

Sanford Mauldin



# HALL OF ANCIENT LIFE

BY BEN FENWICK

**D**rought had come to the land, and *Apatosaurus* was dying. At 93 feet long, the creature normally grazed among the treetops of the Cycads, Ginkgoes, tree ferns and conifer trees that populated the vast fern savannas and forests of what would one day be Oklahoma. Now, however, times were bad. A full 145 million years before Will Rogers would joke about Oklahoma weather, the normal dry season cycle unpredictably had lasted much longer than expected. The rainy season—there was no winter—had not yet come, and the giant creature trudged to the only place it had ever found water during such a time—the great boggy lake that lay in the present-day Panhandle. At 45 tons, the *Apatosaurus* shook the ground when it strode, but neighboring fauna were fairly safe. *Apatosaurus* was strictly a plant eater.

Another nearby creature was not so benevolent. It watched through the thatches of dying prairie ferns as the *Apatosaurus*, weakened by thirst, ambled past. The lurking predator was smaller than the *Apatosaurus*, but vicious. The *Saurophaganax maximus* was a particularly large version of the more famous *Allosaurus*; it would be a good idea to run from such an adversary, providing one could run that fast. The quick, powerful legs probably carried the monster as swiftly as a horse, sinewy muscles rippling beneath the sheen of its snakelike skin. Usually it hunted alone or perhaps with another of its kind. *Saurophaganax* had four-inch teeth and powerful grasping forearms with incredibly large, sharp claws. *Saurophaganax* also had also been gifted with a larger brain than the plant-eating *Apatosaurus*. Although this nightmare creature never wrote a play, sang show tunes or solved the quadratic equation, its larger brain possibly helped it catch an *Apatosaurus* when it could find one.

Bringing down this particular *Apatosaurus*, however, would be ambitious, sick as the would-be victim was. Even for a fearsome predator like *Saurophaganax*, attacking this giant herbivore literally could be biting off more than *Saurophaganax* could chew. When the other big-brained creatures, humans, dug up this Oklahoma-born *Apatosaurus*, it would be the largest ever found. So, too, would be the *Saurophaganax*.

*continued*

Modern man's love affair with the dinosaurs finds expression in exhibits devoted to the inhabitants of the Oklahoma Shore.





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PREVIOUS PAGE: There is more than one way to view “The Clash of the Titans” in the Hall of Ancient Life—from the top down or the bottom up. On page 10, riders on the “Dinosaurs,” appropriately designated “Eye to Eye” and “Belly of the Beast,” can stare down the larger *Apatosaurus* from the safety of glass-front elevators.

ABOVE: From ground level, a modern-day family stares up in fascination at the *Saurophaganax maximus* as it attacks the *Apatosaurus*. It is unlikely that such an encounter felled either of these prehistoric monsters, but some sort of catastrophe left their fossilized remains to be found in their Panhandle graves by 20<sup>th</sup> century paleontologists.

Maybe the two dinosaurs fought. Maybe they both fled a common danger. Fled what? A fire? Something even bigger? Perhaps the drought took them both, leaving their carcasses baking in the drying mud of the dead lake. All we really know is that 145 million years ago, they both fell.

Time passed. Darkness covered the earth, then washed away. The seas rose and fell. New creatures grew from what was.

Cut to 1935: hard times, the Depression, and the dust bowl. It would be hard to find a place in Oklahoma dustier than the Panhandle. At the paleontology dig at Black Mesa, the wind never stopped—in the winter, knife-cold, in the summer hot as burning sandpaper. The ground was flat and treeless, the horizon the only feature. Yet in the midst of this dusty day toiled men from President Franklin D. Roosevelt’s Works Project Administration (W.P.A.). They had families to feed and a nation to rebuild. They worked at their jobs because they were lucky to have them. Yet, these particular men had a chore different from those who reconstructed the country with bridges and schools and roads. These men reconstructed the past. While the founding paleontologist for the youthful University of Oklahoma, J. Willis Stovall, looked on, they first began unlocking prehistoric creatures from their forgotten graves. Chipping the fossils out of a layer of rock known as the Morrison Formation, they finished the dig in 1942.

