

PALEONTOLOGY

Titan-Beasts

Monstrous Animals That Walked the Earth Some Fifty Million Years Ago Restored at the American Museum

By DR. FRANK THONE

See Front Cover

GIANTS were on the earth in those days—Titans.

Not the immense mortal men of old Greek mythology, who piled mountain on mountain in a vain war against the gods of high Olympus, but tremendous beasts that might well have served as steeds to these giant legendary warriors.

Only one discrepancy prevents: the Titans never lived; the Titan-Beasts did. Greek authors wrote epics of the Titans' battles, Greek artists painted them, so convincingly that generations of their countrymen (the most intelligent men who ever lived) believed in them implicitly. But no skull or spear or shield of Titan did they ever produce, so that at last the Titans failed in the faith of men as they had failed against the might of the gods.

Later justice, but more lasting, has been the fate of the Titan-Beasts. Long after they had lost all chance of having appropriate riders, the Titanotheres have been made alive again by the magic of science. At the American Museum of Natural History in New York, scientists have written their epic, artists have painted their pictures. And the seal of verity has been placed on this monument to their memory by their own monumental bones, gathered from lands that were not even myths to the Greeks of old.

Osborn Likes Big Ones

Outstanding among the scientific Homers who told the story of the Titan-Beasts is Prof. Henry Fairfield Osborn, until recently president of the American Museum of Natural History. Long a leader among researchers in paleontology, the study of ancient life on the earth, Prof. Osborn has had a special leaning toward sizeable fossil pets—he has done classic work on extinct elephants, as well as on the Titan-Beasts.

Closely associated with him have been Dr. Walter Granger and Dr. William K. Gregory, of the Museum scientific staff, and the artist C. R. Knight, whose portraits of animals no man ever saw

alive have won him world recognition. With the aid of these and other students, Prof. Osborn has assembled all known data about the Titan-Beasts into one monograph that is a Titan-Book—its two volumes total more than four inches thick, and weigh sixteen pounds. Most of it is much too tough going for the non-specialist reader, so various members of the Museum staff have prepared more popular accounts of the big animals which may be found elsewhere. The big book itself is a Government publication, put out by the U. S. Geological Survey.

The Titan-Beasts, or Titanotheres (Greek, meaning exactly the same thing) were big creatures, requiring plenty of leg-room. It is appropriate therefore that our first knowledge of them came from the great open spaces of the American West—the plains and mountain plateaus of Wyoming, Dakota, Nebraska. From these regions came first fragmentary bits of massive bones — some of the first pieces nearly a hundred years ago. Later, Museum expeditions began excavating whole bones, and more or less complete skulls, and considerable parts of skeletons.

First Known in America

Patiently fitting the pieces together, like jigsaw puzzles on an enormous scale, scientists presently began to get an idea of the amazing sheer size of the animals, but also of their structure (quite as amazing), and of their place in the animal kingdom—their kinship to both the living and the dead.

Although America was the only known home of the Titan-Beasts for a long time, Prof. Osborn was not satisfied that this seeming monopoly was real. He knew, from his own studies of the migrations of other animals, how the tides of life have flowed back and forth between this continent and Asia, and he prophesied that a search in the latter continent would turn up Titanotheres bones. And he was right. Expeditions from his own museum found them, in rock strata above those containing the famous dinosaur bones and eggs which they brought back from Asia's inner deserts and steppes.

Although the Titan-Beasts came final-

ly to a stature of eight feet or so at the shoulders, they started out much more modestly. The earliest recognizable members of the family, away back in the eocene, when the giant dinosaurs had been dead only a mere 75 million years, were no bigger than good-sized St. Bernard dogs—three feet at the shoulders. They were, however, much more massively constructed than dogs; looked more like stocky little rhinoceroses without horns.

Before the days when they could be recognized definitely as evolving Titan-Beasts, they had an ancestry leading back to the same group of primitive animals from which evolved also three groups of animals still in existence: horses, tapirs and rhinoceroses. One commonly thinks of the Titanotheres as resembling rhinoceroses most closely, perhaps because the family soon took to wearing horns on their noses, but the Titan-Beasts had some anatomical points in common with horses and tapirs as well.

Tremendous Nose-Horns

Through the ages they grew in size, and as they got up in the world they began to "put on style," especially in the matter of horns on the nose. These began as low, blunt points, but finally reached proportions that would put the great polished spear of the modern Indian rhinoceros to shame. One Asiatic Titan-Beast developed a veritable nasal battering-ram, almost as high as his head was long.

A notable thing about these horns was that they grew in pairs, side by side, instead of in tandem, one in front of the other, as in the present-day two-horned rhinoceros. Whether these formidable nasal weapons were of any use to the animal except in fighting there is no present way of knowing.

Bigger and bigger grew the evolving Titan-Beasts, until at last the largest American species was a fourth higher at his shoulders than the largest existing Asiatic rhinoceros; and he was correspondingly heavier in the body. Standing as high as the average (though not the largest) Indian elephant, he must have been a great deal heavier, because his legs were relatively shorter, like those of a rhinoceros. He has been named *Brontotherium*, which means Thunder-Beast.

Then, having reached the climax of their bulky majesty, treading in apparent security on an earth that was theirs for

ever—they vanished swiftly and completely. Not the remotest direct descendant of a Titan-Beast is left alive today.

The search for Titan-Beast remains in Asia led to the discovery of an even more tremendous animal, the largest mammal that ever walked the earth, so far as we know today. This was the towering monster known as *Baluchitherium* in English, the Beast of Baluchistan, a giant more than double the height of the Thunder-Beast *Brontotherium*.

