

ALBERTA REPORT

The money-hungry U of A
tries to discredit a widow's will

The W



Dinosaur revival

Drumheller's
Tyrrell Museum
brings 'em
back home

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A \$30-million dino shrine

The Tyrrell Museum of Paleontology is Alberta's gift to dinosaur lovers

Seventy-five million years ago, the air over south-central Alberta was warm and moist, the ground a boggy forest interspersed with lagoons, bayous, marshes, ponds and streams. Beneath magnolia, breadfruit and redwood trees were vine-entwined sycamores, cat-tails, water lilies, blankets of moss and swamp grass, flowers and rushes. Crawling amid the flora were tiny opossum-and shrew-like mammals, turtles, lizards, crocodiles; buzzing above were swarms of insects and birds. But most distinct in this teeming swampland were the dinosaurs, the hulking, fleshy, slothful plant-eaters and the bloodthirsty, bipedal carnivores (some no larger than a modern-day chicken) which as a group dominated the planet for over 100 million years and are now considered the most successful terrestrial animals ever to have lived.

Today the same region in Alberta, the Badlands, is dry as a bone. In place of marsh there is a scrambled assortment of dun-coloured sandstone coulees and buttes, weatherbeaten bluffs, ridges, ravines and hoodoos, punctuated by sage and cactus. Where there once loomed a great lizard 20 feet tall and weighing eight tons, there now lives a relatively unimpressive rattler, torpid under a cactus or a cottonwood, or maybe slithering through the dry grasses. But on the bank of the Red Deer River, which cut the Alberta Badlands a mere 14,000 years ago, is a new building to which the dinosaurs have returned. All three billion years of life on earth, and particularly the dinosaur-dominated Cretaceous period (130 million to 60 million years ago), have been compressed into 120,000 square feet of the Tyrrell Museum of Paleontology and a two-hour walking tour, at a cost of \$30 million.

Built over the past two years by the provincial government, the Tyrrell (named after the man who discovered dinosaurs in Alberta—see box) officially opens this week, becoming the first Canadian museum solely dedicated to paleontology (the study of ancient life). Its 31 complete dinosaur skeletons constitute the greatest collection in the world, edging out the 28 reconstructions at New York's American Museum of Natural History. Behind the bones are intricate murals portraying the beasts with "their clothes on," in their natural habitats as best as modern science can determine. There is a 3,700-

square-foot glass greenhouse with 110 different species of plant life known from the fossil record to have existed those many millions of years ago, including umbrella pines, sycamores, maidenhair trees and the dawn redwood (now indigenous only in China). Visitors are guided through the displays (which begin with the advent of



Assistant director Currie in a quarry Singlehandedly working a Badlands revival.

life on earth and proceed through the dinosaur age to modern man and a glimpse at the future) by dozens of video presentations, computer terminals, slide shows and demonstrations.

But the public show is only half of

The Cover

the Tyrrell. A solid portion of its \$2-million annual budget will be spent behind the spotlights and display cases in a world-class paleontological research centre staffed by experts in such diverse fields as sedimentology, paleobotany, palynol-

ogy (the study of ancient plant pollen and spores) and invertebrate and vertebrate paleontology. The facility is located four miles northwest of Drumheller (pop. 6,671) and about 60 road miles northeast of Calgary, amid one of the three major dinosaur excavation sites in the world (the Montana Badlands and Mongolia are the others), allowing researchers to walk out their back doors onto fields of bone fragments, fossils and occasionally full skeletons from which they'll piece together a more complete picture of dinosaurs, their habits and habitats. "The Tyrrell is sitting right on a treasure chest," boasts assistant registrar Jane Danis, 44. "We're right where the action is."

