

TRICERATOPS AND SMALL THEROPODS  
WERE AMONG THE SPECIES OF DINOSAURS  
THAT ROAMED LUSH SWAMPLANDS OF  
WHAT IS NOW ALASKA.



KAREN CARR

# ARCTIC ANCESTRY

By Ned Rozell

*Dinosaurs thrived in a polar environment  
far different from the Alaska of today*

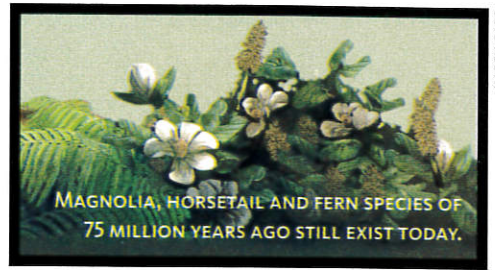
**W**hen flying over Alaska, you can look out the window and imagine the creatures striding beneath you, through the forests and over the tundra—lumbering grizzly bears, long-legged moose and caribou so abundant they outnumber Alaskans.

With a little imagination, you can close your eyes and picture the northern Alaska landscape about 75 million years ago. The spruce forests haven't arrived yet; the landscape is characterized instead by scattered bald cypress- and sequoia-type trees, with ferns growing beneath them. Mountains that will one day be the Brooks Range rise in the distance, and flatlands stretch beneath them as far as you can see.

its smallish head, which scans the horizon for *Albertosaurus*. All the while, birds

that resemble giant ducks float on warmish lakes, wary of predatory walking lizards hunting for a meal.

If you knew your Alaska dinosaurs, you could pick out eight different types in northern Alaska: four meat eaters and four that preferred plants. If your bush plane should happen to touch down on a gravel bar in the middle of this landscape, you would smell moist greenery and think the air felt a lot like the coast of Oregon or maybe California. But you



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ALASKA'S COASTAL ENVIRONMENT DURING THE CRETACEOUS PERIOD SUPPORTED A VERY DIFFERENT RANGE OF LIFE THAN IT DOES TODAY.

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The landscape is open enough that you probably won't even need to squint to see the oversize prehistoric fauna of Alaska.

Though a little smaller than *Tyrannosaurus rex*, the *Albertosaurus* looks just as intimidating as it thunders across prehistoric swamplands. *Albertosaurus* walks upright on two hind legs, its arms dangling in front, ready to hold to its jaws the carcass of another unfortunate dinosaur, most likely a herbivore such as the *Pachyrhinosaurus*. The *Pachyrhinosaurus* looks something like a stegosaur as it grazes on aquatic greens, as would a prehistoric moose, though displacing a lot more water than a moose. The agile *Saurornitholestes* stands 6 feet and weighs about 100 pounds; it may hunt in packs like wolves, only *Saurornitholestes* pack members sprint on two legs instead of four. *Edmontosaurus* is a giant, brontosaurus-type plant eater measuring about 50 feet from tail to

probably wouldn't notice much else before an *Albertosaurus* strode up to greet you.

Alaska was a different place in the time of the dinosaurs, the largest creatures ever to roam the far northern landscape. In the past, Alaska has been a warmer place, a darker place, a place where hickory trees grew, mammoths trumpeted and lions roared.

#### WHAT DINOSAUR SCIENTISTS HAVE FOUND

Though Native hunters, probably for hundreds of years, found extra-large bones, that they couldn't explain, falling out of riverbanks, scientists didn't gather evidence of northern dinosaurs until 1961. That year, Robert Liscomb, a geologist for Shell Oil, found in northwest Alaska the bones of the duck-billed plant eater known as *Edmontosaurus*. Liscomb and his co-workers thought the bones belonged to some ancient mammals until, in the mid-1980s, dinosaur

researcher Charles Repenning of the U.S. Geological Survey identified the remains as those of a dinosaur.