Baluchitherium was first discovered by a Cambridge University scientist, Dr. C. Forster Cooper. Visiting the American Museum as a graduate student, he was inspired by the bold vision of Prof. Osborn to go hunting extinct giants in the difficult mountain country through which the armies of Alexander the Great had once had such a tough time making their way. He knew he would be taking a chance of getting sniped at by Afghan tribesmen (they don't like strangers, and they are devilish good marksmen), but being a proper Englishman he was willing to take a sporting chance.

He was correspondingly rewarded. From the hills of Baluchistan he brought out the most enormous mammal bones anybody had ever seen. One, the axis-bone of the great beast's neck, formed a camel load all by itself.

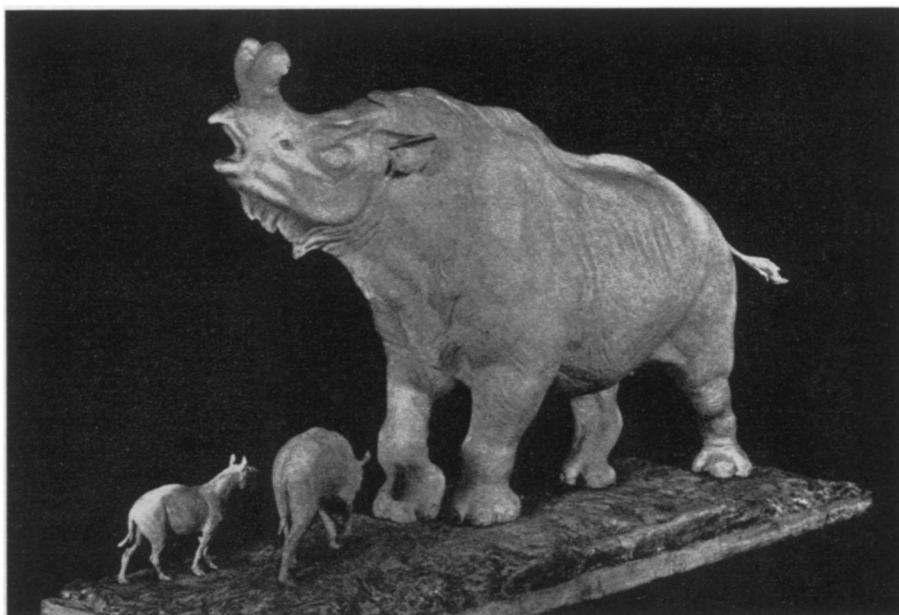
Dr. Forster Cooper at first called his mountainous mammal *Thaumastotherium*, which means "Wonder-Beast." But he found that another scientist had already given that name to a different animal. So he called it *Baluchitherium*, in honor of the land where he had found it. For its second or specific name he called it *osborni*, dedicating it to the American scientist who had set him on his great adventure. Subsequently more bones of the same kind of animal were found in the Gobi Desert by expeditions of the American Museum.

Baluchitherium is not one of the Titan-Beasts, though it belongs in the same general animal cousinship. It seems to have developed only in Asia, and its race either did not last long or (more probably, really) its family history is as yet quite imperfectly known. It seems to have been rather more like the rhinoceroses than were the Titan-Beasts.

A Synthetic Monster

Recently Dr. Gregory, with the skilled assistance of a woman artist, Mrs. Helen Ziska, took all the bones of the Baluchistan Beasts he could get—some 200 of them, from several different animals—and made a new study and restoration.

The job was complicated by the fact



GROWTH BEFORE DESTRUCTION

The Titan-Beasts began little and grew big, in the course of the ages. Then they died off. This model is at the American Museum of Natural History.

that no two of the animals had been of the same size, so he had to calculate them to a common standard by endless measurements and computations. Finally, at the end of a couple of years of labor, he could set forth his results: the biggest *Baluchitherium* stood no less than seventeen feet nine inches high at his shoulders! This tops the head of the biggest extinct elephant by four and a half feet, and the horn-tips of the modern giraffe by a foot and three-quarters. The great animal is estimated to have weighed as much as 100 grown men, and to have required 500 pounds of food every day. Perhaps it is just as well that there are no living specimens for zoos or circuses to support, in these tight times.

Biggest Land Mammal

Baluchitherium was not the biggest animal that ever lived. The biggest of all animals is living today—the modern sperm whale. Nor was he the biggest land animal that ever existed. Some of the dinosaurs were bigger; though it has been conjectured that these immense reptiles, extinct millions of years before his time, stayed in the water a good deal and thus got part of their weight held up free of charge.

But *Baluchitherium* was without question the largest of land mammals we know anything about, living or dead. He was the largest of warm-blooded creatures that ever went on four feet. That should be distinction enough.

Like the Titan-Beasts, this great Beast

of Baluchistan vanished from the earth swiftly—even abruptly, so far as the known geological records show. What could have done such unconquerable giants in so quickly and so completely?

One guess is as good as another. They had nothing much to brag of in the matter of brains, for one thing. Perhaps when times got bad they did not have sense enough to adapt themselves to new ways, and went the way of all conservatives in all revolutions. Or perhaps they were suddenly hit by some devastating disease. Being so big, there probably never were very large total numbers in their herds, so that a single severe epidemic may have set them on the road to the vanishing point.

Whatever may have been the cause, they went. Like the huge dinosaurs before them, they give new and emphatic point to that most puzzling of evolutionary phenomena—the Non-survival of the Biggest.

Science News Letter, June 8, 1935

The restoration painting reproduced on the cover of this issue of the SCIENCE NEWS LETTER was made some time ago by Charles R. Knight, under the direction of Prof. William K. Gregory. Subsequent researches have necessitated some modifications in detail, though the main outlines are correct. See also SNL, April 13, p. 231.

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Cornell University states that only apple varieties of high dessert quality, such as McIntosh, justify the risk and expense of transplanting.