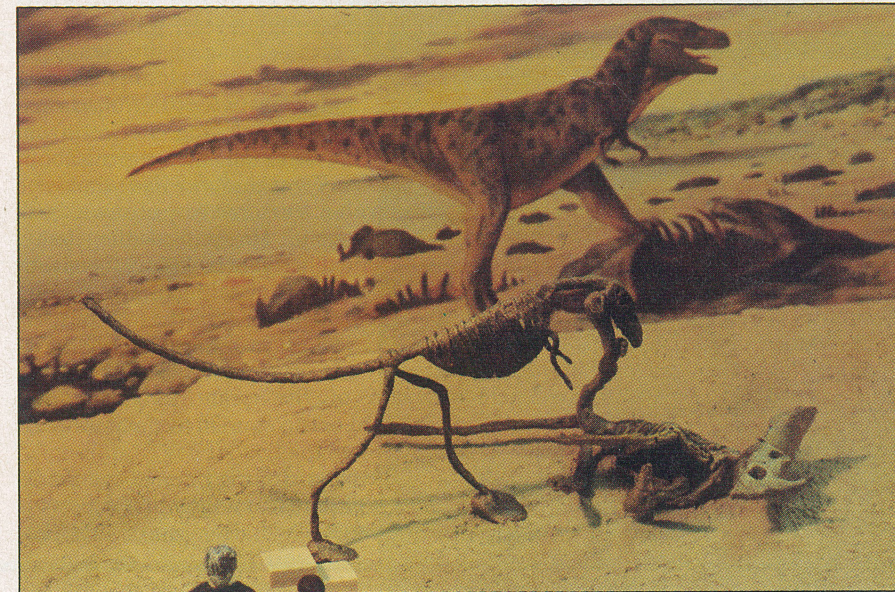
How quickly things change. Just over a hundred years ago, before the railroad and irrigation had changed the face of western Canada, the Badlands were an unmarked section of what was then being called the "Great American Desert." Their treasures were known only to the prairies' Blackfoot Indians who, on finding fossilized vertebrae up to 20 inches in circumference, thought they'd stumbled onto the graveyard of the grandfather of the buffalo.

Hudson's Bay Company fur trader Peter Fidler became the first white man on record to enter the Red Deer River valley in 1790. It would be another 70 years before Dr. James Hector of the Palliser Expedition undertook the second exploration of the region and sent reports on its vast coal reserves back to Ontario where they fueled the interest of the Canadian Geological Survey. In 1884 it sent a young geologist named Joseph Burr Tyrrell, then 24, to investigate. On his own initiative and in addition to his survey of the coal deposits, he discovered the first dinosaur bones in the region and accidentally found the first skull of the species which became known as *Albertosaurus*.

Various geologists and paleontologists subsequently made brief examina-

tions of bones and fossils in the Red Deer River valley, but it wasn't until 1910 that paleontology really got going. An Alberta rancher named John Wegener visited the American Museum of Natural History and casually remarked to an employee that its collection of dinosaur bones contained nothing more spectacular than the relics he tripped over every day on his spread near Trochu, 65 miles northeast of Calgary. His comment came at a crucial time in the history of modern dinosaur

1910 and in no time was hauling out tons of fossil and bone on a 12- by 30-foot flat-bottomed boat. "Box after box," he wrote, "was added to the collection until scarcely a cubit's space remained unoccupied on board our fossil ark." His harvest was transferred to boxcars and railed to his museum. News of his success spread quickly. Dr. Brown was joined shortly after his arrival in Alberta by the likes of William Cutler, a hard-drinking freelance collector who raked in up to \$6,000 for a



TYRRELL MUSEUM

studies.* Interest in the old bones was peaking and the demand for specimens at a burgeoning number of American museums and universities, cashing in on what was becoming a dinosaur fad, couldn't be met. So the American Museum dispatched bone-hunter Barnum Brown and the era now known as the Great Canadian Dinosaur Rush was on.

A native of Kansas and named after the renowned showman P.T. Barnum, Brown joined the New York museum in 1897 and eventually became its most famous and enigmatic collector. Some colleagues remember him as "grave, sometimes melancholy," and likened his personality to that of a Presbyterian minister. Others reported he was an accomplished ballroom dancer, a hit with the ladies and thrice-divorced. Whatever his style, his ability to sniff out dinosaur skeletons was legendary. In his later trips through the American West in the 1930s and '40s, he was referred to in the press simply as "Mr. Bones."