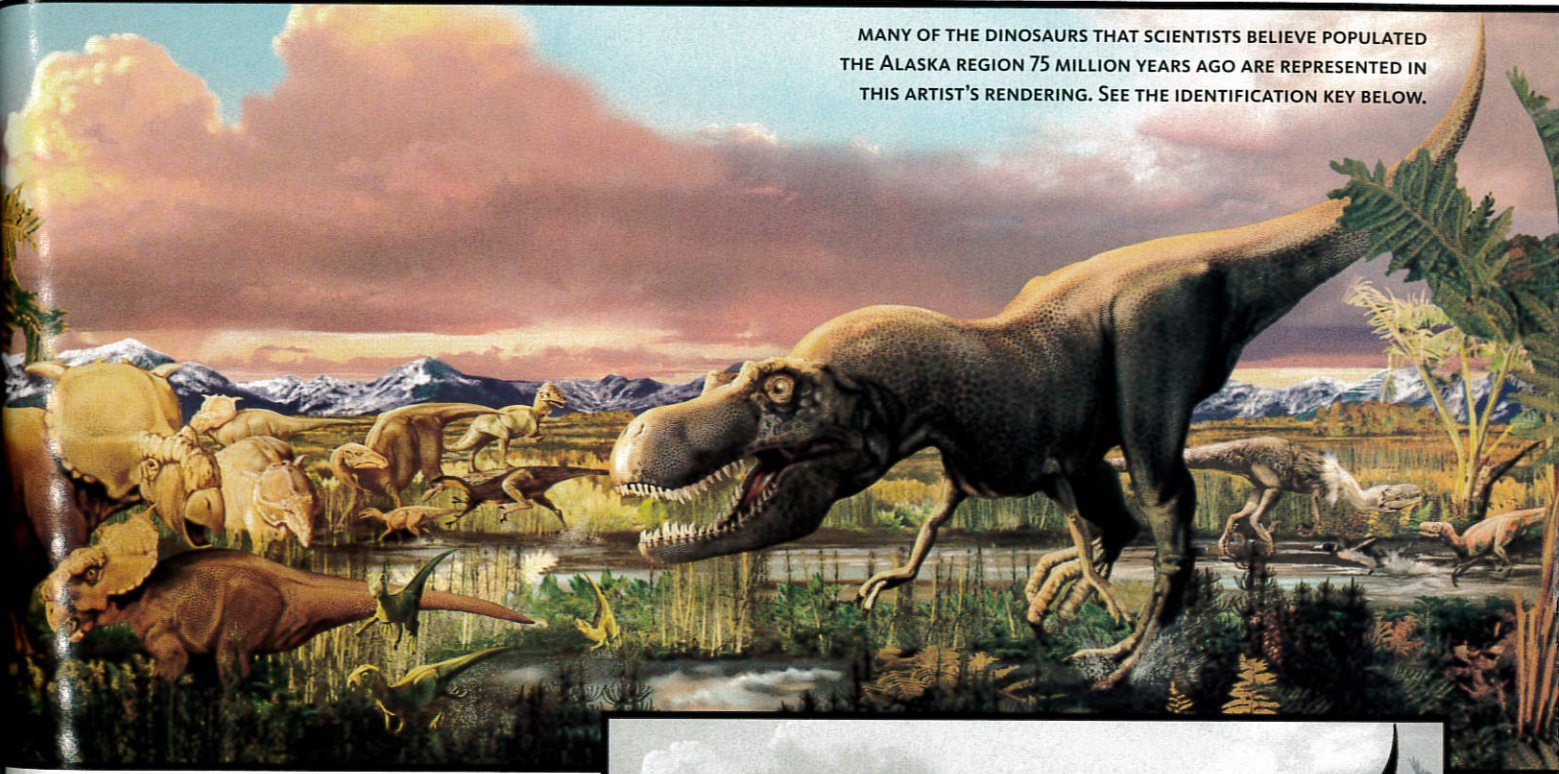
In 1968 trapper John Luster of the Talkeetna Mountains found a skull and two teeth from a plant-eating dinosaur, a species of ankylosaur.

In 1975 a couple of other oil-company geologists found more than a dozen footprints of meat-eating dinosaurs preserved in rocks on the Alaska Peninsula.

within the crumbling banks of the Colville River, on Alaska's frigid North Slope between the Brooks Range and the Arctic Ocean. A 60-mile stretch of the river holds layers of well-preserved dinosaur bones.

Paleontologists have found thousands of bones in the soil banks of the Colville, along with birdlike tracks as large as a human hand. The most common far-north dinosaur they have found there is *Edmontosaurus*.

