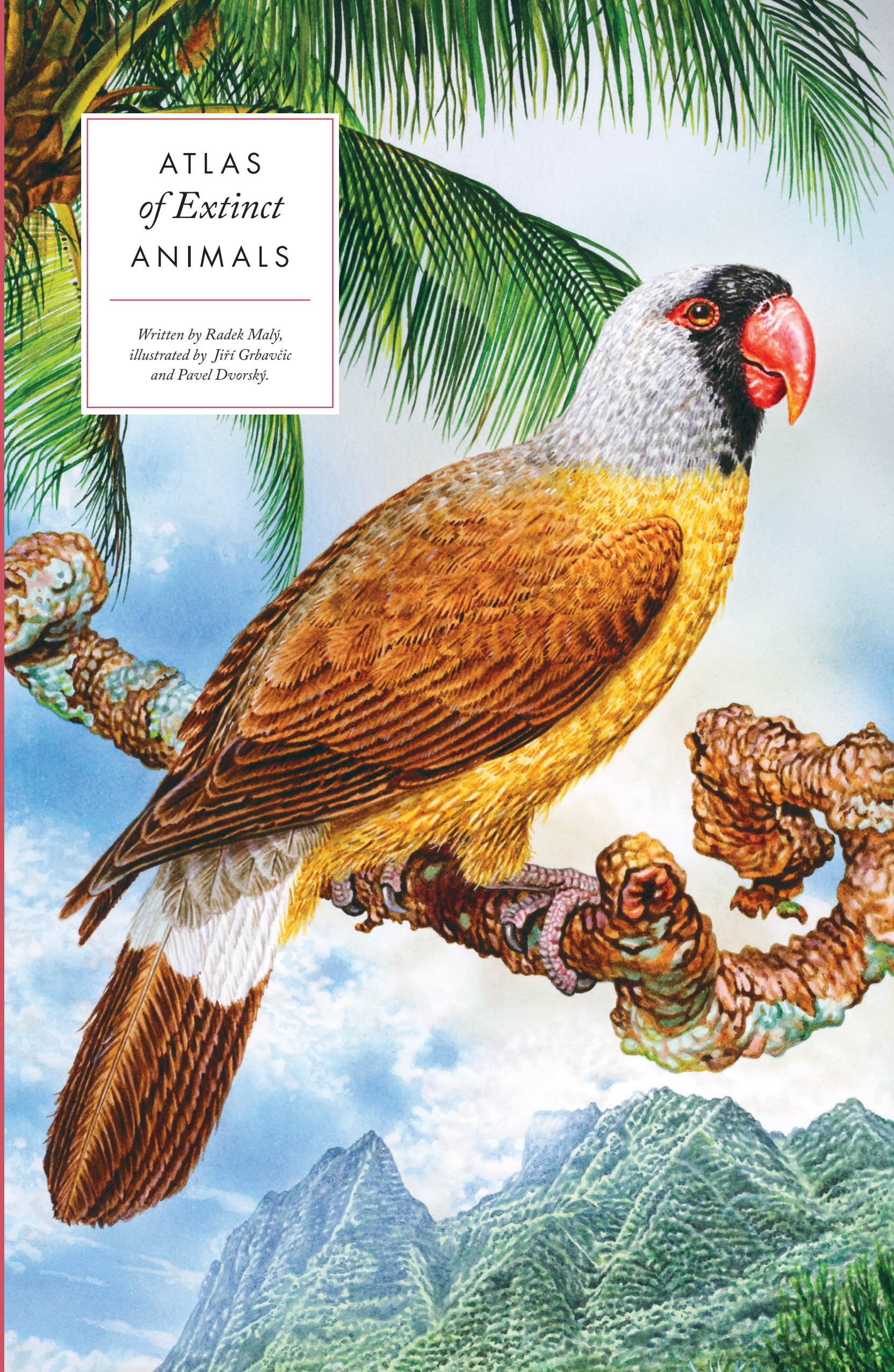


ATLAS *of Extinct* ANIMALS

Written by Radek Malý, illustrated by Jiří Grbavčic and Pavel Dvorský.