He reached the Red Deer River in

* Although dinosaur remains had been found in the early 1800s, no one was sure what they were until about 1850 when scientists began to put together clues more accurately. The first public displays of dinosaurs had been set up in London by that time and the great beasts remained a subject of curiosity well into the 20th century.



Albertosaurus and prey (top); the Tyrrell Museum of Paleontology A history of life on earth crammed into 120,000 square feet.

full skeleton in the starved American dinosaur market.

Canadians entered the hunt in earnest in 1912 when Charles H. Sternberg, another Kansan, was hired as chief collector for the vertebrate paleontology section of the Canadian Geological Survey. He and his sons, Levi, George and Charles Jr., journeyed to Drumheller and set up camp. Over the next few years, they collected a catalogue of specimens that rivalled Dr. Brown's and filled display cases in eastern

Canadian museums. Thirty of the 55 dinosaur species identified in Alberta were unearthed by the elder Sternberg, including the horn-nosed *Pachyrhinosaurus* now on display at Tyrrell.

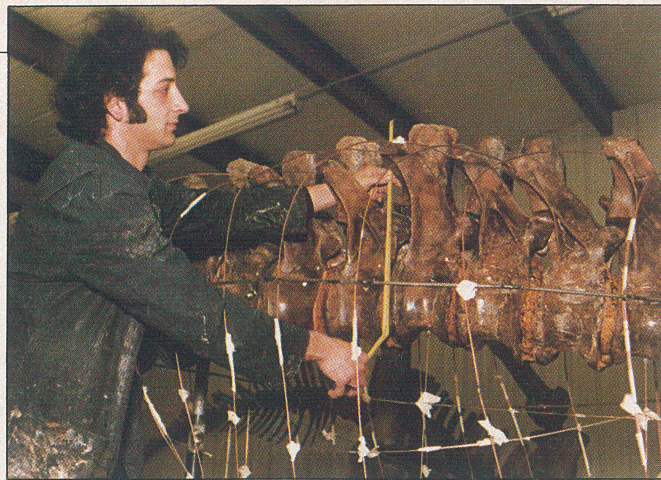
The bone rush continued until the late 1920s, when the Americans' funding lapsed, the elder Sternberg retired and his sons moved on to other careers in the same field. Before they finished, however, some 300 skeletons were removed from the area and shipped to 30 museums around the globe. No other region on earth of comparable size has yielded so many and such a variety of well-preserved dinosaur bones. To ensure that the treasure would not be further plundered, local residents managed to convince the province to declare part of the region a provincial park in the mid-1950s. Today, Alberta fossils can be excavated by permit only (fewer than 20 of these a year are handed out), and none can be removed from the province unless a specified number of duplicates exist. Anyone digging without a permit faces a fine of up to \$50,000 and a year in jail.

Tall, blond 34-year-old vertebrate specialist Dr. Philip Currie has been looting among the hills of Drumheller for almost a decade. A dinosaur freak since

SUSAN DEATON

carted off during the dinosaur rush. Small teams of researchers fielded by the museum for two months every summer since the early 1960s had made scant finds, so instead of opening new digs researchers had hitherto been concentrating on trying to retrieve Alberta specimens from museums around the world. Dr. Currie soon altered their approach.

He immediately began systematically exploring the richest fossil areas, reopened several quarries and established a volunteer program for summer digs. By the next year, the museum's staff had excavated their first dinosaur. In 1978 they found two more. In 1982 they dug up eight. Throughout those years the summer crews averaged a discovery of one new species (or at least a species new to Alberta) every year. Among those was the paddlefish, a four- or five-foot-long prehistoric fish that still lives in the Mississippi delta. Another was the plant-eating *Erlickosaurus*, previously found only in Mongolia. One hot afternoon in 1983, Dr. Currie, who had by that time been with the fledgling Tyrrell project for three years in the position of assistant director, was searching for fossils



Museum aide Don Watson and Tyrannosaurus Rex
The largest meat-eater ever to stalk the earth.

