

LEOPARDS, LIKE THE OTHER PROUD MEMBERS OF THE BIG FIVE, STARTED OFF AT THE BOTTOM OF THE EVOLUTIONARY LADDER. ANDREAS SPÄTH UNCOVERS SOME FAMILY SECRETS.

FROM ZERO TO HERO

LIFE AT THE TOP From humble beginnings as weasely creatures, leopards have evolved into powerful predators.

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THEY TOP ALMOST EVERY VISITOR'S TICK LIST. THE BIG FIVE: ELEPHANT, BUFFALO, LION, LEOPARD AND RHINO. Celebrated for their power and beauty, they're the main drawcard and, for many parkgoers, a trip is a disappointment if at least

one of the five isn't spotted. But would you have recognised them on the day they made their first appearance? When the very first ancestors of the magnificent Big Five showed up on the evolutionary scene some 200 million years ago, they weren't quite as impressive.

"The first mammals evolved from mammal-like reptiles," says Deano Stynder, curator of the Cenozoic Palaeontology Collections at the Iziko South African Museum in Cape Town. "They were tiny, shrew-like creatures."

Not exactly a spectacular entrance into the web of life. Their timing was even worse: the planet, both on land and in the sea, was firmly ruled by the dinosaurs. For a very long time, the diminutive mammals remained an insignificant footnote in nature's scrapbook. Only after the dinosaurs died out, about 65 million years ago, did mammals start to expand their geographical range. They grew in numbers and diversity to develop into the dominant group of animals on Earth today.

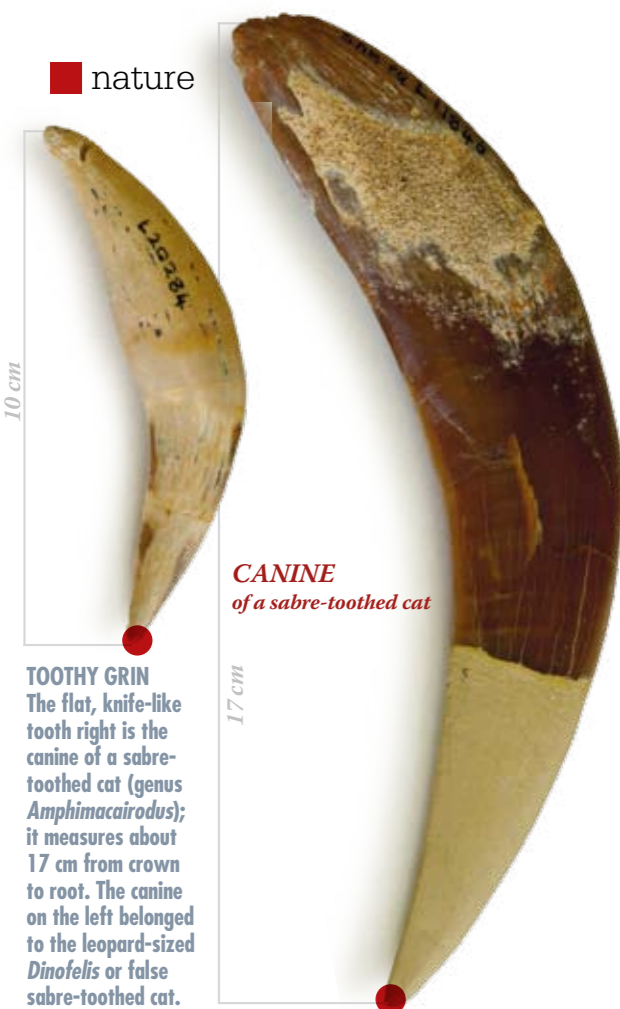
Giant rhinos

Considering their precarious conservation status today, it may come as a surprise that rhinoceroses were once plentiful throughout North America, Europe, Asia and Africa, with a variety of species existing side by side. Among them was the largest land mammal of all time, *Paraceratherium*, a hornless browsing rhino weighing in at as much as 15 tons (that's about three medium-sized elephants!) and measuring over eight metres in length and nearly six metres in height.

The largest land mammal of all time was a hornless browsing rhino.

Rhinos are ungulates, or plant-eating mammals with hooves. More specifically, they are *perissodactyls*, or hoofed mammals with an odd number of toes on each foot. The most primitive lived more than 50 million years ago and were about as big as a modern fox. Rhinos evolved from these distant, hornless ancestors, gradually becoming larger, heavier and developing three-toed, broad feet to support their weight. The appearance of their trademark horns was a comparatively recent addition that is unique among mammals as it is made completely of hair without a bony core.

