapt up to avoid a strike (the varmint's fangs penetrated his jeans and socks—but not his skin), and in the scramble he came down on the snake, killing it.

Late in the afternoon, the group returned to Medicine Hat, then met at the Stiems' home for a barbecue. [*APS Field Trip Tip #1: if caught in Medicine Hat after 7:00 PM on a Saturday night without B.Y.O. barbecue meat, head directly to the Superstore at the mall on the east end of town—everything else is closed! –ed.*] The Stiems generously supplied us with corn-on-the-cob, delicious salads and excellent entertainment…in the form of their wonderful fossil collection and engaging discussions on things palaeontological.

Sunday was just as satisfying as the day before, as the Stiems directed us to another area of badlands just as rich in fossils. Another young rattlesnake was encountered early in the day, this one suffering no worse indignity than having to pose for unsolicited photographs.

After two full days of fruitful exploration and beautiful prairie weather, the group parted company tired but happy. I know I speak for all the attendees in thanking Sharon and Ron Stiem for a fun and educational weekend.

Genesee, Alberta (August 17–18)

Intrepid field trip leader **Les Fazekas**, still sporting a neck brace, led a group of 15 members on a 1.2 km. bushwhack to the bank of the North Saskatchewan River, northeast of Alsike, Alberta. This was the second official APS trip to the locality, which produces beautifully preserved Paleocene leaf fossils of the Paskapoo Formation.

The weather was cool, but mostly sunny as participants spread out and began splitting the loose slabs of light grey shale containing leaf fossils. The riverbank is slumped and mostly overgrown at this locality; very little fresh exposure can be seen. However, numerous slabs and blocks of the fossil-bearing shale have weathered out of the slumped material, and are easily split to reveal their contents. The shale is richly fossiliferous, and very few slabs are found that do not contain at least a few leaf fragments. The most abundant fossils were leaves of the broadleafed *Cercidiphyllum* sp. (Katsura tree) and possibly *Platanus* sp. (Sycamore/plane tree); and the coniferous Dawn Redwood, *Metasequoia occidentalis.* Other species, including fragments of cat-tail (*Typha* sp.) leaves, and several as yet unidentified broadleaved species were collected. Les Fazekas found an unidentified insect fossil.

Although mosquitos were scarce, the group had to be wary of two large, paper wasps' nests suspended in the trees—**Harvey Negrich** and **Wayne Braunberger** sustained stings. By mid afternoon, our packs were well-loaded with specimens, and we headed back into the brush, emerging at the vehicles perspiring, muddy and bush-worn, but with all present-and-accounted-for, and content with our day's adventure. ❑

Field Trip 96-1: Saturday & Sunday, September 28–29

Waterton Dam and area, Alberta —rescheduled from last June

Coordinator for this trip is Wayne Braunberger, (403) 278-5154

Saturday: This day will be spent measuring the Bearpaw/Blood Reserve formations that crop out below the dam. As this is part of the Field Methods seminars, a small fee ($2.50) will be assessed to those who did not attend the previous seminars to cover the cost of handouts. Any fossils collected from this section will be retained for the Society collection.

Sunday: A normal APS field trip will be run. At this time it is intended to visit one or two other sites in the area.

Meeting place: At 10:00 AM on both days meet at the west end of the Waterton Dam. From Pincher Creek, drive south 18 km. on Highway 6, then east 16 km. on Secondary Road 505 to the dam. **Allow at least 3.5 hours driving time from Calgary**.

Potential hazards: Waterton River, steep slopes.

Clothing and equipment: sunblock, hats, rainwear, mosquito repellent, water, sturdy hiking shoes or boots, food. ❑

Digging dinosaurs with BYU

by Vaclav Marsovsky

My wife Mona and I volunteered with Brigham Young University this summer as part of the excavation program at the Dalton Well Dinosaur Quarry near Moab, Utah. The BYU Earth Science Museum chose Dalton Well over their Dry Mesa, Colorado quarry this summer in order to study the early Cretaceous dinosaurs of North America. Apparently exposures with fossils from this age are rare in North America.

The fossil layer is in the Cedar Mountain Formation, which is approximately 140 million years old. It lies directly above the identical-looking Morrison Formation; where one formation stops and the other begins is truly in the realm of experts. The green clay holding the fossils is buried under a thick layer of tan-coloured sandstone. We were grateful that Jim Jensen many years ago removed the sandstone with a bulldozer and built a road up to the site, located at the edge of a mesa. The cleared site is about 5m by 40m but only about half of it has been worked to the bone bed layer. The bone bed disappears under the overburden and probably goes on for quite a distance into the mesa.