on a low bluff. He accidentally dropped his camera case, which rolled down the slope to a rest 30 feet below. He scrambled down to retrieve it, pushed aside some brush and bone on the hillside and within 30 minutes had identified two ilia, a scapula, a fibula, a femur, a sacrum and two vertebrae, all belonging to an *Albertosaurus*, the 12th ever discovered. "Anywhere you throw your hat down," he smiles, "there's such an embarrassment of riches." Museums and universities around the world have been so impressed with the work of Dr. Currie and his crews

four tons, *Tyrannosaurus* had a massive head with a fearsome row of saw-edged, six-inch teeth. He stalked the fleshy, slow-footed herbivores, killing them with his fanged jaws or taloned feet, gulping the soft meat and leaving the rest for scavengers. The *Albertosaurus* first discovered by Mr. Tyrrell in 1884 is a smaller version of the tyrant king, but still stretched out to over 30 feet and weighed up to three tons.

The most striking thing about the 55 species of dinosaurs dug up in Alberta is their variety and diversity of lifestyles.

enough to fuel the local economy. Thus city aldermen and Mayor William Doucette, 56, fought hard for the Tyrrell.

It was a tough fight. One site originally considered for the museum was Dinosaur Provincial Park at the southern extreme of the Badlands, 90 miles from Drumheller and only 25 miles from Brooks. The park is the richest fossil area in the Red Deer River valley, says Harvey Campbell, 55, chairman of Brooks' Dinosaur Park Task Force, "yet there's not even a place where a tourist can buy a cup of coffee. It's been terribly neglected considering the potential that's there. When you don't have anything to entice people to stay, the ones that come [40,000 a year] go away with a sour taste in their mouths." Mr. Campbell now concedes that his municipality was out-lobbied by Drumheller, but he hasn't given up hope of at least expanding a 75-site campground near the park. His task force was formed last year to that end. A \$1-million interpretive centre to be opened by the Tyrrell at Dinosaur Provincial Park next year has also salved Brooks' wounds.

Thanks to the lobbying efforts of Mayor Doucette and his council, Drumheller now stands to gain 60 permanent jobs and 267,000 more tourists annually. If each spends \$15, retail sales in the community will jump 7%. Those figures have excited a lot of people, but there are still sceptics. Gift shop owners don't think tourism will improve enough to allow them to stay open through the winter months. Adam Bodnarus, 52, general manager of the Drumheller Inn, home of the hoodoo burgers, says summer business was up 15% over last year because many tourists arrived thinking the museum had already opened. Still, the "backbone" of his business comes from visitors to the Drumheller Institution, and he's not counting on much change there. "Any tourists that come," he says, "are icing on the cake."

Susan Deaton and Kenneth Whyte

that they are now voluntarily returning specimens or making generous trades with the Tyrrell in hopes of cashing in on good relations when more and better bones are unearthed.

Perhaps the best-known of all dinosaurs found in Alberta or anywhere else is *Tyrannosaurus rex*, the largest land-dwelling meat-eater ever to roam the earth and one of very few animals commonly known by its scientific name, which literally means "king of the tyrant lizards." Standing some 20 feet high on two powerful, clawed legs, stretching 40 feet from nose to tail and weighing about

Humdrumheller

One expects to see Fred Flintstone and Barney Rubble, Wilma, Betty and bowling balls in tow, approaching the Drumheller Inn for a serving of pterodactyl eggs (any style), hoodoo hamburgers, "well-aged" dinosaur steaks and a mug of brontosaurus brew (green beer). Or they might cross the street to the gift shop to pick up a wooden, plastic, stuffed, brass, glass or inflatable dinosaur, or a dinosaur pin, button, ashtray, key chain, bookmark, sew-on badge, pencil sharpener, china set, spoon, earring, postcard, thimble, colouring book, dictionary or field guide. Or they might support one of the local businesses: Dinosaur Photo Services, Dinosaur Towing and Storage, Dinosaur Hotel, Dinosaur Trail Driving Range, Dino's Ready Mix or Dinny's Gas & Splash. But this is not Bedrock, it's Drumheller (pop. 6,671), 66 miles northeast of Calgary, a faded town hoping that its new Tyrrell Museum of Paleontology will make up for the oil boom it missed.