For more than 50 years, their finds languished in rickety horse stables with a five-minute burn time—the only storage facility available at OU. Today these priceless relics stand again. In the Sam Noble Oklahoma Museum of Natural History, the *Saurophaganax* and the *Apatosaurus* form the centerpiece of the museum’s Hall of Ancient Life in a display called “Clash of the Titans.”

When completed, this entire Hall of Ancient Life will transport visitors beginning from the far reaches of the Paleozoic, through more than 500 million years of Oklahoma’s prehistory, to the domination of the earth by mammals, estimated to have begun 65 million years ago. The sets are separated into time periods in which the creatures depicted lived, dominated by keystone exhibits in the Permian, Jurassic, Cretaceous, and through to the Cenozoic, or Age of Mammals.

“The room will promote how unique

Oklahoma is, and it will be able to show every geological time period,” exhibit coordinator Beth Larson says. “From Black Mesa to McCurtain County, it’s extraordinary.”

It is no coincidence the Clash of the Titans was the first exhibit to be completed.

On December 14, 1999, dinosaur reconstruction expert Peter May looked on with wonder at the enormity of his work. Workers used cranes, welders, and air-ratchets to construct the frames that hold the casts of the creatures.

May is used to big projects. Among his credits as president of Research Casting International (RCI) is the skeletal work used in Steven Spielberg’s *Jurassic Park*—in addition to dozens of other creatures, from *T. rex* to *Diplodocus* for museums around the world. This one, he says, was different.

“This guy is neat because he’s the only one,” May says, sounding like a kid with a train set on Christmas. “We do 10 *T. rex* a year. This is the biggest *Apatosaurus* ever made. This is also the biggest *Allosaurus* I’ve done.” (The *Saurophaganax* is a large, close cousin to the *Allosaurus*. OU paleontologist Richard Cifelli describes the *Saurophaganax* as “*Allosaurus* on steroids.”)

The “Titans” are even bigger than Spielberg’s. May says the OU dinosaurs each represent a one-of-a-kind specimen, the like of which exists nowhere else. The hall’s *Saurophaganax* and *Apatosaurus* were totally new for his staff of artist-scientists to reconstruct based on the bones unearthed all those years ago by Stovall’s team. The creatures had to be given steel skeletons to support them. The reconstructed *Apatosaurus* weighs in at two tons.

Larson was largely responsible for setting the stage for the hall’s centerpiece. She says the platform on which the two stand poised represents rock from the Morrison Formation—once that dry lakebed—from which both the creatures’ fossilized remains were chiseled.

“The gallery was designed for this,” Larson says. “It’s built around them.”

A huge mural surrounds both creatures, depicting them as they might have appeared in their time, the *Saurophaganax* closing in on the larger *Apatosaurus*. The *Saurophaganax* possibly could have brought down his prey, especially with some help, but it would have been a long shot.

“We tend to think the *Saurophaganax* *continued on page 14*

was just annoying the *Apatosaurus*,” says graduate researcher Matthew Wedel.

The Titans mural depicts the two dinosaurs as being surrounded by prehistoric conifers and ferns that formed most of the flora of their time. Flora is a term used loosely here; there were no flowering plants in these times. Esthetic-minded dinosaurs would have had to be content with the various kinds of fern-trees and other non-flowering plants. Nevertheless, the first true birds, as shown in the mural, came into being even while some of the world’s largest reptiles walked the earth.

The sounds in the hall were created by Bernie Krause, once a musician with such greats as Mick Jagger, The Weavers, Frank

will stretch from the Cambrian period—through the Permian, a time when the most primitive land reptiles evolved—through the Triassic, a time when everything was on one continent—through the Jurassic, when the great dinosaurs first walked the earth—to the Cretaceous, at the end of which a great meteorite may have struck the earth and wiped out the dinosaurs.

