

BONE DIGGERS

Ice Age Paleontology at The Provincial Museum of Alberta



December 14, 2002 — March 9, 2003

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The Provincial Museum spotlights Bone Diggers in new exhibition

Edmonton – **Bone Diggers** is the first exhibition in a new series at the Provincial Museum of Alberta that shines a spotlight on Museum curators and their collections. **Bone Diggers** features the work of the Quaternary Paleontology Program staff and fossils from this period. The exhibition opens December 14, 2002 in the Museum's *Spotlight Gallery* and runs until March 9, 2003.

The Museum's bone diggers, Curator of Quaternary Paleontology Dr. Jim Burns and Paleontology Technician Peter Milot, are charged with collecting, studying and interpreting fossils from the Quaternary period of Alberta's past. Their collection contains over 30,000 pieces of fossilized bone and plant material.

An amazing assortment of birds and mammals, including camels and mammoths, once called Alberta home. A selection of the collection's most interesting fossils, hand-picked by Burns and Milot, will be displayed and interpreted in this first installment in the *Spotlight Gallery* series. Fossils displayed in **Bone Diggers** include a skeletal mount of a Giant Beaver, the bones of a Woolly Mammoth and an impressive fossilized lion jaw.

These discoveries were made through the painstaking process of finding and studying fossils that have been battered by two-kilometre thick ice sheets, rushing torrents of water and thousands of years of time. This is the realm of the Museum's bone diggers.

The Quaternary period is the 4th era of the geological time scale, encompassing the last two million years (including the present) and coinciding with the last great Ice Age.

The Museum houses 13 different curatorial programs and corresponding collections, which contain over two million artifacts. As space is at a premium, less than five percent of all the Museum's holdings are on public display at any given time. Each program is led by a curator and is supported by a number of staff and volunteers who manage the collections and conduct important research far removed from the public eye.

The *Spotlight Gallery* series of exhibitions interprets the story of Alberta and connects visitors with important pieces of our rich history.

The Provincial Museum of Alberta is located at 12845-102 Ave. Edmonton. For further information phone (780) 453-9100. Visit our Web site at www.pma.edmonton.ab.ca.

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Provincial Museum of Alberta

	Admission	Annual Mammoth Pass: (Unlimited Admission plus benefits)
Adult (18-64 years)	\$12	\$40
Senior (65 and over)	\$10	\$30
Student (with ID)	\$10	\$30
Youth (7-17)	\$6	\$30
Family (Two adults and children 7-17)	\$30	\$70
Grandparent (Two grandparents and children 7-17)	NA	\$60

Hours:

Saturday to Thursday: 9 am to 5 pm

Friday: 9 am to 9 pm

Admission is half-price on Saturdays and Sundays between 9 am & 11 am

Special Extended Holiday Hours:

December 26 to January 5: 9 am to 9 pm

December 31: 9 am to 5 pm

Closed December 24 and 25

The Museum Shop

Uncover great finds at the **Museum Shop** for *bone diggers* of any age:

- prehistoric jewellery, including reproduction pewter dinosaur teeth and ammonite pendants
- ancient fossils, from sharks' teeth to brachiopods
- expedition dig kits (unearth *ancient creatures!*)
- paleontology books for adults and kids



Exhibition Overview

The **Bone Diggers** exhibition is a celebration of Ice Age paleontology and the people who unearth and interpret Alberta's rich past. **Bone Diggers** features over 50 artifacts in a 1000-square-foot gallery.

Look at all the neat stuff we discover. Imagination is a plus in this profession. We're working with these grotty specimens, banged around by the forces of nature, and presented to us as if they had come out of a gravel crusher (well actually, some have done that!). You have to try to imagine what they represent and figure out how they got here and how the animals that they represent lived. Detective stuff is très cool, man!

– Curator of Quaternary Paleontology Dr. Jim Burns

Features of the gallery:



- a mini-diorama includes a skeletal mount of a Giant Beaver set beside a skeletal mount of a recent Canadian Beaver. Although no Giant Beaver remains are known from Alberta, we have every reason to believe we'll find some. These mounts are presented in a suggestive wetland environment, as they were likely similarly adapted to wetlands, building lodges and dams.