Throughout the 1970s and early '80s, while the oil-stoked provincial economy blossomed at a rate of 3% per year, Drumheller lagged behind at a meagre 1%. Until the 1950s it had been a thriving coal-mining town in which some 40 companies had operated since the beginning of the century. About the time steam locomotives gave way to diesel, however, the industry faded and Drumheller was relegated to the role of a trading and service hub for nearby farmers. Thanks to its dinosaur bones and proximity to Dinosaur Provincial Park, it is the province's third-largest tourist attraction, drawing about 100,000 a season, but still a distant third behind Jasper and Banff (two million and 3½ million respectively) and not

Some migrated as far as 2,000 miles a year. Others travelled from low coastal feeding grounds to mountain heights to breed and hatch their young. Some laid eggs; some are suspected to have borne live young. Some were cold-blooded, others warm-blooded. Some with large eyes at the front of their heads might have had three-dimensional vision. Some were capable of running at 50 miles per hour; others could barely hold their own bulk off the ground. There were whip-like tails, club-like tails, clawed feet, webbed feet, hooves, parrot-like beaks, duck bills, snapping jaws, saber teeth, and teeth that could not tear flesh but could grind plants.

Of the 500 major skeleton or skull finds in the history of the Badlands, almost 50% belong to the hadrosaur family: vegetarian, bipedal, duck-billed beasts, some of which reached 40 feet in length and weighed four tons. The various hadrosaur species probably had less equipment with which to protect themselves than any other dinosaurs. They looked something like large reptilian kangaroos, with long graceful necks and heavy tails used to balance themselves when they stretched to nibble overhead foliage. The species were distinguished by their skull shapes. Some had a bony ridge on the forehead, directly over the nostrils, some had small spikes on top of the head, others a massive protruding forehead.

Not all the plant-eaters were as vulnerable as the hadrosaurs. Ceratopsians, for instance, were squat quadrupeds with short necks and massive skull plates that swept back over their shoulders. *Triceratops* was the largest of all herbivores, stretching 30 feet in length and weighing as much as 12 tons. Its strong hind limbs lifted its hips 10 feet above the ground. Its skull alone was seven feet long and armoured with three spikes, one on the snout and another above each eye. It was likely one of very few herbivores capable of beating back a large attacking carnivore.

To learn more about these fascinating creatures, in any case, workers at the Tyrrell just keep on digging. Over the last month, volunteers from across North America, Europe and Asia, most of them students, have been wrapping up three summer digs at Dinosaur Provincial Park, 25 miles northeast of Brooks on the southern reaches of the Badlands. Through the summer they lived in a cluster of trailers pervaded by a summer camp

atmosphere: enthusiastic and always casual. Wearing khaki, jeans, cut-off shorts, baseball caps and T-shirts (the popular shirt this summer sported a dinosaur—with sunglasses and a cigarette—above the caption "Too Cool for Extinction"), the volunteers arose at 6:30 a.m. to breakfasts of cereal, eggs and sausage served by a cynical Alberta College of Art student gone somewhat stir-crazy. But he was an exception. The eager young dino-hunters happily lugged jackhammers, shovels, hammers, awls, pocket knives and dental tools out to their site to begin an eight-



Museum aide Lenore Owen with specimen
Alberta has offered up 55 new dinosaur species.

hour day of painstakingly removing precious bones from their rock matrix. Relief from the hot sun, which regularly pushed the mercury to 38° C, was found in the slow, cool Red Deer River. They returned to camp for supper at about 5 p.m., then spent the evening prospecting for bones and fossils in the nearby hills. Directors and volunteers sat around kitchen tables drinking beer until as late as 1:30 a.m. discussing the possibilities of new bone-hunting instrumentation, for instance a heat sensor that would distinguish bone beneath the earth's surface from its rocky grave. There is only one subject of interest at the digs: dinosaurs.