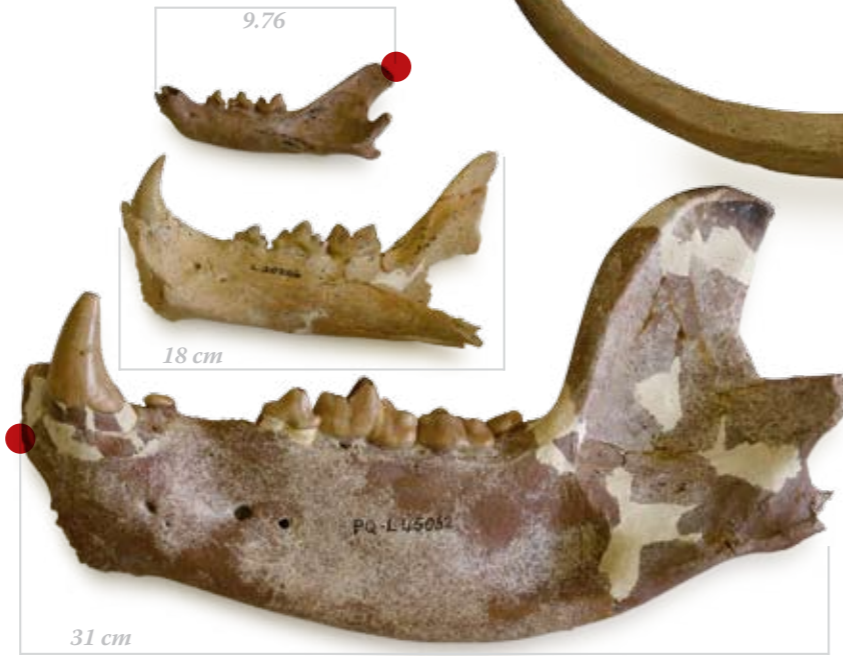
Africa's rhinos are descendants of a branch of two-horned Asiatic rhinoceroses that found its way onto the continent some 10 million years ago. The black and white rhinos of



TOOTHY GRIN
The flat, knife-like tooth right is the canine of a sabre-toothed cat (genus *Amphimacairodus*); it measures about 17 cm from crown to root. The canine on the left belonged to the leopard-sized *Dinofelis* or false sabre-toothed cat.

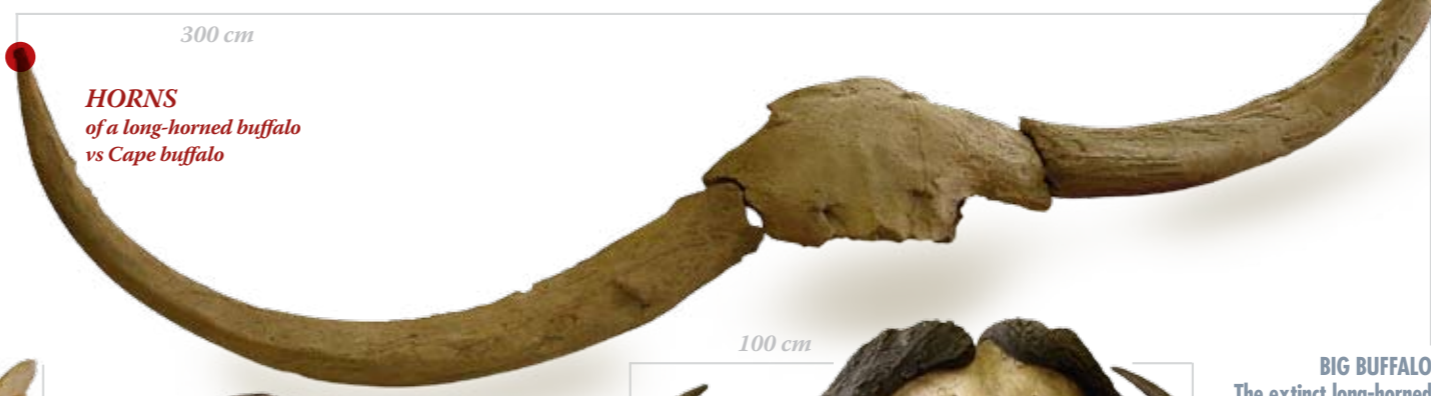
CANINE
of a sabre-toothed cat

JAWBONES
of prehistoric cats and the African bear (bottom)



DEM BONES The jaw at the top belonged to a rookiat-sized cat (still to be named), the middle jaw came from a false sabre-toothed cat, while the jaw at the bottom is that of the African bear (see page 51).

HORNS
of a long-horned buffalo vs Cape buffalo



BIG BUFFALO
The extinct long-horned buffalo *Homoiceras antiquus*, its horns pictured here next to those of a Cape buffalo, roamed across most of South Africa prior to 12 000 years ago.



MOLAR of an African mammoth

JUMBO GNASHER
A molar of the early mammoth *Mammuthus subplanifrons*, which roamed the South African west coast about five million years ago.

today parted evolutionary paths about five million years later.

Ruminating buffalo

Like rhinos, buffalo are hoofed mammals and the two share some very remote relatives. Unlike the rhinos, however, buffalo belong to a group called the *artiodactyls* which have an even number of toes on each foot and many of which evolved a complex, four-chambered stomach. This allows them to ingest large amounts of tough plant matter very quickly, then regurgitate and digest it at a more leisurely pace once they are in a place safe from predators. The original take-away meal. At

A massive long-horned species of buffalo had a horn span of up to four metres and died out around 12 000 years ago.

a time when carnivorous mammals were turning into ever more efficient hunters, this evolutionary innovation gave the buffalo and their ilk – among them deer,

bison, antelopes and giraffe – the edge over their more vulnerable ungulate cousins.