Radek Malý • Jiří Grbavčic • Pavel Dvorský

ATLAS *of Extinct* ANIMALS

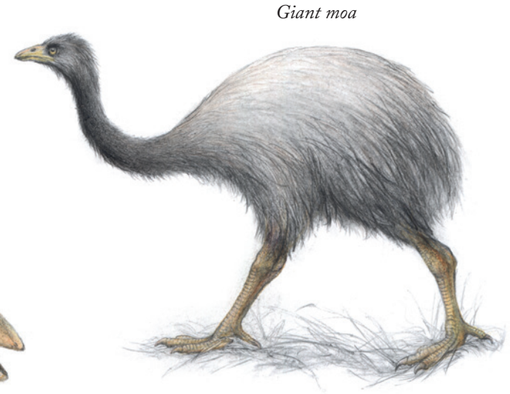
albatros

GIANT MOA

Dinornis novaezealandiae

Gian moa—head

Gian moa—skull



Giant moa

HABITAT: *New Zealand*
EXTINCTION: *circa 1500*

When the first Europeans settled in New Zealand in the early 19th century, they learned from the native Māori people of a huge bird that had once lived on the island. The Europeans considered this bird to be the stuff of legend. In 1839, British palaeontologist Sir Richard Owen took possession—via several middlemen—of a six-inch-long, unusually light fragment of bone discovered in New Zealand. Four years later, he announced to the world of science that it was the skeletal remains of an enormous bird, which he named *Dinornis novaezealandiae*. At the time, Owen was labeled a fantasist and dreamer. More years would pass before he was proved right. After the discovery of more bones, Owen was photographed with a reconstructed giant moa skeleton.

The natural world of New Zealand evolved for millions of years in isolation from the surrounding world. At first, apart from bats, there were no mammals there at all. The place of mammals in the ecosystem was taken by birds, which evolved into many diverse kinds. Moa birds grew to be exceptionally large: the female of the giant moa, the largest species, was nearly 12 feet tall and weighed around 550 pounds, making it the biggest bird Earth has ever known—a kind of New Zealand giraffe. The male giant moa was considerably smaller, which explains why the two sexes were at first thought to be different species. Today, scientists classify the moa into nine species. All moa were herbivores. They fed on grass and the leaves of shrubs and trees. Like Africa's ostrich and Australia's emu, the moa was a ratite: a large flightless bird. But unlike the ostrich, the moa didn't just lose its ability to fly; it lost its wings entirely—there is no sign of wings on moa skeletal remains.

Climate change played a role in the extinction of many prehistoric megafauna. Moa birds, however, were able to adapt to such change. Humankind is solely to blame for their extinction. This time, however, the culprits were not imperious colonizers from Europe but the native Māori, who settled on the island in the 11th and 12th centuries, having arrived from other parts of Polynesia. Until then, the only natural enemy of the moa on the islands of New Zealand had been the massive Haast's eagle. Moa proved powerless against human weaponry. The Māori would decorate themselves in moa feathers, eat moa meat, and use moa eggshells as containers. They also changed the natural landscape of the islands by cutting down trees and burning the forests.

Recent studies have shown that most moa on the islands were exterminated over a very short period (about 100 years). This incredibly rapid process was set into motion by a group of only about 400 colonizers from Polynesia, who took advantage of the easy prey to increase their population and form numerous tribes. Later, the Māori and their unique culture would come perilously close to sharing the fate of the moa. The warriors of different Māori tribes had never enjoyed friendly relations. The arrival of colonizers from Europe presented them with firearms, which became agents of their mutual mass destruction.

According to unverified reports, in certain remote areas of New Zealand, the moa may have lived on into the 19th century. Either way, our only contact with the moa today is through skeletal remains and reconstructions on display in museums. Fortunately, the Māori realized in time that their fratricidal war benefitted only the European settlers; the Māori still live in New Zealand to this day.

AUROCHS

Bos primigenius

Aurochs

Skull

HABITAT: *Europe, Asia, and northern Africa*
EXTINCTION: *1627*

A wild ancestor of today's domestic cattle, the aurochs once lived over a vast area. In certain ancient cultures, it was a subject of religious worship; for instance, the Assyrians, the Babylonians, and the Egyptians considered it a symbol of strength, power, and grandeur. But neither this great status nor the later ruling that it could be hunted only by royalty spared the aurochs from extermination at the hands of humans.