In a white-walled, fluorescent-lit room with a high ceiling, Tyrrell scientists reconstruct and refurbish the bones trucked in from the field by the volunteers. A hoist and air and water hoses are suspended from the ceiling; cleaners and glues and plasters and plastics used to connect and rebuild bones line neat shelves. All told, it can take 18 months to

reconstruct a skeleton. The final product is worth as much as \$250,000 in salaries.

Among the many questions Tyrrell scientists hope to answer during the course of their work is how dinosaurs became extinct. There is no shortage of theories: Dr. Currie counted 100 at one point. Some say dinosaurs starved, others say they over-ate. One says that their bodies grew so large that their tiny brains were unable to control them any longer. Another says that they grew too fat to mate. Some credit their demise to God's will or a lemming-like suicide binge.

The most widely accepted theory is that they succumbed over millions of years to changes in the climate or vegetative growth, but it is now being challenged by the belief that a massive meteor shower rained upon the earth, kicking up enough dust to block out the sun and killing all life forms. Evidence uncovered in Alberta, says Dr. Currie, supports the former theory. Some 55 species of dinosaur lived in the south end of the Red Deer River valley about 73 million years ago. Six million years later the number seems to have dropped to 25. In Huxley, at the north end of the valley where dinosaurs lived as recently as 65 million years ago, only six different species have been found. "What's most exciting," enthuses Dr. Currie, "is that all these theories are going to be made or broken right here in the field."

The visiting public (there is no admission charge) can watch scientists build the models from behind a large window that overlooks the reconstruction room. The idea of bringing people as close as possible to the bones and scientists is Dr. David Baird's. The museum's director and a former on-camera scientist for CBC TV's *Live and Learn* series, he abhors the traditional echoing tile corridors, roped-off exhibitions and glaring security guards found in most museums. The Tyrrell is full of "hands-on" exhibits that demonstrate how the earth's plates rub against each other creating new terrains, how the jaws of a dinosaur open and close, how sediment is deposited on bones, creating fossils. Rather than showing off piles of fossils, Dr. Baird first provides visitors with a basic understanding, through self-serve computer terminals and videos, of evolution and the earth's history. "Sixty-five million years is beyond the comprehension of most people," he explains. "We have to put it in context." The emphasis is on participation and play, a concession to the short attention

spans of generations raised on television.

A professorial-looking man with a receding hairline who favours wool suits and bifocals, Dr. Baird, 65, came to the Tyrrell with impressive credentials. He has taught geology at four eastern Canadian post-secondary schools, founding the geology departments in three of them. He has published 70 scientific papers and 12 popular books, including guides to Banff, Jasper and Yoho national parks. He created Ottawa's National Museum of Science and Technology in 1966 and remained its director until 1981 when he joined the Tyrrell. He has received no fewer than three honorary degrees and the Bancroft Award for popularizing science, from the Royal Society of Canada.

Credentials aside, Dr. Baird's first months at the Tyrrell did little to endear him to his staff. He immediately scrapped

all plans that had been considered for the facility and started from scratch with his own ideas. He has a reputation as an unbending, inflexible employer that has tended to isolate him from his staff. His well-honed sense of humour hasn't helped. He offended the staffer of his scientific staffers by producing a spoof study on dinosaur flatulence that they felt mocked their own work as excessively esoteric and long-winded. "Could blasts from subcaudal regions of dinosaurs set off avalanches or earthquakes?" he asked rhetorically. "Could gaseous expulsions set off miniature tidal waves . . . , cause deafness on a large scale or lead to difficulty for predators accustomed to apprehending prey by stealth?" He also refers to young women as "sides of beef" and insists on being referred to as Dr. Baird, reprimanding inferiors who call him by his first name. Many staffers at the Tyrrell

are upset that the director has been given most of the credit for building the museum when Dr. Currie, they insist, deserves the accolades.