The first major display begins with the Permian Period, as some exhibits are still being completed. Some of the current displays for the Permian time period are temporary and will be replaced by more permanent installa-



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Zappa, and George Harrison. Now a sound naturalist, he specially engineered these noises to create the feeling that one is immersed in the Jurassic, in a forest glen where the two dinosaurs circle each other.

Around the dinosaurs, the Hall of Ancient Life stretches from the front to the rear of the museum, taking up about a quarter of the first-floor exhibit space. More importantly, however, it also takes up time—more time than all the rest of the museum combined—more than 500 million years. When finished, the hall

tions. Among the creatures presently represented are some earlier Oklahoma natives, the *Dimetrodon* and the *Cotylorhynchus*, two very early reptiles.

“This is a real native community here,” Cifelli says. “These animals all come from central Oklahoma. In fact we are famous for them.”

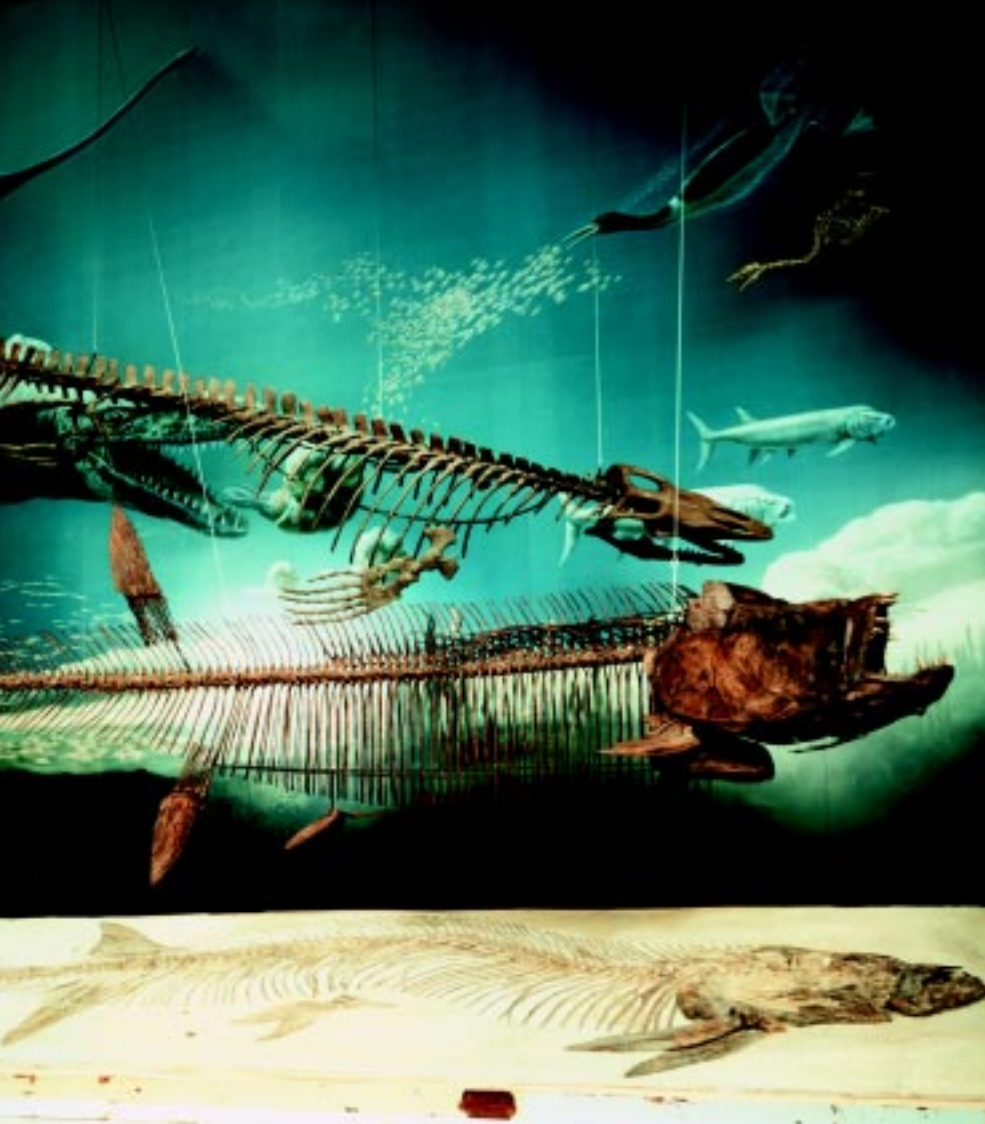
The *Dimetrodon* is a sail-backed reptile, about the size of an immature alligator, whose spines are thought to have supported a big, colorful crest that was used to intimidate other creatures or at-



