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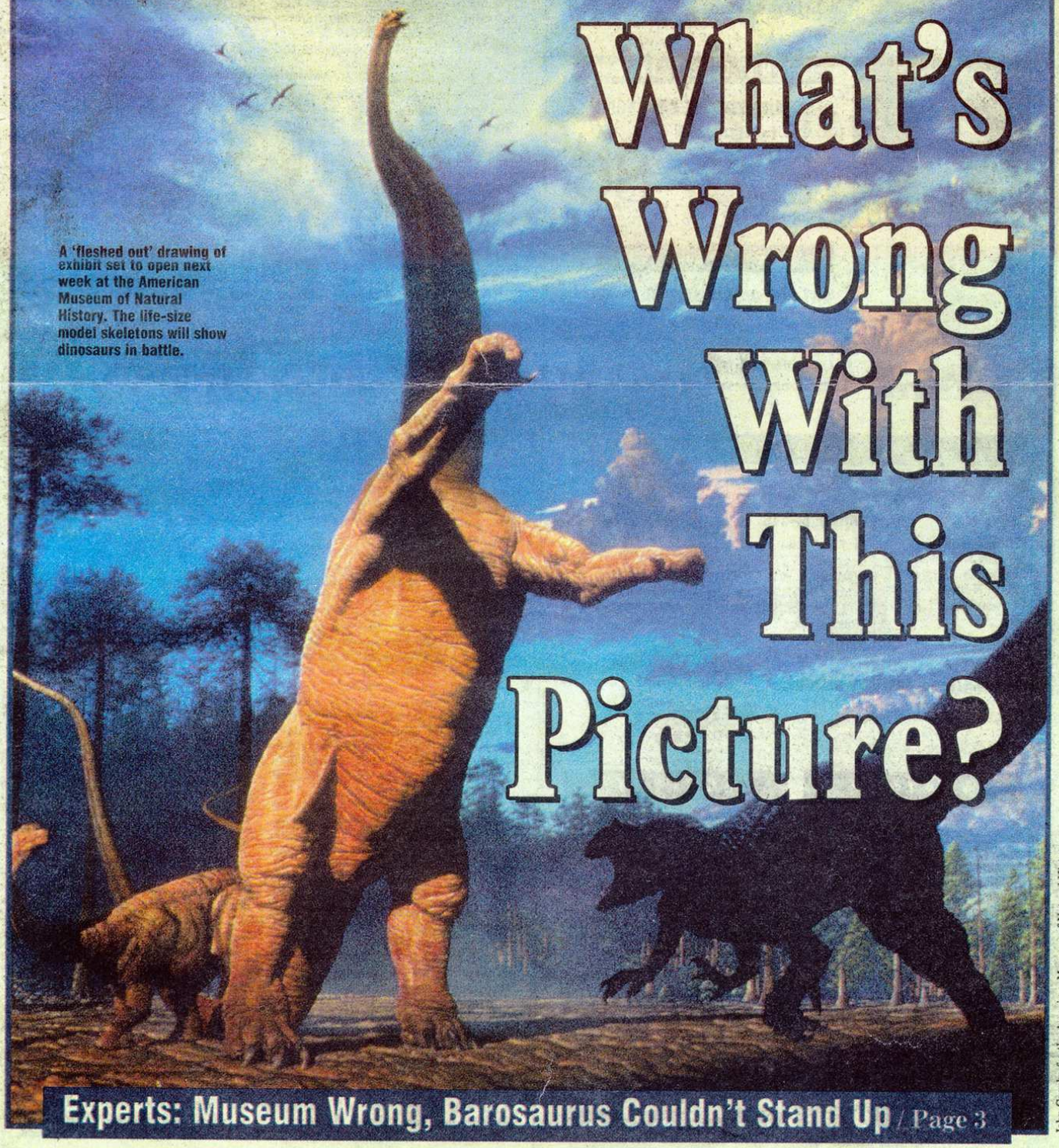
New Dinosaur Display

What's Wrong With This Picture?



A 'fleshed out' drawing of exhibit set to open next week at the American Museum of Natural History. The life-size model skeletons will show dinosaurs in battle.

John Gurche for the American Museum of Natural History

Experts: Museum Wrong, Barosaurus Couldn't Stand Up / Page 3

Dinosaur's Last Stand?

Exhibit's pose is all wrong, experts assert

By Molly Gordy
STAFF WRITER

With cloak-and-dagger secrecy, the American Museum of Natural History is poised to unleash the most gigantic and mesmerizing creature to loom over New York since King Kong raged atop the Empire State Building.

The five-story-high snarling barosaurus to be unveiled Wednesday in the museum's cathedral-like rotunda facing Central Park is certain to be the largest displayed dinosaur in the world — and the most controversial.