The fossil bone occurs in a green clay which is fairly soft and can be removed with an awl. There were colourful rounded rock cobbles that looked like gastroliths in the clay but probably were not the real thing. They must have come from far away, as there are no rocks of this kind in this area of Utah. Lower down in the bone bed, the bones occur in a dark brown to purple rock layer from which they are virtually indistinguishable. It took at least half a day for us to learn to recognize bone versus rock. Even the cancellous (cell-like) bone structure doesn't provide clues, as the pores of these bones were filled with minerals that look like the adjacent rock. Bones were not articulated; many were broken and incomplete. We were disappointed several times in pursuing what looked like a very nice specimen into the bank only to find that it suddenly ended. Bones lying directly on top of the hard layer were difficult to remove since it was impossible to "pedestal" them prior to jacketing. Elements were difficult to recognize by all workers, not just us.

While speculation on dinosaur genera was discussed at the site, I will avoid the use of names, as it may be premature. We did find spoon-shaped sauropod teeth, theropod teeth, big limb bones from a large dinosaur and smooth oval scutes. Much of the material was the remains of vertebrae—mainly the centra, but also some neural arches.

Should anyone be interested in volunteering with the BYU program, I can provide some information. ❑

Fossils in the News

New Scientist, May 25, 1996:

How to give a dinosaur the hump

By Jeff Hecht, Boston—Palaeontologist Jack Bowman Bailey of Western Illinois University argues that some of the supposedly sail-backed dinosaurs, like the carnivorous *Spinosaurus* (whose only known fossils were destroyed in World War II) and the herbivorous *Ouranosaurus* were more likely hump-backed. Citing numerous attachment points for ossified tendons and the relative size of the dorsal spines versus the vertebrae, Bailey maintains that the animals, both from the Cretaceous of Africa, had humps, much like the modern bison. He speculates that the humps may have been fat stores, to insulate the dinosaurs from overheating, or as energy reserves during long migrations across barren lands.

The Globe and Mail, June 20, 1996:

Oldest tyrannosaur found in Thai jungle

NEW YORK (AP)—Bones attributed to the oldest known tyrannosaur have been found in a stream bed in Thailand. Palaeontologist Eric Buffetaut of Paris says the animal, named *Siamotyrannus isanensis*, measured 6.4 metres from nose to tail, about half the size of *T. rex.* The fossils were found in rocks dated at 120 to 130 million years old, at least 20 million years older than the earliest previously-known tyrannosaur. The find bolsters theories that the tyrannosaur lineage had its origins in Asia and spread via a land bridge to North America.

The Calgary Sun, August 6, 1996:

Dinosaur diviner

SALT LAKE CITY (AP)—Ray Jones, a University of Utah radiation analyst, handyman and amateur palaeontologist has invented a gizmo for detecting faint amounts of radiation given off by dinosaur bones underground, and used the device to find two skeletons of Early Cretaceous herbivorous dinosaurs. Jones' instrument detects bones through rock up to a metre thick.

Subsequent excavation at a third site, at Dinosaur National Monument, turned up the skull of a new carnivorous dinosaur at a spot also pinpointed by Jones' "radiological surveyor."

Alberta Report, July 15, 1996:

A reptile with a beak

DRUMHELLER—This is one of a flurry of articles that appeared this summer documenting the discovery that an ornithomimid dinosaur skeleton excavated last year in Dinosaur Provincial Park shows the remains of a beak. This fact has relevance to the theory that birds evolved directly from dinosaurs. The skeleton was discovered last summer by Dennis Braman and Kevin Aulenback, of the Tyrrell Museum, while excavating for plant fossils [*Bulletin, Sept. 95*]. Phil Currie and other scientists had suspected that ornithomimids might have beaks, since they were toothless, and had a delicate facial structure that seemed like it should be protected by a beak of some kind. The present specimen shows an outline of the beak—probably originally of keratin, like fingernails and modern ducks' bills—as a dark stain on the sandstone matrix. It is hoped that the skeleton will be ready for display by the Labour-Day long weekend.

Science, May 24, 1996:

Mammal Diversity takes a 20-million year leap backwards

Fossil evidence for a Late Cretaceous Origin of "Hoofed" Mammals

Two articles, the first a semi-popular account, the second an academic paper, document the discovery of a possible Late Cretaceous ancestor of a number of living and extinct mammal orders, including the ungulates (hoofed mammals) and the elephants. The fossils, of five different species of rat-sized animals from Uzbekistan in western Asia, show that the mammals had a much higher diversity in the Late Cretaceous than previously suspected.