MANY OF THE DINOSAURS THAT SCIENTISTS BELIEVE POPULATED THE ALASKA REGION 75 MILLION YEARS AGO ARE REPRESENTED IN THIS ARTIST'S RENDERING. SEE THE IDENTIFICATION KEY BELOW.



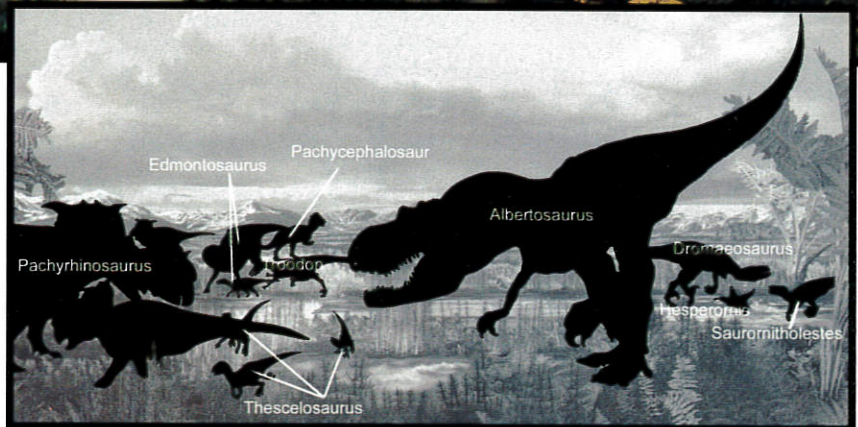
KAREN CARR (2)

The rocks were 135 million years old, which led scientists to believe dinosaurs had walked through mud that was protected from weather long enough to turn to stone.

More recently, people found a hadrosaur footprint in Aniakchak National Monument on the Alaska Peninsula and a duck-billed hadrosaur in the Talkeetna Mountains. During the past few years, paleontologists and students have had good luck in Denali National Park.

In 2005, an undergraduate student working in a park field camp with geologist Paul McCarthy of the University of Alaska Fairbanks found the fossilized track of a prehistoric theropod (a small meat eater), and in 2006, scientists—including Tony Fiorillo of the Museum of Nature and Science in Dallas—found fossils of meat-eating dinosaurs and footprints of the duckbilled dinosaurs they ate.

The richest dinosaur graveyard in Alaska exists



One of the most interesting finds has been a group of seven skulls belonging to the triceratopslike *Pachyrhinosaurus*. The dinosaurs probably died together in a flood about 75 million years ago, Fiorillo says. The proximity of the skulls, he says, proves for the first time that northern dinosaurs hung out together.

#### ALASKA AT THE TIME OF THE DINOSAURS

At the time the swollen river swept up that group of *Pachyrhinosauruses*, northern Alaska was a warmer place than it is today. From studying fossilized pollen



MAMMOTHS, RUDDY DUCKS, GLYPTODONT, GOPHER TORTOISE AND BISON ANTIQUAS WERE SOME OF THE ALASKA FAUNA OF THE PLEISTOCENE EPOCH, FROM ABOUT 1.65 MILLION UNTIL 10,000 YEARS AGO.

KAREN CARR

grains that show the lush plant life of 75 million years ago, scientists have determined that average yearly temperatures on the North Slope were above the freezing point of water. The average yearly temperature today for Umiat, a comparable location, is 11 degrees Fahrenheit, according to the Alaska Climate Research Center at the University of Alaska Fairbanks.

Sturgeon, sharks and pond turtles—none of them surviving in Alaska waters today—swam the lakes and oceans of Alaska 75 million years ago. Pollen of prehistoric cypress- and sequoia-like trees and warmth-loving ferns suggest that the climate was similar to that of Seattle or coastal Oregon, or it may have been as warm as Southern California or a Louisiana bayou.

Life for the northern dinosaurs had different challenges than air temperature. Geologic tests of magnetism within rocks shows that Alaska's far north was even farther north (closer to the earth's northern rotational axis) at the time of the dinosaurs than it is today, which means the winters would have been very dark. Today, the region loses up to eight minutes of sunlight each day after the fall equinox (about September 23) until the sun fails to rise in November and doesn't pop over the horizon again until early the next year. The landscape goes dim for much of the night and day, with twilight for several hours at midday. Though the temperatures were warmer back

then, the dinosaurs not only dealt with extreme darkness but also with the occasional snowstorm. How did these giant lizards survive?