- a mini-diorama featuring a spread of bones of a Woolly Mammoth, presented as they might have been found near Edmonton. It may well have represented a single, fully articulated animal but the ravages of time conspired against its survival intact.
- a potpourri of bones and teeth from about a dozen species of Ice Age mammals recovered in Alberta, accompanied by interesting stories. The artifacts include an impressive lion jaw that escaped the jaws of a gravel crusher by precious inches and a mammoth tooth that weighs 4.3 kilograms!
- a series of four computer-generated images on canvas (*giclées*), created by local artist Gregory Baker, that depict the animals and environment of central Alberta about 25 to 30 thousand years ago.

People stand in awe when I tell them that, here in Alberta—30,000 years ago—we had mastodons, horses, camels, lions, sloths, and a bear that was over 5 feet tall at the shoulder! It was a menagerie of mammoth proportions, that inspires the imagination every bit as much as the scaly reptiles of a much longer-gone era. Most of the large mammals of the Ice Age period have become extinct, but many of them also have smaller descendants living today (can you guess what they are?). There is an obvious link, too, to climate change in the aftermath of the great extinction event, at the end of the Ice Age, and in the process of recolonization of the land by plants and animals.

– Curator of Quaternary Paleontology Dr. Jim Burns

Paleovalley

A series of illustrations of the last Ice Age in North America by artist Gregory Baker, BFA are on display in the Spotlight Gallery during the **Bone Diggers** exhibition. These prints are quite special as the artist drew inspiration for his art from the work and experience of the Museum's Dr. Jim Burns. For purchase information, call (780) 439-8471 or visit www.paleovalley.com.



The Quaternary Paleontology Program

The story of Alberta begins long before the first humans walked on the prairies. The mandate of the Provincial Museum's Quaternary Paleontology Program is to study, interpret and protect Alberta's fossils, in particular fossils from the Quaternary period (encompassing roughly the last two million years and coinciding with the Great Ice Age). The collection consists of about 30,000 fossilized bone and plant specimens, and includes trace fossils, such as amber, footprints, burrows and droppings.

The program, originally known as Quaternary Vertebrate Paleontology, began in December 1983, with Dr. Jim Burns as its first and only curator. The 'Vertebrate' part of the title was removed as the bone diggers began collecting non-vertebrate (plant) material.

People are fascinated by the paleontologists' ability to assemble gigantic skeletons from minute pieces of fossilized bone. Indications are that, about 18,000 years ago, there was a two-kilometre thick ice sheet covering much of Alberta, applying crushing pressure on the bones it covered. As the glaciers began to recede, torrential waters further battered the fossils, pounding them against rocks and riverbanks.

As rivers continually cut deeper into the soil over time, fossils are generally found today in the layers of earth high up in the banks above the riverbeds. Cave sites in the Rocky Mountains have also yielded well-preserved fossil caches dating back over 20,000 years. Dr. Burn's work in these caves eventually became the basis for his doctoral studies.

The Dirty Work

The bone diggers often find themselves sifting for artifacts in the earth extracted by large machines in gravel pits. Gravel companies and other industries often unearth the fossils that were thinly distributed in the earth's strata by the advancement and recession of the ice sheet.

