**How Was Spinosaurus Discovered?**

A Fossil History of the World's Biggest Carnivorous Dinosaur

By [Bob Strauss](http://dinosaurs.about.com/bio/Bob-Strauss-36886.htm), About Education

If you were to direct a movie about the fossil history of [Spinosaurus](http://dinosaurs.about.com/od/typesofdinosaurs/ss/10-Facts-About-Spinosaurus.htm), the first scene would be set in the flaming Egyptian desert, during the golden age of European colonialism, In 1912--two years before the outbreak of World War I--industrialized nations like Germany thought nothing of sending their scientists to far-flung places, from whence they obtained (some would say stole) cultural and historical treasures.

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On an expedition to the Bahariya Formation of western Egypt, a fossil-hunter named Richard Markgraf discovered the partial remains of an enormous theropod, including bizarre-looking structures called "neural spines" that jutted out from this dinosaur's vertebrae. Markgraf shipped the bones back to Germany, where the venerable paleontologist [Ernst Stromer von Reichenbach](http://dinosaurs.about.com/od/famouspaleontologists/p/ernststromer.htm) assigned them the new genus and species *Spinosaurus aegypticus* (aka the "Egyptian Spine Lizard.")

**Enter the "Moroccan Spine Lizard"**

It's not true, as many people believe, that Spinosaurus was reconstructed solely on the basis of Markgraf's find. Over the next couple of decades, Von Reichenbach found himself in receipt of additional Spinosaurus-like fossils from elsewhere in northern Africa, though none of them were as impressive as the Bahariya "type fossil." They did, however, impel von Reichenbach to erect a new species, *Spinosaurus maroccanus* ("Moroccan Spine Lizard"), which differed in slight respects from its Egyptian counterpart.

Even given the fate of the *Spinosaurus aegypticus*specimen, the validity of *S. maroccanus* is on shaky footing. Today, most paleontologists believe that these fossils should properly be assigned to the closely related spinosaur genus[Carcharodontosaurus](http://dinosaurs.about.com/od/carnivorousdinosaurs/p/carcharodont.htm) ("Great White Shark Lizard") or the much more obscure, and even harder to pronounce, Sigilmassasaurus. Dale Russell--famous for his speculations about what might have become of [Troodon](http://dinosaurs.about.com/od/typesofdinosaurs/a/Troodon-Facts.htm) if not for the K/T extinction--continues to believe in the validity of *S. maroccanus*, though he's in the distinct minority.

**Spinosaurus aegypticus, Casualty of War**

The original fossils on which von Reichenbach constructed *Spinosaurus aegypticus* were deposited after World War I in the Bavarian State Collection of Paleontology, in Munich--and were destroyed in a British bombing raid on that city on April 24 and 25, 1944. (This was rather late in the war, after Germany had, to all intents and purposes, already been defeated.) Fortunately, like any good paleontologist, von Reichenbach left detailed drawings of the specimens and at least two photographs, so in a sense the "type fossil" remains available for analysis.

What actual fossils of Spinosaurus are still extant? Here's a brief list of the best-attested fragments:

The Canadian Museum of Nature has a seven-inch-long vertebra, complete with neural arch, that was indispensable in the naming S. Maroccanus.

The Museum National d'Histoire Naturelle, in Paris, is in possession of a five-inch-long Spinosaurus snout fragment discovered in Algeria.

The Museo di Storia Naturale di Milano, in Italy, has an unusually large (almost 40 inch) snout fragment, eight times as long as the Paris specimen above.

The Office National des Mines, in Tunisia, is where you'll find an even smaller dental and jaw fragment discovered in that country.

Closer to home, the paleontological collection of the University of Chicago contains two Spinosaurus nasal bones joined by a "fluted crest," measuring about seven inches long.

**Why Did Spinosaurus Have a Sail?**

Given all this talk of "type fossils," fragments of snouts and fluted crests, it's easy to lose sight of Spinosaurus' most notable feature: the long neural spines jutting out of its vertebrae. Initially, Ernst Stromer von Reichenbach interpreted these as having supported a big lump of fat, much like the hump of a modern camel. (At least one dinosaur, [Ouranosaurus](http://dinosaurs.about.com/od/herbivorousdinosaurs/p/ouranosaurus.htm), is believed to have sported this feature, which would have enabled it to survive in arid climates).

In recent years, though, the weight of opinion is that the neural spines of Spinosaurus supported a thin sail along this dinosaur's back, rather than a thick hump. That said, the purpose of this sail remains a mystery; it may have been a sexually selected characteristic (that is, males of the genus with bigger, more prominent sails had more success mating with females), or they may have been evolved to help Spinosaurus regulate its temperature. Want to know more? See this in-depth article, [Why Did Spinosaurus Have a Sail?](http://dinosaurs.about.com/od/dinosaurcontroversies/a/Why-Did-Spinosaurus-Have-A-Sail.htm)