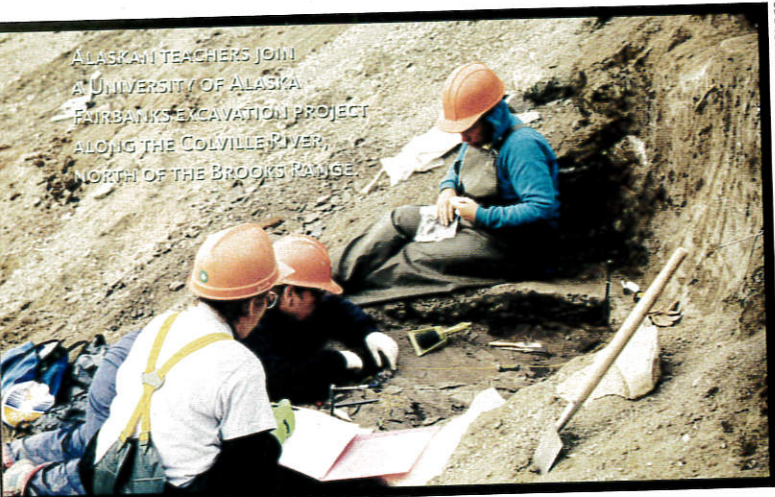
Today, grizzly bears and ground squirrels that live north of the Brooks Range conserve energy by avoiding the extreme cold, hibernating in underground dens during the long winter. But Fiorillo of the Museum of Nature and Science in Dallas points out that it's tough to picture a 35-foot hadrosaur digging itself a den to avoid the dark season. Dinosaurs may have dialed down their metabolisms to require less food during the low-sunlight months, and some researchers have suggested that the dinosaurs might have migrated south, the strategy today of millions of birds that visit Alaska in the warm abundance of summer.

Fiorillo doesn't buy the migration theory. He and Roland Gangloff, a researcher and visiting scholar at the University of California Berkeley, tested that hypothesis by comparing hadrosaurs to the current long-distance traveler of Alaska, the caribou. Caribou calves are able to migrate shortly after they are born, with long legs and great endurance, but the scientists figured that young hadrosaurs were much smaller than young caribou and wouldn't have had what it took to claw their way toward more sunshine.

A dinosaur known as *Troodon* hints that northern dinosaurs may have been adapted to periods of very

ALASKAN TEACHERS JOIN  
A UNIVERSITY OF ALASKA  
FAIRBANKS EXCAVATION PROJECT  
ALONG THE COLVILLE RIVER,  
NORTH OF THE BROOKS RANGE

R. A. GANGLOFF



## TOUGHER THAN A GIANT METEORITE?

These possible adaptations to darkness make some scientists question the prevailing idea of dinosaur extinction, that a meteorite struck Earth near present-day Mexico about 65 million years ago. That giant meteorite, impacting near today's Yucatán Peninsula, kicked up dust that blocked the sun's rays and cooled the planet to temperatures unbearable for dinosaurs. Gangloff thinks Alaska dinosaurs, as well as polar dinosaurs whose remains turned up in Australia, were too tough for such an end.

"If dinosaurs adapted to such a variety of environments, how did one nuclear winter knock them off?" he says. "Anyone who explains the whole picture of dinosaur extinction has to explain high-latitude dinosaurs."

low light. Paleontologists have found teeth of the meat eater, which had a large brain, throughout Alaska, suggesting that *Troodon*, about the height and weight of an NFL lineman, was very common in the far north. One of *Troodon*'s most striking features is its large eye sockets. Animals with large eyes, such as the flying squirrel that glides through Alaska nights, are often adapted to living in darkness. *Troodon* may have been one of Alaska's most successful dinosaurs because it could see better than others for a good portion of the year.

Alaska scientists and their colleagues in Australia have both discovered species of dinosaur with bulging brains and eyeballs, and northern hadrosaurs also left behind skulls with hundreds of teeth, possibly used to grind up silica-rich ferns and horsetails that lived in colder climates. Researchers in Australia found dinosaur remains near evidence of permafrost—ground frozen for more than one year—and dated both the dinosaurs and the frozen ground to the same

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