By now we have a pretty good idea what it looked like. Archaeologists have reconstructed around 15 complete skeletons and even found remnants of hair. We also know about the aurochs from Stone Age paintings: it was commonly hunted by the Neanderthals and, later, by modern humans. A massive creature, the bull weighed up to a ton, the cow considerably less. For winter, its short smooth coat thickened and became longer. Bulls were black, cows and young a reddish-brown color. Its massive, lyre-shaped horns were a striking feature.

The diet of the aurochs consisted primarily of grasses and other herbaceous plants, acorns, and leaves. Its adaptable, undemanding nature allowed it to live in various habitats, from woodlands to steppes, from lowlands to high mountains. Climate change drove it from many of its places of origin, however. Human intervention in the landscape brought about further restrictions in its living space. Humans also succeeded in domesticating the aurochs into the cattle we know today, although it took quite a long time. The journey began in valleys of the Euphrates and Tigris Rivers almost 11,000 years ago. Domestic cattle reached Central Europe via Turkey and Southern Europe about 8,000 years ago.

The aurochs died out first in Egypt, then in Mesopotamia, as a result of both climate change and hunting. It was still found in Southern Europe in the 1st century CE; it often appeared in Roman arenas in gladiatorial combat. Intensive hunting brought about its gradual disappearance in Southern, Western, and Central Europe, until it survived only in a small, protected population in a royal enclosure in the village of Jaktorów, Poland. The last aurochs—a female—died in Jaktorów in 1627.

In the 20th century, several attempts were made to resurrect the aurochs and reintroduce it into the wild. Zoologists and scientists hope to breed back cattle akin to original auroch populations, complete with their role in the ecosystem. The first attempts were made in Germany, by brothers Lutz and Heinz Heck—albeit independently of one another. (The former was director of the zoo in Berlin, the latter his counterpart in Munich.) Heck cattle, the result of the Heck brothers' experiments, differed from the aurochs in many ways, however. Tauros, the most recent project for resurrecting the aurochs, began in the Netherlands in 2008. Tauros's first herd in Central and Eastern Europe was established in 2015, on the grounds of a former military base in Milovice in Central Bohemia. How the modern aurochs will cope with its European habitat and the habitat will cope with the aurochs remains to be seen.

GREAT AUK

Pinguinus impennis

Great auk

Great auk—skull

Great auk—egg

HABITAT: *coastlines and islands of the North Atlantic*
EXTINCTION: *1844*

It is as though these penguin-like water birds, which were clumsy on dry land, were predestined to delight others. Archaeological findings have shown that great auks once inhabited a vast territory reaching from Russia to Spain. Wall paintings of great auks 35,000 years old were found in the El Pendo cave in Spain. Their bones have been discovered in the graves of Native Americans, in whose culture the great auk probably played a major role. Neanderthals, Native Americans, Inuits, and Vikings hunted them for their meat, fat, feathers, and eggs. Although whole colonies of great auks were destroyed by polar bears, their fate was sealed by humans in modern times.

The great auk may not have been a relative of the penguin, but it had a similar way of life. It stood about two and a half feet tall and weighed around 11 pounds. The great auk's undersized wings made flight impossible but served it well underwater—auks were able to dive to depths of half a mile and could hold their breath for over 15 minutes. They lived in colonies with other sea birds and fed on fish. Once a year they laid one egg on bare rock. They had a distinctively large, grooved beak and a white patch in front of one eye, which disappeared outside the breeding season.

By the time modern Europeans discovered the great auk, it inhabited only some islands in the Atlantic, living on rocky coastlines that were reached easily from water. During long expeditions at sea, great auks provided sailors with a convenient source of food; they were even stored alive on board. In the 16th and 17th centuries, mass fishing-boat expeditions would raid auk colonies and bear away hundreds of thousands of eggs. Because of over-hunting and because beasts of prey were increasingly able to reach the great auk's nesting grounds from the ice, great auks rapidly declined in number. What's more, the few islands they came to inhabit often saw the introduction of rats, against which they were defenseless.