ABOVE: Just when you thought it was safe to go back into the water, comes these nightmarish marine carnivores swimming the seas that once covered present-day Oklahoma. This Hall of Ancient Life exhibit is dominated by the *Xiphactinus*, a very distant relative of the herring.

LEFT: While his close cousin, *Sauropaganax*, is next door in the Hall of Ancient Life, terrorizing the *Apatosaurus* in “Clash of the Titans,” this *Allosaurus fragilius* offers visitors a glimpse of the perils of the late Jurassic period, 140 million years ago. At 42 feet long and 14 high, the *Allosaurus* was an active hunter of his plant-eating brethren.





The rule of the Jurassic dinosaurs over Oklahoma soil lasted many millions of years, but faded as the seas rose over the land. Then, in the watery depths that covered Oklahoma, other nightmarish creatures evolved. The largest carnivores to swim the oceans lived their lives here, headed by the huge lizard mosasaur, which dined on fish and other water creatures.

Also exhibited here is the 12-foot-long *Xiphactinus*, a long, bony predator fish who looks like the meanest largemouth bass ever pulled from Lake Texoma but is actually related to herrings. Depicted nearby is a *Hesperornis*, a loon-like aquatic bird with vestigial wings. Above the waves soared the largest sky creatures, the pterosaurs, or flying reptiles.

"These creatures appear to have largely inhabited coastal areas, living in coastal rookeries," Larson says of the pterosaurs. Despite their fearsome reputations in feature movies, pterosaurs probably lived on fish, like great pelicans. Even the biggest were only a little larger than today's turkey buzzards.

Then the seas faded, and with them many of the creatures of this time, into another extinction. Oklahoma was once again mostly dry land, except for the southeastern part, near Atoka, a river delta.

This was the Cretaceous era, last in the grand scope of time known as the

## Exhibited here is the 12-foot-long *Xiphactinus*, a long, bony predator fish who looks like the meanest largemouth bass ever pulled from Lake Texoma.

tract mates. Called "mammal-like," these creatures are believed to be the ancestors of warm-blooded mammals, Cifelli says.

The *Cotylorhynchus* another one-of-a-kind creature, so far known only to come from Oklahoma.

"His name means cup nose," Cifelli explains. "He has great, big nostrils. He's the biggest of his time there, a plant-eater. He was about 12 feet long."

Also represented here is an *Eryops*, a great shovel-headed carnivorous amphibian that looked like an oversized salamander.

Even before the extinction of dinosaurs (known as the K-T event) 65 million years ago, another extinction occurred that separated these creatures from the creatures of the Triassic and the Juras-

sic. Known as the great Permian extinction, the catastrophic event is believed to have killed about 70 percent of all things living 220 million years ago.

"This one wiped out most of the life on earth," Larson comments. "It was worse than the K-T event."

Indeed, most of the eras in life's history on earth are divided by scientists into different sections based upon these patterns of extinction, a resurgence of life, then more extinction, Cifelli says.

"The Jurassic/Cretaceous boundary is about at 145 million years ago," Cifelli says. "It's defined on the basis of fossils found in Europe. There is a change in the marine fauna. It has to do with old things going out and new things going in. This means extinction."

Mesozoic. During this period, the first flowering plant—the venerable magnolia—bloomed. Along with these flowering plants arose insects that anyone would recognize, among them the butterfly and the bee.