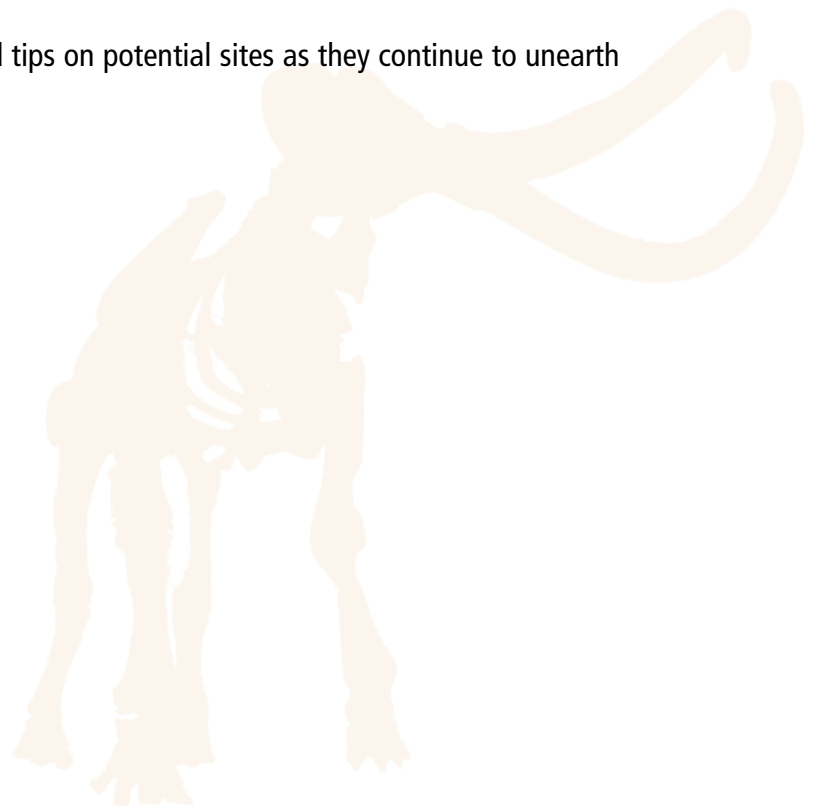
Gravel pits are notoriously dangerous places to work, with shards of rock flying through the air during extraction and the ever-present risk of a gravel bank collapsing in on the pit. The work requires attention to detail and safety, which means that the bone diggers leave their fedoras at home and don full safety equipment, including hardhat, goggles, ear protection, steel-toed boots and heavy coveralls. It is only with permission that they are allowed into the pits to collect.

When searching for fossils in areas other than gravel pits, the bone diggers are able to approach the excavation in a more traditional fashion, with picks, brushes and a lot of patience. To avoid the effects of the stifling summer sun, Jim and Peter start in the early morning in order to have a full day's work done by 1 pm. Not surprisingly, much of the fieldwork is completed in the months without snow.

As it is extremely rare to find fossilized skeletons intact, it would seem that the bone diggers have their work cut out for them in identifying and reassembling skeletal structures. According to Jim, some bone samples are so unique, it is relatively easy for an experienced paleontologist to determine exactly how they had fit into an animal's skeleton by examining even the tiniest of fragments.

People lucky enough to stumble across fossils while hiking through the badlands often bring their finds in for Jim and Peter to examine. Although it is important for paleontologists to have access to fossils for study, much of the story and context of the piece is lost when it is removed from its exact resting place. The fossil's position in the earth's strata and proximity to other fossils provides important information used by the bone diggers to piece together the past.

Jim and Peter welcome questions about artifacts and tips on potential sites as they continue to unearth Alberta's prehistoric past.



DR. JIM BURNS, *Curator of Quaternary Paleontology*

As the Provincial Museum's Curator of Quaternary Paleontology, Dr. Jim Burns is a detective of sorts, digging for clues to better understand the life this land sustained before history itself began.

Jim describes himself as a very hands-on professional who enjoys his time spent in the field uncovering Alberta's prehistoric stories. His work as a paleontologist is complemented by his training in zoology, botany and geology. Whereas some paleontologists work in the theoretical realm, speculating on prehistoric species' behaviour and biology, Jim is working to fill some of the gaps in our basic knowledge of prehistoric Alberta: What animals lived here? What are their patterns of distribution? Where did they come from? How did they get here?

Jim's area of expertise lies in Quaternary Paleontology: that is, with fossils from the Pleistocene Epoch, which began about 1.8 million years ago when world temperatures began cooling. Dinosaurs were long gone by this time, and an amazing assortment of birds and mammals, including camels and mammoths, made Alberta their home.

Jim originally hoped to follow family tradition and become a medical doctor. However, upon completing undergraduate work in Biology at the University of Western Ontario, he went on to study Physical Anthropology, and later Paleontology, for his advanced degrees at the University of Toronto. That's when Jim developed an "overpowering love and reverence for bones."

Jim has been with the Provincial Museum since 1983 and has no plans for hanging up his trowel. You can find him at the Museum by looking for the fellow with the dirty knees.

PETER MILOT, *Paleontology Technician*

When Peter Milot graduated from Calgary's Mount Royal College in 1978 with a degree in Communications and Media Broadcasting, he had no idea that he would one day be reconstructing the skeletal remains of prehistoric animals.