Oceanic anoxia and the End Permian mass extinction

This, a third item of palaeontological interest in the May 24 *Science*, is an academic paper describing studies undertaken on Late Permian/ Early Triassic rocks in Europe, showing evidence that the oceanic waters of this time may have been very anoxic (stagnant; without oxygen), even at relatively shallow depths. Geological and isotope studies suggest that this might have been a major factor in the biggest extinction event known. ❑

[*Thanks to Vaclav Marsovsky and Sam Richter for providing clippings –ed.*]

Reviews

Jurassic Frog Hops into the Record Books *National Geographic*, August 1996, p. x (Geographica).

Greg Harlin provides a picture of *Prosolirus bitis*—with its enclosed skeleton, a composite of five partial skeletons, each less than three inches long. The bones were recovered from Jurassic sediments in Arizona by Neil Shubin of the University of Pennsylvania and Farish A Jenkins, Jr. of Harvard University in 1983. The specimens have only recently been recognized as frogs. These skeletons are the oldest known frog specimens to date, being 190 million years old, about 15 million years older than an Argentinean specimen. *–Les Adler*

Case Closed *Scientific American*, August 1996, p. 22.

Kristin Leutwyler reports that the initials M.A.C.H. have been found on stained specimens similar to the Piltdown hoax specimens at London's Natural History Museum. They are believed to belong to Martin A.C. Hinton who warred with Smith Woodward, Keeper of Palaeontology, over wages. *– Les Adler*

This View of Life: A Lesson from the Old Masters by Stephen Jay Gould. *Natural History*, August 1996, p. 16–22, 58, 59, with illustrations.

Today we are familiar with camels that have one or two humps, but today's deer do not have humps. Large deer with big antlers, particularly moose, often develop a broadly raised area on their backs in the shoulder region where forelegs meet backbone. But the deer with the largest antlers of all time—the extinct and misnamed Irish elk—did evolve a prominent hump. We know this from the paintings of these giant deer by palaeolithic artists on cave walls in France.

This animal was not exclusively Irish nor an elk. It ranged from about 400,000 years ago to 10,600 years ago across Europe and some other continents. Several complete skeletons have been preserved beneath layers of peat in Irish bogs. Stephen quotes two or three articles and calls *Megaloceros* the "giant deer." He discusses the facts of its extinction and human interaction, proven by the paintings.

Occasionally the soft parts of animals are fossilized as in the Burgess Shale of British Columbia. In Germany the feathers of *Archaeopteryx* were preserved in the Solenhofen

limestone. In Alberta skin impressions of dinosaurs are preserved. In this case artists preserved the hump of the giant deer. Valerius Geist of the University of Calgary deduced the diet of the giant deer from the size of its antlers and consequently was able to find willow remains stuck in deer fossils' teeth.

Stephen then discusses the compensatory adaptations resulting from the giant deer's hump and also the colours used by the artists. The original cause for the hump was probably an effect of the underlying dorsal spines; later the hump developed complex adaptive functions.

Similar examples include feathers as thermoregulatory devices in small running dinosaurs being co-opted for flight in birds; brains in our australopithecine ancestors, needed on African savannas, being co-opted by Cro-Magnon man for artistic expression and utility so that we in turn could learn about the co-opted structure of the giant deer's hump.

Our ancestors have provided us with a wondrous preservation of the hump in the giant deer—a true item of earthly beauty.

–Les Adler

This Land/Colorado: Shale Tales by Robert H. Mohlenbrock. *Natural History*, August 1996, p. 61–63, with illustrations and maps.

Dr. Mohlenbrock, professor emeritus of plant biology at Southern Illinois University, Carbondale, explores the biological and geological highlights of the US National Forests and other park lands. This article features Florissant Fossil Beds National Monument, 8,500 feet above sea level southwest of Denver on Highway 24 west of Colorado Springs and 12 miles from Pike's Peak. 35 million years ago the forests consisted of white cedar, pine, palm, maple, hickory and members of the beech and elm families. Redwood trees grew along the streams. Animals included oreodonts, brontotheres and a horse ancestor. Volcanic eruptions brought massive mud flows which preserved tree trunks and dammed a stream forming the ancient Lake Florissant. The bodies of fish, insects and leaves were preserved in the fine volcanic ash. The national monument established in 1996 protects more than 1100 kinds of fossil insects, 16 types of vertebrates and about 150 species of fossil plants. In addition to the fossils the area provides the opportunity to observe a wide range of modern plants.

The Quon family, of Calgary (APS members), visited the Florissant Fossil beds a few years ago, and might be able to provide information for those wishing to visit the area.

–Les Adler

The Mother of Mass Extinctions by Douglas H. Erwin. *Scientific American*, July 1996, p. 73–78.

