

The Rise & Fall of the Terror Birds

AFTER THE DINOSAURS, A NEW PREDATOR
REIGNED IN SOUTH AMERICA. FOR A WHILE.

by Charles C. Hofer

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elcome to Florida . . . 3 million years ago. One day this land will be dominated by gentle breezes, palm trees, and grandparents. But today, it is ruled by a terrifying beast.

This monster stands taller than a basketball hoop. It has an enormous razor-sharp beak that can slice through flesh and crack bones. If it lays eyes on you, there's little point in running away. Long, strong legs make it one of the fastest animals on land. Its speed and strength are rivaled only by its appetite for fresh meat. This creature is *Titanis walleri*, the largest of all terror birds.



Terror birds (family *Phorusrhachidae*) were gigantic, flightless birds that rose to the top of the food chain after the Cretaceous Period came to a close. For more than 60 million years, terror birds ruled the roost as a top predator. Then they disappeared.

The rise and fall of the mighty terror birds is a story about a change. It's a story about evolution's winners and losers. And the terror birds were big, big winners... until they weren't.

A Changing Planet

Like most of today's plants and animals, the story of the terror birds begins in the Cretaceous Period. Life on Earth changed a lot during the Cretaceous. The huge land mass of Pangaea split apart. Over millions of years, the Earth's plates moved inch by inch through the process of continental drift. Eventually the continents of Asia and North America and Africa formed. However, land bridges still connected these giant landmasses, allowing plants and animals to move back and forth between the new continents.

Meanwhile, continental drift also moved the landmass that would become South America. Unlike the other continents, South America remained as an island. By the end of the Cretaceous, about 66 million years ago (mya), South America was completely isolated from the rest of the world's plants and animals. The continent was about to become evolution's grand experiment.

At the end of the Cretaceous another life-altering event occurred. A giant asteroid slammed into Earth, crashing near what is today Mexico. Temperatures across the planet changed. Ecosystems collapsed. Earth's dominant life form—the dinosaurs—could not adapt to a changing climate. The giant lizards slowly died out.

With the dinosaurs out of the way, mammals evolved and diversified, becoming Earth's top dog—at least in places like North America and Asia and Africa. South America, however, was an entirely different story. Large, meat-eating mammals like cats and dogs never evolved. This left a giant, bird-sized opening at the top of the South American food chain.



A terror bird would have been more than 3 feet (1 m) taller than an adult human.

The Kings of South America

In every ecosystem, all organisms—from plants to animals—have an ecological niche. This is the biological role the organism plays in its ecosystem. For example, in a typical forest, some small birds might feed on seeds and berries that grow on plants. Other birds might feed on insects. Still other birds might feed on rodents like mice and rats. Each of these birds plays a role in its ecosystem. Each has a niche.

Most of the time, no two organisms can occupy in the same niche. There just aren't enough resources like food to go around. As a result, there will be winners and there will be losers. Some will survive while others will go extinct.

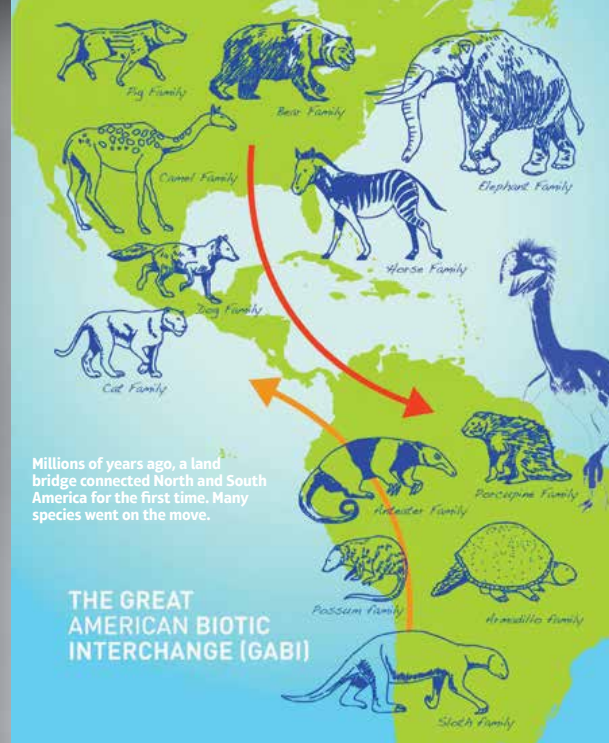
During the late Cretaceous, before the giant meteor crashed into Earth, smaller dinosaurs called theropods occupied the niche of ground-dwelling meat eaters in South America. Theropods such as the velociraptor were fast runners with long legs and sharp teeth. They fed on animals like mammals, which were still small and timid creatures during the age of dinosaurs.