Shortly after graduation, Peter started working at the Glenbow Museum in Calgary in a program called Caravan Exhibits. Peter traveled to different communities, interpreting mobile exhibitions, and he developed a keen interest in Paleontology when the program featured an exhibition on dinosaurs. In 1987, after six years as a traveling interpreter, Peter applied and was hired for the job he still holds today.

Peter loves the sheer variety in his work, from unearthing fossils in the field and identifying his finds to creating the moulds and casts used to create replicas. Peter has mastered a number of techniques used in making replicas of fossils deemed too valuable to be put on display. Peter has also invented a process that adapts inexpensive caulking silicone into a general purpose moulding material, and it's the only known technique that may be used to create high-quality silicone rubber moulds from frozen materials. Peter is still refining the technique, which was warmly received when presented to the Society of Vertebrate Paleontology at the American Museum of Natural History a few years ago.

The results of Peter's work may be seen throughout the Museum's Natural History Gallery and in the dioramas in the Syncrude Gallery of Aboriginal Culture.

Q & A with Dr. Jim Burns

What is Quaternary Paleontology?

Paleontology is the study of fossils: teeth, bones, shells, wood, seeds, insects, etc. It even includes trace fossils such as amber, footprints, burrows and droppings. **Quaternary** refers to what we popularly call the Ice Age: the last 1.8 million years.

What has been the most exciting discovery of your career as the Museum's first Ice Age paleontologist?

Four years ago, the Province let the water out of the St Mary Reservoir, near Cardston, for repairs to the dam. The draw-down revealed an astounding wealth of Ice Age artifacts, specimens, and footprints. By far the most exciting experience for me was standing beside a trackway of nine consecutive Woolly Mammoth footprints, 11,000 years old. I closed my eyes and imagined the beast passing by. I could smell him; I could feel the vibrations in the ground; and the long, woolly coat brushed my face. Only the footprints remain, a replica of which can be seen in the Bone Diggers exhibition.

Is there a particular Ice Age fossil specimen that you would love to find?

There are several species that we have not yet found in Alberta, among which are the Giant Beaver, the Stag-Moose (it looks like a "cross" between an elk and a moose), and humans from before the last ice advance. I see no reason why humans should not have been here before 22,000 years ago.

But let's call a spade a shovel. My real dream is to find and excavate a complete and undisturbed mammoth skeleton. Ideally, there would be a rib or a pelvis with a perfect stone projectile point imbedded in it. Even better, the remains of the poor fellow who tried to kill it would be lying beside it, or perhaps under it, crushed by the falling beast!

When did the Quaternary Paleontology Program at the Museum begin?

I was hired to head up the program in December 1983. Previous to that, there was a program dealing with dinosaurs, but when the staff was preparing to move to Drumheller to open the Tyrrell Museum of Paleontology, the new program in Ice Age paleontology was inaugurated at the Provincial Museum here in Edmonton.

Did you acquire other collections to start the program?

The existing Ice Age collections were, indeed, scant in 1983. Dinosaurs dominated the paleontological scene, and few people thought the bones on river flats or in gravel pits were anything but dead livestock that had been dumped into the pits. Alas, not so!

I deposited more than 11,000 small vertebrate fossils, recovered from two cave sites in the Rocky Mountains of Alberta, in the Museum's collections when I arrived in 1983. The specimens had formed the basis of studies for my doctoral dissertation. My first field digs in the new job, during 1984-1987, netted us about 3000 specimens from several 25,000-year-old prairie dog sites near Drumheller. A major focus of the program has been to raise the visibility of the Ice Age fossil record in Alberta.

TOOLS OF THE TRADE



Fedora: Not just for the Indiana Jones look. Prevents nasty sunstroke.

Strong Rope: For those hard-to-reach locations.

Shovel: Otherwise known as a hand-held earth mover.

The Big Brown Bag: Usually contains measuring tapes, brushes, tweezers, string, baggies, markers and a hearty lunch.

Geological Pick: Used for making large pieces of rocks smaller. Important for scientific breakthroughs. (Get it? *Breakthroughs?*)