The new look that *Scientific American* magazine has been sporting of late brings a more "reader-friendly" format to the journal that was a staple of my university years. More illustrations (especially colour ones); short, punchy news bites and humorous columns with clever headlines (witness the title of this article) are scattered around the magazine. There also appears to have been an effort to reduce the amount of scientific jargon and to generally simplify the writing, presumably to appeal to a wider cross-section of the public, in the vein of competing magazines like *Discover*, *Natural History, Earth* and *Omni* (well...maybe not in the vein of *Omni...*).

The old *Scientific American*, though not a strictly refereed academic journal, nonetheless had a reputation for editorial rigour which was one reason my professors regularly assigned readings from *S.A.* offprints—you were confident of getting good, solid science in a readable format.

Unfortunately, with the last couple of issues I've read, I've sometimes had the uneasy feeling that the old editorial sharpness is starting to slip; I hope I'm wrong. Maybe I've become a more critical reader, or maybe I'm just getting cranky in my old age; but *The Mother of Mass Extinctions* had me muttering "huh?" aloud several times, and rereading passages to see if I'd missed something.

The subject of the article is, of course, the end-of-Permian extinction, an ecological catastrophe that truly deserves Erwin's title. I approached the article expecting a fairly standard review of the topic, with perhaps some new findings thrown in to shed light on this major "whodunit" of palaeontology. What I found amidst the colour diagrams and yummy fossil pics was a lot of gaping holes and inconsistencies that for me served only to obfuscate the mystery even more.

The first half of the article summarizes the extent of the biological crisis that marked the end of the Palaeozoic era. An estimated 80 to 95 percent of all Late Permian species had been exterminated by the dawn of Triassic time. Some researchers contend that there were actually two main extinction events, a smaller one at the end of the Middle Permian and a big one at the end of the Late Permian. Studies are beginning to suggest that the final Permian event happened much more rapidly than some workers previously believed. Erwin admits that his earlier estimate of a five to ten-million-year long event may have to be shortened to less than one million years. The end-Permian extinction events appear to coincide roughly with major volcanic events in Siberia and in China, as well as with apparent anoxia (oxygen depletion) of the Permian oceans, and major sea-

level fluctuations. So far so good.

It is in the last half of Erwin's article, wherein he attempts to draw correlations between the geological and ecological events and to formulate possible explanations that things start to get shaky. My first complaint is, admittedly, relatively niggling: Erwin notes recent studies that show an increased ratio in late Permian rocks of the lighter carbon isotope C12 relative to the heavier C13. He then offers a possible explanation: "This fact indicates that, apparently, more organic matter was being buried during the late Permian than in previous times." (He doesn't explain this idea, but presumably organic matter contains a relatively higher proportion of the C12 isotope, so burying more organic matter increases the ratio in the sediments that were tested.)

This burial of organics idea is an *interpretation* of the *evidence* that C12/C13 ratios are increasing. There might be other interpretations of the evidence. But Erwin follows immediately by stating: "Although this burial of carbon is telling us something about geochemical changes during the end-Permian extinction, it is not entirely clear what." Here he has made a leap by turning the burial of organics *interpretation* into an evident *fact.* This sort of logic is dangerous, building a house-of-cards with the rest of his elaborate argument…if the changing C12/C13 ratio turns out to have been caused by something other than burial of organic matter, then his whole argument collapses. Like I said, this is a niggling complaint —with so few facts to work with, most explanations are bound to be card-houses; but Erwin might have qualified his statements a bit more.

In any case, this idea of increased burial of carbon appears to conflict with a later statement that "…greater erosion and oxidation occurred. This oxidation reduced the oxygen and increased the carbon dioxide in the atmosphere…" Apparently, at the same time that more carbon is being buried, more carbon is also being released into the atmosphere. It is unclear how these two ideas are reconciled.

As his argument continues, Erwin seems to be groping. He suggests: "It [burial of organic carbon] may have to do with the sudden, deadly drop in sea level" (a global, Permian event he noted earlier in the article), but he doesn't suggest how the two might be related. Later, he states: "…near the end of the Permian, the sea level fell. (No one knows exactly why, but it may have been caused by changes in the earth's mantle that enlarged the ocean basins.)" This startling idea is also left unexplained: what "changes in the earth's mantle" could cause such a major enlargement of the ocean basins? The attentive reader will remember from earlier in the article that 1.5 million cubic kilometres of lava—a hell of a lot—was erupted onto the Siberian landscape. There were also the large eruptions that deposited quantities of ash in southern China. All that magma and ash had to come from somewhere, presumably the mantle; maybe the overlying crust collapsed as the magma was squeezed out, causing an increase in the depth of the ocean basins…? But no, that can't be, because Erwin's later chronology suggests that the first phase of the extinction event "began with the drop in sea level…" followed by phase two, the volcanic eruptions. This leaves the cause of the sea-level drop unaddressed, except for his invocation of mysterious "changes in the earth's mantle."