When theropods and other dinos went extinct, all kinds of ecological niches

were left vacant. Many new species of animals evolved, diversified, and took advantage of these open niches. Scientists call this "adaptive radiation." This is when an organism evolves into new forms when changes to the environment make new resources available.

In the Americas, adaptive radiation took two very different courses. In North America—now a dinosaur-free zone—mammals soon moved into the vacant ecological niches, thanks to adaptive radiation. Mammals of all shapes and sizes evolved and dominated the landscape in North America. Within a few million years, large carnivores like sabre-tooth cats, dire wolves, and bears lived alongside smaller meat-eaters like weasels and foxes and bobcats. Large mammalian predators ate their way to the top of the food chain.

Meanwhile, on the island of South America, another type of animal was taking advantage of the empty niches created by the mass extinction event. "Just like mammals, some bird species survived the event," says Richard Hulbert with the Florida



Museum of Natural History. "Then they evolved rapidly into many diverse species."

Some of these birds evolved to be large—very, very large. These new "terror birds" assumed the theropod's ecological niche as South America's dominant ground-dwelling carnivore.

Big Birds

Fossils of terror birds were first discovered in 1887 in the mountains of southern Argentina. Since they were first identified, more than 20 species of terror birds have been recognized. Some species of *Phorusrhachid* stood about 3 feet (1 m) tall. Other terror birds, however, towered more than 10 feet (3 m) and weighed nearly 1,000 pounds (about 450 kg)! For comparison, a mature ostrich stands about 9 feet tall (2.7 m) and weighs a little more than 300 pounds (136 kg).

Terror birds were successful predators for many different reasons. With long and powerful legs, terror

birds were able to run up to 50 mph (80 kmh). Giant clawed toes probably helped terror birds pin down squirming prey. The predator probably wielded its huge beak like a club to bludgeon its prey senseless. Then, the giant beast might have picked up its prey and slammed into the ground, killing it. How do scientists know this? From watching modern birds. Today, birds with similar physical characteristics, such as the red-legged seriema, do the same to their prey.

Paleontologists are unsure about the social lives of these big birds, however. Did they live and hunt in groups, like today's lions in Africa? Or were they solitary animals, stalking their prey alone, like the secretive jaguar? Their brain might have the answer. "Brain size in social animals is greater than in solitary ones," says Hulbert. "[Terror birds] do not appear to have had especially large brains. Their rarity also suggests they did not live in large groups."

Beginning of the End

In the isolated world of South America, terror birds had it good... really, really good. But by the Pliocene Epoch, around 3.5 mya, the world was changing once again. The climate began to warm. Sea levels dropped. Soon, a narrow strip of land rose from the sea, in what today is Panama in Central America. Suddenly, North and South America were connected by a land bridge. The Great American Biotic Interchange was underway: species roamed from one continent to another. South America was about to get very crowded.

With the formation of the Isthmus of Panama, carnivorous mammals from North America moved south. Wolves and big cats and other smaller meat-eaters chomped and clawed their way into South America. The sudden exchange of life between the continents caused massive shifts in communities. Ecological niches changed almost overnight. One by one each species of terror bird died out, outcompeted by the furry invaders from the north.

It wasn't a total loss for the terror birds, though. As part of the Interchange, the biggest and baddest of all terror birds, *Titani walleri*, moved into North America. It flourished in what is today Florida. *T. walleri* was tough enough to compete with bears, wolves, and big cats in the area. For a while at least. Eventually, time—and competition—caught up to *T. walleri*. The diversity of other predators it had to compete with probably pushed *T. walleri* into extinction.

Some specimens recently recovered in Florida are believed to be about 1.8 millions years old. After that, *T. walleri* and all other terror birds vanish from the fossil record. With the extinction *T. walleri*, the long and bloody reign of the terror birds came to an end. Mammals would become the Earth's dominant life form.

Charles C. Hofer is a writer and biologist living in southern Arizona, home to an amazing diversity of birds. He is very happy he doesn't have to worry about running into a 10-foot tall meat-eating bird, though.