Museum officials describe it as "breathtaking" and "spectacular." Paleontologists across the continent are calling it "unscientific" and "inaccurate."

The display features a life-sized barosaurus skeleton modeled of polyester resins from 150-million-year-old fossils that have been languishing in the museum's basement since World War II. This small-headed, long-necked herbivore, of the sauropod family, is shown rearing up on her hind legs, 50 feet high, while her calf cowers behind her. A 20-foot-high allosaurus, a carnivorous therapod, is shown attacking on the run, with only one foot on the ground.

Of six leading paleontologists interviewed for this article, all but one questioned how a behemoth weighing in excess of 25 tons could be accurately depicted in an upright position. Most thought it physically impossible.

Two who asked not to be quoted in this article said the barosaurus' posture was chosen for dramatic effect over the objections of Gene Gaffney, the museum's chief paleontologist.

Neither Gaffney nor Lowell Dingus, the scientist in charge of the exhibit, could be reached for comment. Officials at the American Museum of Natural History said on four occasions that the institution's president, George D. Langdon Jr., had forbidden the staff to discuss the new exhibition.

One American Museum of Natural History official, speaking privately, defended the posture as appropriate in context. "It's an action scene. We're not saying the barosaurus would normally be seen rearing up, but this is an extreme situation, where she is protecting her young from prey," the official said. "It's a spectacular sight. When you walk up the steps through the main entrance, it's breathtaking."

In order to rise, the massive barosauraus would have to cantilever the weight over its hind limbs by rotating the weight of its torso, forearms and very long neck upward from the hip joint. The body mass would fall full force on its tail.

Dr. Kevin Padian, curator of the Museum of Paleontology in Berkeley, Calif., said he believes the barosaurus could stand on two feet because of its tail, which has flat, boat-shaped bones called chevrons beginning about a third of the way back.

"I haven't seen the barosaurus, but I've seen the diplodocus, which is similar, and those bones look like they're there to support weight," he said in a telephone interview. "The other sauropods don't have bones like that. So that's why some people are behind this. The guys at the museum weren't just making this up out of whole cloth."

Dr. Paul Sereno of the University of Chicago, who made history this year by discovering the earliest dinosaur on record, a 225 million-year-old skeleton in Argentina, begged to differ.

"Boat-shaped chevrons on the ventral side of the tail doesn't in and of itself tell you anything about its ability to rear up. It doesn't necessarily make it stronger

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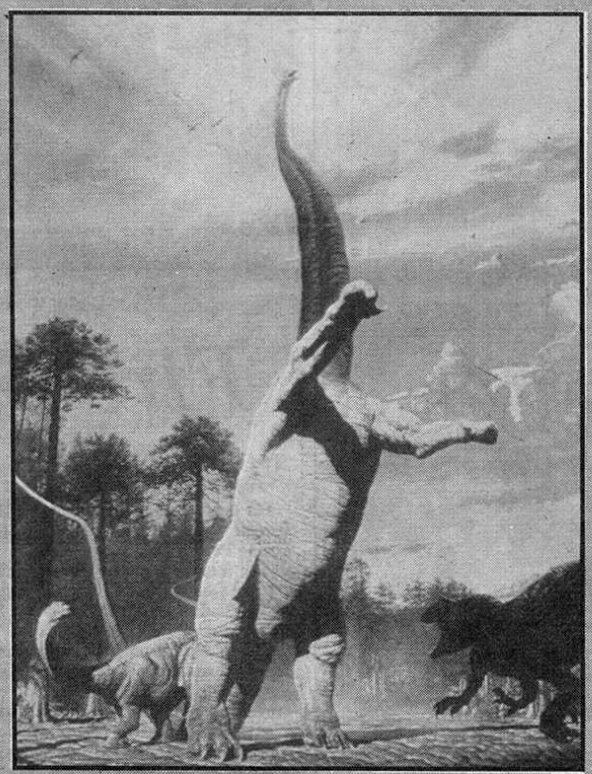
Newsday / Alan Raia

SHROUD OF SECRECY. Dr. Lowell Dingus, project director of the museum's fossil hall reconstruction, posed for a photo in February, but hasn't been talking lately about the new barosaurus exhibition.



'Sometimes you have to use a little P.T. Barnum to get people into a museum, and an allosaurus attacking a barosaurus is a heck of a show.'

— Dr. Jack Horner of the Museum of the Rockies in Bozeman, Mont., on the American Museum of Natural History's presentation of a five-story-high dinosaur skeleton modeled from 150-million-year-old fossils.

At Museum, Function Follows Form

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for balancing weight," he said.