In any case the Tyrrell is now very much Dr. Baird's kind of museum: fun, noisy, dramatic and instructional. "My staff used to complain about the racket," he says. "I'd tell them that's the sound of success, that's what this museum is for. I want it to be a fun place with lots of noise, people winding cranks, pushing buttons and making things work. Enjoying themselves. I don't want another of these terribly solemn places." And then he steals a page from the public relations guide for Edmonton's recently-opened third phase of West Edmonton Mall: "Albertans don't have to go to New York or Ottawa or Toronto anymore to see Alberta dinosaurs. It's all right here."

Susan Deaton and Kenneth Whyte

Tyrrell's treasures

It was probably the best week any geologist had ever had. One hot, sunny afternoon in late June 1884, 24-year-old Joseph Burr Tyrrell crept along the steep sienna-and-grey-striped slopes of the Red Deer River valley, searching for coal deposits among the exposed layers. He spotted a brownish, rock-like structure protruding from the bank, 200 feet above the shallow, winding river. He scrambled up the slope and began delicately sweeping dirt away from the brittle mass, realizing to his amazement that he was uncovering the fossilized remains of a dinosaur. While this and subsequent discoveries were enough to inextricably link his name with the fossil-rich Alberta Badlands, Mr. Tyrrell had the further fortune three days later of uncovering one of Canada's greatest coal deposits, the well-spring of what was to become Drumheller's flourishing coal mining industry.

Born on November 1, 1858, in Weston, Ont., the son of an immigrant Irish stonemason, Mr. Tyrrell developed an interest in geology and natural history at an early age. He contracted scarlet fever as a schoolboy and was left half deaf and nearly blind without his glasses. Nevertheless, he grew to be a tall, healthy, intelligent young man. He abandoned a law career in his early 20s to join the Canadian Geological Survey where he quickly rose from third-class clerk to one of its most respected explorers.

In 1884, Mr. Tyrrell was entrusted with an independent survey stretching over a 5,000-acre area between the Bow and North Saskatchewan Rivers, the centre of which is present-day Drumheller. It was there he discovered the coal and dinosaur deposits. He recalled one of the finds at age 69. "I was climbing a steep face about 400 feet high. I stuck my head around a point and there was this skull leering at me, sticking right out of the ground. It gave me a fright." Working without proper tools or packing equipment, he carefully removed it from its resting place and, over a two-month period, unearthed several other bones. Working alternately on foot and with horse and buggy, he hauled his finds up the riverbank and through the Badlands to Calgary, a journey of about 100 miles. He shipped the bones to Ottawa. The skull was eventually identified as belonging to a large, flesh-eating animal of the Cretaceous

period (100 million to 64 million years ago). It was later christened *Albertosaurus*.

Though he was remembered by many co-workers as a vain, name-dropping bore, there was no disputing Mr. Tyrrell's success. During his 17 years with the survey, he explored vast areas of western and northern Canada, consolidating information gathered by previous explorers and filling in blank areas of maps, especially in what are now the Northwest Territories. In 1899 he settled with his wife and baby daughter in Dawson City, Y.T., establishing himself as a mining consultant at the height of the gold rush. Earning as much as \$1,250 a week, he never worried about money again. In 1906 he moved to Ottawa to run the fast-growing gold-seeking Kirkland Mines company. His reputation gained him federal commissions to edit the diaries of such noted explorers as Samuel Hearne and David Thompson. He later returned to Weston and died there of a massive heart attack in 1957 at age 99.

While Mr. Tyrrell's name is already attached to the new \$30-million museum of paleontology in Drumheller, the facility's director, David Baird, would like to go one step further. He has been trying for four years to convince the National Museum of Science in Ottawa to lend the original *Albertosaurus* skull to the Tyrrell Museum in hopes of setting up a shrine to the explorer. But because it is the "type specimen" for the species (meaning that all subsequent *Albertosaurus* skeletons discovered are compared against it) and therefore invaluable to paleontologists, the national museum won't release it for public viewing. Though Dr. Baird is still determined to get the original, a plastic replica has been sent to Drumheller which he'll consider using in its stead.

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Joseph Burr Tyrrell
It gave him a fright.