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From Many Imaginations, One Fearsome Creature  
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A huge scaly serpent, usually with the wings of a bat or bird. Four or two or no legs. Breathes fire or poisonous fumes. May talk, but won't take guff from mere mortals. Sometimes has a vulnerable underbelly (good luck, Siegfried!) and sometimes is solid armor plate. May guard a treasure. May diet on virgins, or anything that crosses its path, halitosis-barbecued.

Sound familiar? Of course. For everyone from Perseus of Jaffa to Harry of Hogwarts, it's a dragon.

Of all the hoary old monsters, dragons are the most persistent, appearing everywhere from mall crystal shops to Disney movies. Cryptozoologists search for its cousins, the Loch Ness monster and the mokele-mbembe of the Congo swamps.

Dragon images have been found on the Ishtar Gate of Babylon, on scrolls from China, in Egyptian hieroglyphs and Ethiopian sketches, on the prows of Viking ships, in bas relief on Aztec temples, on cliffs above the Mississippi River and even on bones carved by Inuits in climates where no reptile could live.

Now scholars drawing on primitive art, fossilized bones and ancient legends are struggling to explain how cultures that had no contact with one another constructed mythical creatures so remarkably similar. And why did dragons persist so long?

Claw-footed griffins, gentle unicorns and man-eating sphinxes passed into legend relatively quickly, while even educated men clung to belief in dragons at least through 1734, wrote Peter J. Hogarth, author of "Dragons" (Viking, 1979). That year, the Swedish naturalist Linnaeus dismissed a seven-headed hydra on display in Hamburg by saying it was a clever fake concocted of animal parts. Its aggrieved owners, merchants who had bought it from Count von Leeuwenhaupt for the "staggering price of 10,000 florins," drove Linnaeus out of town by threatening to sue, thus puffing a small dark cloud across the dawn of rationalism.

"The new zoology had lost a first skirmish with the old," Mr. Hogarth wrote. But, he concluded, it won every later one.

As a dragon debunker, Linnaeus was unusual. Many earlier assertions that dragons existed came from scientists who speculated on how birds could mate with lizards or whom the monstrous skulls turned up in European caves and Chinese canal projects belonged to.

They include writers like the Roman naturalist Pliny; the Jesuit scholar Athanasius Kircher, who wrote "Underground World" in 1665; and Edward Lhwyd, keeper until 1709 of the Ashmolean Museum at Oxford, which is now a respected art museum but began life as a botanist's curio cabinet.

In "An Instinct for Dragons" (Routledge, 2000), Dr. David E. Jones, a professor of anthropology at the University of Central Florida in Orlando, posits a biological explanation that jibes with the Jungian notion of unconscious collective fears. He argues that the dragon image, fermented in the primal soup of man's first nightmares, is a composite of the carnivores who fed on human ancestors when they were tree-dwelling monkeys: the pythons, the big cats and the raptors.

Professor Jones was struck by the idea, he said, while reading about the three-alarm calls of the vervet monkey. The first, for leopards, makes them leap for the treetops. The second, for eagles, makes them duck to low branches, and the third, for snakes, makes them jump.

Obviously, there is quite an evolutionary gap between vervet monkeys and the Sumerians of 5000 B.C., the first people known to have drawn dragons. But Dr. Jones argues that the same elemental fears persist in humans as snake and bird phobias, and he cites as evidence the fact that infant chimpanzees who have never seen snakes are terrified of them.

His theory cannot really be tested, he acknowledged in an interview. Still, he said, for millions of years, "primate brain selectivity was for sensitivity to predators."

Until relatively recently, the question that scholars had asked themselves was not, "Are dragons real?" but rather, "Why don't we see them anymore?"

Pliny, ignoring Greek and Roman mythology, held that "dracos" did exist, but just in faraway India, where he reported that they were large enough to prey on elephants by dropping out of trees and strangling them. Modern naturalists assume that he heard reports of pythons, which not only grew bigger in retelling, but also turned into fish stories. Some dragons, Pliny wrote, had such large crests on their heads they could sail to Arabia to hunt.

Pliny's descriptions — treated as factual — persisted for centuries, turning up in 1608 in an English translation of a German naturalist's work. That just strengthened belief in subsequent legendary dragons, Beowulf's Grendel; Fafner, whose belly was slit by Siegfried; and the Midgard serpent that Thor struck with his hammer. As late as 1420, a battle between Sir John Lambton and the milelong Lambton Wyrme (old English for snake) was reported as fact, and flocks were sighted at London fires.