Sereno surmised that a shorter-bodied sauropod might have stood erect. "The problem comes with this particularly dramatic barosaurus," he said. "It happens to have extra weight up front because of its long neck and an unusually long torso, and relatively short limbs compared to other sauropods. And this barosaurus is not only rising, but using its tail. There is no scientific evidence that this was the case."

Dr. Jack Horner of the Museum of the Rockies in Bozeman, Mont., who made a historic discovery of a complete allosaurus skeleton this year, notes that it is perfectly feasible to show the carnivorous therapod attacking the slower, herbivorous barosaurus.

But he disputed the museum's explanation of the barosaurus' motivation for rising. "Anyone who has been to the circus knows that an elephant is capable of standing on one foot. But you would never see it do that voluntarily in the wild," Horner said.

And since the allosaurus is a full 30 feet shorter than the barosaurus, he noted, why would the barosaurus need to rise up in defense?

"Considering the size advantage, you'd think that kicking the allosaurus with one leg would be pretty effective, or hitting it with the tail," Horner said. "The other problem is speed. The allosaurus could probably circle the barosaurus three times before it could get back on all fours."

Even if the barosaurus managed to struggle erect, it could not sustain the force of its weight thumping back to the ground, Horner and Sereno asserted in separate interviews. "That's why elephants don't jump; if you get on one, it's not going to buck you off, because its bones would literally shear," Horner said. "So, there are some questions of authenticity here."

Dr. Philip Currie, director of dinosaur research at Canada's Tyrell Museum in Drumheller, Alberta, compared the barosaurus' limitations to those of its distant descendant, the giraffe.

"I've never seen a giraffe stand on its hind legs," Currie said. "Like sauropods, they use their necks to reach things and feed high in the air. If requirements are such that they need to be higher, most paleontologists would conclude that they'd just evolve a longer neck.

"I also think that, by standing up, the taller barosaurus would be opening her belly up to attack."

If the forthcoming exhibit has any scientific value, Currie said, it's "that it forced them to pull the bones out of mothballs, so that they are now available for scientific research for the first time."

But even that aspect of the project has caused a flap.

In order for the real bones to be studied, they can't be displayed. Dr. Edwin H. Colbert, the American Museum of Natural History's retired curator of vertebrate pathology, has denounced the new exhibition publicly for not using a single fossil in the barosaurus model when it has a real skeleton in hand that is 80 percent complete.

Tamara Biggs, dinosaur exhibit coordinator for the Field Museum in Chicago, defended her New York counterparts on that count, noting that a plastic re-creation of a 175-pound fossilized bone weighs only 10 pounds. "The original bones are so heavy that using them would be not only difficult, but dangerous," she said. "You might even have to reinforce the floor, and the support mounting would have to be so big it would really detract from the model."

The barosaurus exhibit is the first complete segment of the museum's first major renovation since 1869. The $60 million overhaul, including $20 million for its research library, was launched 18 months ago and will take five years to complete.

The model was created by Peter May of Research Casting International in Toronto. Museum officials prohibited May from talking about the exhibit during his stay here this week. But at his Canadian headquarters, an assistant who would not give her name described the process as making clay molds of the original bones, then lining them with fiberglass and filling them with polyurethane foam. She compared it to building a surfboard.

Padian praised the reconstruction, saying: "It's based on a really rare specimen, they've used the most up-to-date technology, and it's going to really blow people away."

Molds of missing parts such as a shinbone and a shoulder blade were sculpted by examining their twins on the other side of the body, May's assistant said. The bones were attached by metal piping, and the model was transported in four sections — head and neck, torso and two pieces of tail — by truck to New York, where it was being assembled by May and a crew, she said.

The biggest challenge was crafting the mold for the baby barosaurus when there is almost no fossilized skeleton in existence, said the assistant.

"We had the neckbones and the skull, but it was primarily crushed. The originals will be on display in New York," she said. "So we also looked at baby animals similar to the barosaurus, like the diplodocus, and took dimensions from that."

Yet another controversy surrounds the museum's decision to have both barosaurus skeletal models dyed dark brown — the color of fossilized bones. This is in marked contrast to existing models in the American Museum of Natural History, which are the more traditional ivory white of living bones.

Biggs called the bone-color fuss "just a question of fashion."

"Even if some poetic license is taken, the general biological laws are respected," she said. "First the bone was covered with flesh and blood and muscle, then it was dead cadaver and animals ate off it, then it rotted in the mud, then it fossilized, so when was it ever pristine ivory-colored — at birth?"

Intellectual differences aside, all the scientists contacted praised the American Museum of Natural History for creating a dramatic display that is likely to increase the institution's current draw of 3 million visitors a year.

"Sometimes you have to use a little P.T. Barnum to get people into a museum, and an allosaurus attacking a barosaurus is a heck of a show," Horner said. "Once you get them into the rotunda you can get them into the rest of the museum, so I think they made the right choice."

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