By the end of the 18th century, great auks were so rare that private collectors and museums began to take a keen interest in their eggs. As the auks became fewer and fewer, hunting them became a highly profitable business. A last few dozen pairs lived in relatively safety on the rocky island of Geirfuglasker—"Great Auk Rock"—near Iceland, which was inaccessible to boats and beasts of prey. But then nature turned against the auk. In 1830, the island was destroyed by a volcanic eruption, forcing the birds to resettle on the nearby island of Eldey, which was accessible to humans in boats, who tracked them down. On June 3, 1844, three Islanders named Sigurdr Islefsson, Jon Brandsson, and Ketil Ketilsson found a breeding pair of great auks. The first two men bludgeoned the birds to death and the third trampled on their egg. Those birds were the last of their kind.

Several later sightings of the great auk were reported, but none were confirmed. There is no shortage of relics—worldwide, museums have preserved 75 eggs, 24 skeletons, and 81 stuffed skins. One of these stuffed birds was sold at auction in 1971 for over $12,000, setting a world record in its category.

As if in recognition of their shame, humans named a prestigious American magazine for ornithologists *The Auk*, and they also built a statue of the bird on the island of Eldey. Sigurdr, Jon, and Ketil are still waiting for a statue of their own.

THYLACINE

Thylacinus cynocephalus

Thylacine

Thylacine—skull

HABITAT: *Australia, Tasmania and New Guinea*
EXTINCTION: *1936*

The thylacine, sometimes known as the Tasmanian tiger because of the stripes on its back, was a fascinating creature. A marsupial, it had nothing in common genetically with canids, yet it resembled them in terms of appearance and way of life. The story of its fate is fascinating too: it was eradicated by humans in several locations.

The thylacine was about six feet long, including its tail; it weighed between 45 and 65 pounds. Along with the Tasmanian devil, it was one of only two large carnivorous marsupials to survive to the modern day. (The Tasmanian devil still exists.) It specialized in the night-time hunting of small marsupials and birds, probably relying for orientation on its keen sight and hearing. It was one of few species of marsupial whose male, too, had a pouch. As the thylacine wasn't a very fast runner, it probably ambushed its prey or tired it out over a long chase. It could jump on its hind legs like a kangaroo, and it is said that it was even able to stand upright for short periods. Although it could open its jaws at an incredible 120-degree angle, it did not have an especially strong grip.

The first humans to encounter the thylacine were Australian aborigines, who came to the continent about 50,000 years ago, when there was a land bridge with Asia via New Guinea. Although humans hunted the thylacine, the wild dog known as the dingo—which arrived in Australia 5,000 years ago with new settlers from Southeast Asia—probably caused it far greater harm. The dingo represented a powerful competitor for the thylacine: it occupied the same territory, and it was better equipped for survival in terms of evolution. European settlers in Australia never encountered the thylacine—by the time of their arrival, it had been absent from the country for 2,000 years, living only on the much smaller island of Tasmania.

Tasmania was discovered for Europeans in 1642 by Dutch navigator Abel Tasman, who called it "Van Diemen's Land." Tasman referred to thylacines in his descriptions of the locality as "wild animals with tiger's claws". The first detailed description was made by French naturalist Jacques Labillardière on May 13, 1792. Following the establishment of a permanent settlement on Tasmania in 1803, farmers, fearing for the safety of their sheep, began to kill the thylacine systematically. It also succumbed to diseases that were new to it, changes in the environment, and the eradication of animal species it hunted, such as the Tasmanian emu. Rewards for the shooting of thylacines made hunting them a lucrative business; over 2,000 of them were killed in this way. It's no wonder that the number of thylacines in the wild declined rapidly. Although their protection was recommended in 1928, by that time there was nothing left to save. It is known that on May, 6, 1930, on the northeast corner of the island, farmer Wilf Batty shot one of the last surviving thylacines in the wild.

In 1933, a single thylacine, the last known member of its species, was captured and handed over to the Hobart Zoo, where it survived in adverse conditions until September 7, 1936. There is a one-minute-long film of this creature, named Benjamin. Just two months before Benjamin's death, the Tasmanian government placed the thylacine under official protection.