Here, visitors to the museum are confronted with perhaps the fiercest creatures ever to live—the *Deinonychus*. These are the "raptors," small, predatory dinosaurs popularized in *Jurassic Park*. Although nine feet long, in typical pose they stood about as tall as a Great Dane, weighed in at around 150 pounds, and hunted in efficient killing packs."

These vicious predators are depicted in the museum closing in on a *Tenontosaurus* family in a scene believed to have actually occurred around 110

million years ago near present-day Antlers. The scene shows a mother and her babies confronted by the *Deinonychus* pack. These duckbilled plant-eaters were often the prey of the raptors, and their fossils have been found with the raptors' teeth still imbedded in them.

In the corner, almost a curiosity, is a *Gobicondon*, a small, primitive mammal of the time. A young *Tenontosaurus*

looks at him curiously in this scene. We should look long on him, too. He was paving the way for us.

In the mural, far off in the distance, is the granddaddy of them all—the *Sauroposeidon*. Only recently discovered by OU's Cifelli and Wedel, this great dinosaur of the group called sauropods was a gargantuan, 50-million-year-distant relative of the *Apatosaurus* in the

*Pentaceratops*, which sported a head more than 10 feet tall. On display in the area toward the end of the Cretaceous in the Hall of Ancient Life is that creature.

Cifelli explains that the bones were found in a quarry in New Mexico when one of the *Pentaceratops*' horns was seen poking out of an embankment. "Stovall and his guys were just out collecting at a famous fossil bed in the San Juan Basin. They stumbled across this thing and shipped it back."

This nearly complete skeleton is a rarity in paleontology. Only five *Pentaceratops* skulls are known to exist, this one being the most complete, the largest, and in the best condition. No other skeletons have been found.

"It's one of the most complete skeletons in the collection," Cifelli says. "It's the only one in existence that has the head attached with the skeleton. There is no other mounted *Pentaceratops* skull and skeleton in the world."

A plant-eater, *Pentaceratops* grazed down low, foraging in the now-richer plant life. Flowering plants, some with fruits or nuts, covered the land. It is in this era of the hall that we see one of the smallest items in the collection, a tiny flower fossil chipped from a piece of coal.

At the end of this section, and at the end of the dinosaurs, like everything before them, is extinction. After a nearly 200-million-year reign, the great reptiles vanished, marking the end of the Cretaceous era. The Keyes meteorite, found in Keyes, Oklahoma, represents this moment. The display of this large iron-nickel chunk of outer space represents symbolically a six-mile-wide asteroid or comet believed to have laid waste to a good chunk of the Western Hemisphere, filling the atmosphere with dust. Scientists theorize that this dust covered the earth in darkness, killing the plants, the plant-eating dinosaurs, and the carnivores that dined on them.

Although not yet permanent, the last exhibit in the Hall of Ancient Life is that of the mammals. Among others displayed here are a few of the skeletons of ancient, predatory, saber-toothed *Smilodon* cats; a massive, ancient bear; a few smaller marsupials; a beaver-toothed ancestor of the elephant; and finally, a great mammoth. With this section, the majesty of the prehistory ends, while a new story begins . . . ours.



Robert Taylor

Sporting the largest head of any land animal—more than 10 feet tall—the five-horned *Pentaceratops* is a rarity in paleontology. Only five such skulls are known to exist, this one being the largest, most intact and least damaged. Found in New Mexico, the SNOMNH specimen is a nearly complete skeleton—and the only one in existence with the head attached.

Clash of the Titans. Though the sauropods supposedly were dead by the Cretaceous, here he is. There is no display yet for OU's *Sauroposeidon*, but plans are in the works as funding becomes available.

The Great Plains were yet to see a blade of grass, those areas still populated largely by ferns. Grazing in this morass, in an area stretching from Montana to New Mexico, were the ceratopsians.

Ceratopsians included the well-known, three-horned *Triceratops*, but also the creature with the largest head of any land animal—the five-horned