Conspicuous by its absence is any mention of glaciation, which might account for a sudden (tens to hundreds of thousands of years) drop in sea-level and also the sudden, subsequent rise in sea level "perhaps several hundred thousand years later." The evidence for glaciation at the end of the Permian and its possible implications have been discussed in earlier works (for example, see Stanley's book, listed at the end of this review). If Erwin discounts glaciation, should he not at least have mentioned the idea? It's not an unreasonable hypothesis for rapid sea-level fluctuations and has existed in the public eye for more than a decade.

I also have a problem with Erwin's contention that much shallow marine and near-shore terrestrial life was wiped out by "the rise in sea level and subsequent floods of possibly anoxic [oxygen-poor] waters at the very end of the Permian and into the early Triassic…It destroyed near-shore terrestrial habitats and contributed to the extinction of many surviving taxa."

Just what does he mean by "floods"? I can buy a relatively rapid rise in sea level (in hundreds or thousands of years at best—he doesn't offer any suggestion of a more cataclysmic rate); but I can't see how these advancing waters could remain anoxic enough (assuming they were to begin with) to kill many organisms. Would not the advancing water be subject to agitation by waves and tides? The fastest reasonable rate of rise would be a few millimetres or centimetres per year, which would allow more than enough time for re-oxygenation at the surface.

The last section of the article, particularly the last paragraph, is *really* bizarre. The reader initially gets the feeling that Erwin (curator of the Burgess Shale collection at the Smithsonian Institution) is leaving open the possibility of Stephen Jay Gould's contingency/lottery concept, with such remarks as: "…it was the bad luck of the exquisite Permian faunas…" and "…[it is uncertain] whether species that made it successfully out of the Permian had specific adaptations

that enabled them to survive or whether their survival was more random." But then, he ends with the completely anti-Gouldian musing that "Children would have grown up learning about crinoids and brachiopods instead of starfish and sea urchins, perhaps even looking in pools to catch a fleeting glimpse of a passing trilobite." What children? Human children? (Apparently; after all, he *is* aiming his article at humans!)

Is this just a picturesque wind-up for a popular magazine article—at the expense of good judgement—or does Erwin really suppose that there would be any children around to learn about anything? After emphasizing the profound changes that the Permian extinctions had on subsequent life, he seems to be comfortable with the idea of humans being just as we are, even if the extinction events had never occurred! Apparently Erwin has no problem with the old idea of us predestined humans climbing the "ladder of progress" with nothing blocking our way. A wonderful life, indeed!

– Howard Allen

Additional reading:

Stanley, Steven M. 1987. *Extinction*. Scientific American Library, W.H. Freeman and Company, New York. 242 p., ISBN 0-7167-5014-7. ❑

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.

Paleo Newsletter—Austin Paleontological Society, Austin, Texas.

July 1996

• *North American Paleontological Conference*—a review of the proceedings.

May 1996

• *The Eye for the Important Fossil*—keeping an eye open for significant scientific discoveries.

• *Brachiopods*—a short primer on the major groups, with illustrations.

June 1996

• *Trilobites*—a beginner's guide

British Columbia Paleontological Alliance Newsletter

June 1996

• *From Blastoids to Trilobites*—the first recorded trilobite fossil from Vancouver Island, plus a small fissiculate blastoid.

• *The Ammonites' Realm*—a discussion of the nautiloids, cousins of the ammonites.

• Desmatochelys: *a Cretaceous Marine Turtle of the North West Coast*

• *Cambrian Monsters Change Shapes*—a revision of the weird wonder *Anomalocaris.*

• *Tourists can Dig Fossils and More in Republic*–Collector's guide to the Washington fossil beds.

• *Finding and Preparing Upper Cretaceous Sharks' Teeth*

February 1996

• *Permian Fossils from Kamloops: Lost Treasures, and Secrets Revealed*—report on a variety of marine fossils.

• *Behaviour of some Eocene Insects*—from McAbee, B.C.

• *Fresh Fossils*—new discoveries in B.C.

Are you online?

I'm interested in learning how many members have e-mail addresses or personal web pages. If there is enough interest, an online members directory may be included in a future issue. If you have an e-mail address, please drop me a line at

75272.1316@compuserve.com

– Howard Allen, editor

APS MEMBERSHIP LIST September 1996

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