As though refusing to accept the blame for the species' extinction, humans continue to search on the island for thylacine tracks. Again and again there are unconfirmed sightings of the animal, supported by poor-quality video recordings and blurred photographs. Failure to find the thylacine in the wild has led to attempts by scientists to clone it. In death, the thylacine has become a symbol of the island, even appearing on the Tasmanian coat of arms and the label of the local beer. The thylacine has come to share the fate of the aboriginal Tasmanian human population, which, in the 19th century, was likewise tragically decimated by European settlers.

GOLDEN TOAD

Incilius periglenes

Common toad

Golden toad—male and female

HABITAT: *Costa Rica*
EXTINCTION: *1989*

The mountainous Central American nation of Costa Rica stretches from the coast of the Atlantic to the coast of the Pacific. It was in the Costa Rican rainforest in 1964 that American herpetologist Jay Savage discovered a new species of amphibian—a fascinating orange toad that certainly merited being called "gold." But humanity didn't rejoice in this creature's existence for long: it was sighted for the last time in 1989. Its demise was most likely brought about by fluctuations in the local climate.

This toad differed from other members of its family in many ways. Most notably, it developed a distinct dimorphism—meaning the male and the female were very different in appearance. At about two inches long, the more numerous male was about five millimeters longer than the female; the former was orange, the latter a blue-black color with orange spots. The golden toad was observed only shortly after the rainy season, in its breeding period, when all amphibians look for water in which to lay their eggs. Here, males would fight each other for the chance to mate with females, of which there were considerably fewer. The entire golden toad population inhabited a rainforest territory of less than one and a half square miles, located north of the town of Monteverde. In the early 1980s, there were still up to 1,500 golden toads by small pools in this area.

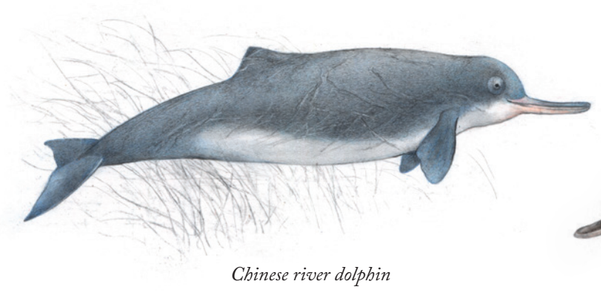
This species of toad was dependent on humidity and the regular flooding of its pools, by which it maintained its position high above sea level. In 1986 and 1987, however, the region was subject to such severe drought that the pools dried out before the tadpoles could transform into adult toads, with catastrophic consequences. A count in 1988 found only ten golden toads; May 15, 1989 was the day of the very last sighting of the golden toad. Its extinction was probably completed by an infection from a fungus that thrives in very dry conditions and continues to threaten amphibian populations all over the world. Investigations in the terraria of zoos failed to turn up any more golden toads. In 2007, the golden toad was added to the list of extinct species.

Based on an analysis of wood samples from the territory once inhabited by the golden toad, scientists at Columbia University recently ascertained that the drought of the later 1980s likely resulted from a complex climatic phenomenon known as El Niño, which consists of the interaction of currents from the Pacific and the atmosphere and the resultant effect on the weather of the whole planet. When the rain at last returned to Costa Rica after the great drought, it delivered another calamity, wrought by accumulated compounds from the pesticides used by the natives on their lowland plantations in the mountain fog. Already weakened by the drought, the golden toad was poisoned by these compounds as it absorbed them through its skin.

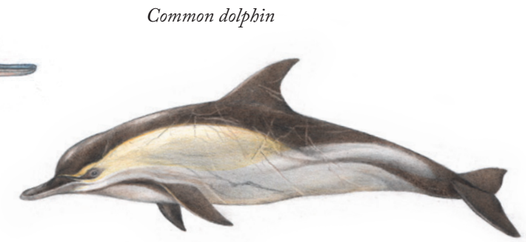
Whether humans were the sole culprits in the eradication of the golden toad remains unclear—we don't yet know whether human activity played a role in increasing the intensity of El Niño. But we know one thing for certain—if we wish to see a golden toad today, we must seek it out in photographs or rare video recordings.