Throughout the Middle Ages, the devout assumed that dragons existed; the Bible said so. The 300-eyed steam-spewing Jordan-swallowing Leviathan in the Book of Job is a dragon, and so, according to early translations and many medieval paintings, is the creature that tempted Eve. After all, it would be hard for a mere snake to offer an apple while whispering sweet temptations.

The ancients often cited "physical evidence," for which modern scholars offer new explanations.

In 58 B.C., Pliny reported, the "spine of the sea serpent killed by Perseus at Joppa" (modern-day Jaffa) was displayed in Rome. Karl Shuker, author of "Dragons, A Natural History" (Simon & Schuster, 1995), surmises that the monster Cetus, swimming up to eat Andromeda, might have grown out of rare sightings of oarfish, a snakelike fish up to 30 feet long with a coral red head crest. Other scholars theorize that the skeleton might have been one of the sperm whales that once commonly beached near Jaffa. A half-rotted whale, with its jawbones and vestigial leg bones exposed, would look rather dragonlike, they say.

Before Linnaeus played spoilsport, stuffed monsters were routinely exhibited at fairs. An Italian mathematician reported seeing "dragon babies" in Paris in 1557. They may have been snakes with bat wings sewn on.

(Centuries later, P. T. Barnum sewed a dried fish tail to a dried monkey torso and told Americans that it was a mermaid.)

But there is another obvious source for the dragon myth: the bones of dinosaurs and extinct mammals. Bones exposed by storms, earthquakes or digging were well known to the ancients, said Dr. Adrienne Mayor, a professor of folklore at Princeton and the author of "The First Fossil Hunters" (Princeton, 2000). She argues that the myth of gold-guarding griffins arose in the red clay of the Gobi Desert, a landscape literally scattered with white Protoceratops skulls, with parrot beaks and bony neck frills.

Othenio Abel, an Austrian paleontologist, speculated as early as 1914 that the central nasal holes in skulls of prehistoric dwarf elephants were the source for Homer's Cyclops. Abel added that the skulls of cave bears — *ursus spelaeus*, half again as big as grizzlies — could have given rise to tales of dragons.

Medieval Europe is "full of stories of knights fighting dragons in caves," Dr. Mayor said.

Some extinct mammals have startlingly dragonlike skulls, and Asian dragon myths may be based on Pleistocene and Cretaceous fossils, which were at one time universally known as "dragon bones," Dr. Mayor added.

*Sivatherium giganteum*, a huge proto-giraffe, has a pointed three-foot-long skull, and another, *Giraffokeryx*, has four swept-back horns.

Mount Pilatus in Switzerland abounds in pterodactyl fossils, and with stories of fights between men and dragonets — small, scrawny winged dragons.

The head of a dragon sculptured in 1590 by Ulrich Vogelsang for the city of Klagenfurt, Austria, was modeled on a "dragon skull" found by quarrymen in 1335. It is now known to be that of an Ice Age woolly rhinoceros.

Paleontologists can even account for the legend that dragons have jewels in their foreheads. Big calcite crystals form on long-buried skulls.

So, having found the bones of dragons, Enlightenment thinkers were at pains to explain them.

For medieval Christian thinkers, the explanation was simple: God had formed them whole, but let them be wiped out in Noah's flood.

But for pre-Darwinians who realized that many creatures too big to be overlooked were nowhere in the story of Creation and who were gleaning some inkling that species beget other species, it was trickier.

Dragons were clearly a hybrid, part snake, part bird and part bat. In the 17th century, they were explained by the newly popular "spermatick principle," which held that semen formed creatures and that the egg was a mere food source. Sometimes, scholars surmised, sperm from different species could mix and make a monster.

Mr. Lhwyd of the Oxford museum argued that semen from fish and snakes could rise high into the air with evaporation, rain down again and end up in the high aeries of eagles and vultures. In a lucky process called "fermentational putrefaction," the mix could produce a winged snake.

Of course, there are living reptiles that could have inspired dragon myths. Ten-foot carnivorous lizards prowl Komodo island in Indonesia, But Western explorers did not discover them until 1912, and there is no evidence they were known to the ancients.

Marco Polo's "factual" descriptions of Chinese dragons more or less match the large crocodiles once found there. Nile crocodiles, which can grow 22 feet long, still prey on rural Africans while their overseas relatives eat two or three Americans and Australians a year.

But David Quammen, an independent scholar writing a book about the relationship between indigenous peoples and their predators, points out that although draconian crocodiles appear in the mythology of Australian aborigines, dragons are just as common in the myths of Vikings, who might have been eaten by bears, but never by crocs. And dragon lore is rare in Africa, where crocs are common, but predator myths revolve more around lions and hyenas.