Modern bovine species evolved during the last eight million years, predominantly in the northern parts of Europe and Asia from where they spread south into Africa as recently as two million years ago. Two buffalo species once roamed South Africa, says Deano. The ancestors of the present-day Cape buffalo and a massive long-horned species, which had a horn span of up to four metres and died out around 12 000 years ago.

Elephant survivors

Modern elephants are the last survivors of a group of creatures that once inhabited all the continents except Australia and Antarctica. Large, fossilised elephant bones were prized curiosities among pre-colonial Mexican Indians as well as the ancient Greeks and Romans and may have been the inspiration for numerous legends involving giants and monsters. Many South Africans are familiar with the fact that dassies or hyraxes count among the elephants' few remaining relatives, but DNA studies show the peculiar-looking 'cows of the sea'

– manatees and dugongs – share an even closer ancestry with elephants.

Elephants are *proboscideans*, yet another group of hoofed mammals, whose earliest forebear, a stoutly built, pig-sized creature, lived about 55 million years ago. *Proboscideans* evolved through a complex and busy family tree that included as many as 350 distinct species, most now extinct. The immediate evolutionary ancestors of modern elephants first appeared in Eurasia some seven million years ago. The magnificent mammoths of the great Ice Age, which became extinct as recently as 5 000 years ago, as well as the remaining Asian and African elephants, all share this common root.

"Five million years ago, three species of elephants occupied the west coast of South Africa," says Deano. "The fossil remains of a so-called gomphother, an early mammoth, and an early loxodont elephant have been discovered at the West Coast Fossil Park near Saldanha Bay."

The rise of the cats

Lions and leopards, as well as all other modern meat-eating mammals, are the descendants of a group of small, weasel-

like carnivores who lived about 30 million years ago. Over time, the predecessors of today's big cats grew larger and became extremely adept at killing prey and eating meat. They developed bodies built for stealth and speed, while their teeth became specialised for tearing and cutting, and they developed sharp, retractable claws for holding onto their victims.

Leopards, lions and other cats share a common ancestor that lived in Asia some 11 million years ago. Using connections such as the Isthmus of Panama and the Bering land bridge between Siberia and Alaska, diverging cat species spread all over the planet.

"Lions appeared quite late, perhaps around 750 000 years ago," says Deano. "They became the dominant cats in Africa because they were socially and physically adapted to hunting on open grasslands which became abundant on the continent at the time."

As large, slow-moving prey animals started to be replaced by more speedy ones, sabre-toothed cats, who were lions' main competitors, could no longer compete with their more agile feline

cousins and went extinct. Ten thousand years ago, lions were one of the most widespread large land mammals on the planet, inhabiting most of Africa, North and South America and Eurasia. Today they are found only in sub-Saharan Africa and as a critically endangered remnant population in the northwest of India.

A look at lions' long evolution should convince even the most ardent sceptic of our duty to conserve their habitat, along with that of the other members of the Big Five, for many generations into the future. 🐾

THE SUPER SIX?

About five million years ago, the ancestors of the Big Five shared their hunting grounds with another formidable mammal: an African bear. *Agriotherium africanum* was bigger than a polar bear and roamed across most of Africa. Much like today's bears, it probably ate meat and vegetable matter, but since it lived in a temperate climate, most likely did not hibernate.



Step back IN TIME

If you'd like to see South Africa's ancient mammals in the flesh, uhm ... bone, visit these excellent fossil sites:

At the West Coast Fossil Park, you can learn how palaeontologists hunt for extinct creatures. The tour takes you to an active dig site where teams from the University of Cape Town are still excavating *sivatheres*, an ancient type of giraffe, and you can sieve for microfossils yourself. Park manager Pippa Haarhoff says: "The better we understand our planet, the better we'll look after it."

Tours run Monday to Friday 09h00 to 15h00 and from 10h00 on weekends and public holidays. Cost: Adults R50, students and pensioners R25, children R15. Tel 022-766-1606 www.fossilpark.org.za

Many of the fossils found at the West Coast Fossil Park are now on display at the Iziko South African Museum in Cape Town. Open 10h00 to 17h00. Visitors over 16 years R15, under-16s free, pensioners and students R5. Tel 021-481-3800, www.iziko.org.za

A 400 m fossil trail in the Karoo National Park zooms in on the mammal-like reptiles that once lived in the Karoo Basin. Free for park visitors. Accessible by wheelchair. Tel 023-415-2828 www.sanparks.org/parks/karoo/

The award-winning Maropeng Visitor Centre focuses on the roots of another mammal: humankind. Learn about our ancestors who were hunting the plains at the same time as giant buffalo and sabre-toothed cats. Open 09h00 to 17h00. Cost: Adults R95, pensioners R65, children R55. Tel 014-577-9000 www.maropeng.co.za

PHOTOS: RIAAN VERMEULEN • COURTESY OF DR. DEANO STYMER / GENOZOIC PALAEOLOGY COLLECTIONS AT THE IZIKO SOUTH AFRICAN MUSEUM IN CAPE TOWN