CHINESE RIVER DOLPHIN

Lipotes vexilifer



Chinese river dolphin



Common dolphin

HABITAT: *Yangtze River*
EXTINCTION: *2007*

The power of evolution seems to know no bounds. Can we have any idea how long it took early even-toed ungulates (probably the closest relatives of today's hippopotamuses) to adapt to an aquatic environment before, as today's cetaceans, they came to master the vast ocean plains? They include the blue whale, the largest creature that has ever lived on our planet, and the dolphin, whose intelligence compares in many ways that of humans. Until recently, when the activities of humans caused it to die out, the Chinese river dolphin was one of the lesser-known cetacean species. The expansive force of humans, too, seems to know no bounds.

In China, the Chinese dolphin, one of four species of river dolphins, is known as the *baiji*. Compared to oceanic dolphins, its jaws were narrower and more elongated, its dorsal fin was less pronounced, and its sight was much weaker. As it lived in murky water, it was guided almost solely by echolocation, a kind of animal radar used by bats, for instance. Its bluish-gray body was about eight feet long, it weighed around 300 pounds, and it could reach speeds of nearly 40 miles per hour. The baiji inhabited the Yangtze, China's biggest river, in groups of between 3 and 10 individuals, feeding largely on fish.

The baiji had an important position in Chinese culture, as one of its ancient nicknames—"Goddess of the Yangtze"—testifies. It was considered a symbol of peace and prosperity and is connected with some beautiful legends. It is said that it embodies a princess who was drowned by her own family for refusing to marry a man she didn't love. It was first mentioned in a Chinese encyclopedia around 200 BCE; it is estimated that at this time there were still about 5,000 of these dolphins in existence. In 1978, by which time this dolphin was obviously an endangered species, a research center devoted to it was set up at the Chinese Academy of Sciences.

The decline in its numbers was caused largely by the huge-scale industrialization of China of the 20th century. More river pollution, overfishing, an increase in noisy ships that disorientated the dolphins and crushed them in their propellers, plus other "human factors," meant that we could only watch from the sidelines as this unique species was driven to extinction. The fundamental changes in the landscape were supplemented with a further cruel detail: in the late 1950s, a factory opened on the Yangtze River for manufacturing handbags from this dolphin's skin. Although baijis were placed on the list of endangered species in 1979, their numbers dwindled—until, in 1990, only 200 individuals were left in the wild. A further turning point was reached with the building of the huge Three Gorges Dam in 1994. In 1998, a mere seven baijis were counted in the Yangtze.

In 2005, after attempts to breed these dolphins in captivity failed, a bold but foolish plan to save them was hatched: surviving individuals would be moved by helicopter to the Tian-e-Zhou Oxbow Nature Reserve, whose oxbow lake is connected with the Yangtze River and where calmer conditions prevail. A subsequent expedition equipped with state-of-the-art technology was unable to find a single baiji in the river. Since 2007, this Chinese river dolphin has been considered extinct. Although there are still occasional reports of sightings, it is practically out of the question that lone individuals would be able to find and breed with each other.

So, while whalers and international organizations fought over quotas for whales killed in our oceans, the Chinese river dolphin became the first cetacean in modern history to die out. Unfortunately, humans have yet to learn their lesson from the sad end of the Goddess of the Yangtze.

Stories of creatures eradicated by humankind, and the people who did it.

Humanity is currently living through the sixth mass extinction event in Earth's history. In addition to impacting the environment and the evolution of the planet, the dying out of animal species may affect us too—our proud claim to be lords of creation notwithstanding. In this book, award-winning poet Radek Malý sheds light on this alarming fact by telling the stories of selected extinct species and studying the causes of their sad demise. The large-format *Atlas of Extinct Animals* is supplemented with beautifully expressive full-page illustrations by gifted artist Jiří Grbavčic and detailed pictures by renowned scientific illustrator Pavel Dvorský. By losing yourself in this book, you will, in a sense, bring back to life all 41 of its subjects. Give the fate of the Blue Planet some serious thought. It is in our hands.

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