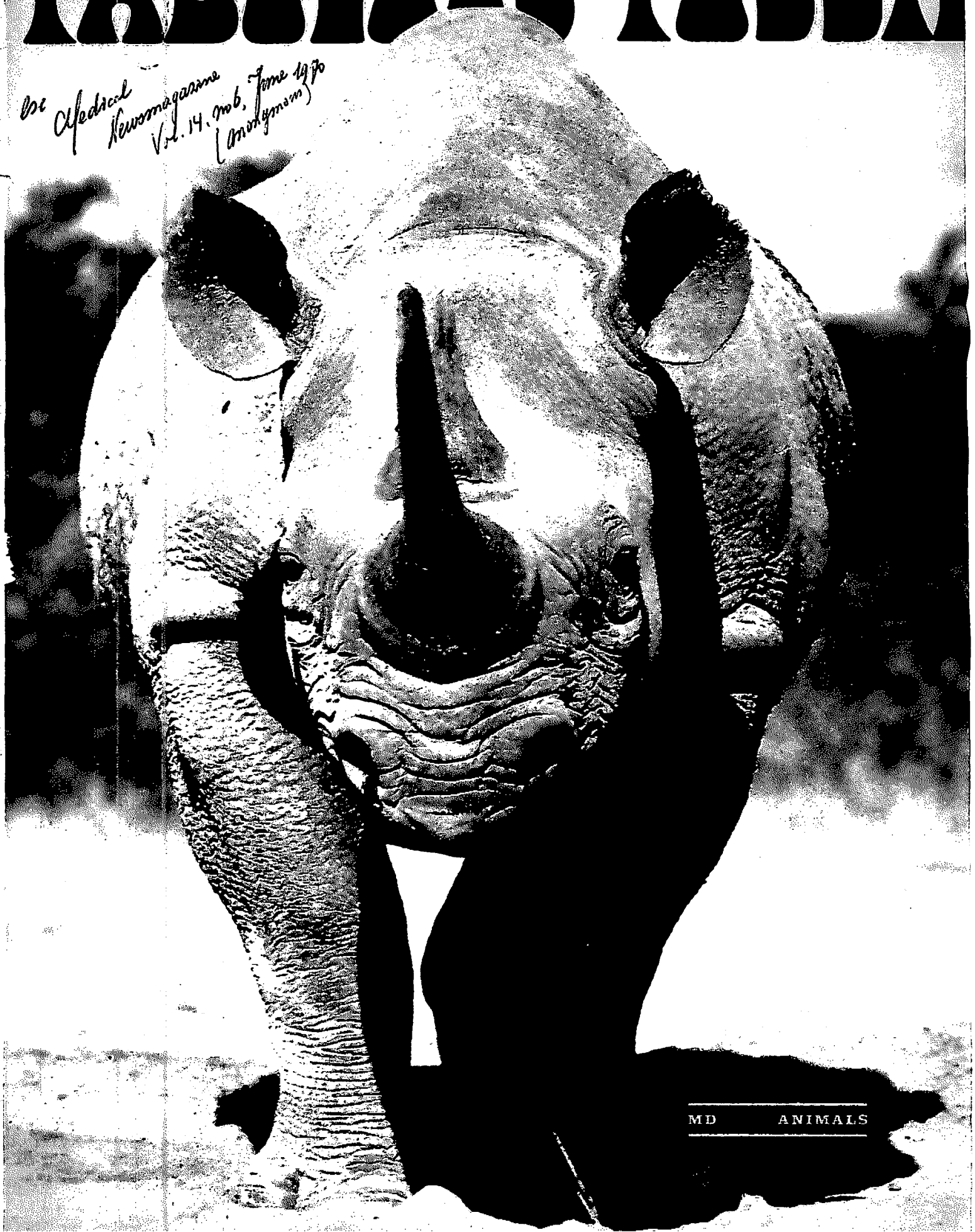


FABULOUS FOSSIL

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ANIMALS

*Third century mosaic from Sicily shows Roman hunters capturing a rhinoceros in an African swamp. Frontispiece shows a black rhinoceros, *Diceros bicornis*, which is distinguished from the white species by its pointed lip.*



Barrel-bodied, armor-plated, with a menacing horn or sometimes two, the rhinoceros has come down through history as a fabulous beast evoking visions of prehistoric worlds and mysterious powers. It was reputedly the most fearsome of animals and the hardest to kill. Every part of its body possessed medicinal properties. Its horn could detect poison in a drink, would confer immortality in a potion and was worth its weight in gold as an aphrodisiac.

Unlike dragons and other mythical monsters, the rhinoceros is mortal flesh, its armor only skin and its ferocity an illusion. Legend and fact coincide in only one particular: it is one of the oldest of mammals, a living fossil. But it may yet die of its reputation, hunted to extinction for its supposed magic powers after some 60 million years of life on earth.

DISCOVERY. Man's first recorded acquaintance with the rhinoceros was in the Ice Age when paleolithic hunters painted on their cave walls a horned beast second only to the mammoth in size and ferocious aspect. The woolly rhinoceros of their portraits was 6 ft. high and 12 ft. long, with a coat of long coarse hair, a golden-brown woolly undercoat and a mane of thicker hair over the shoulders; it was two-horned, and its anterior horn might measure up to 3.5 ft.

This impressive animal vanished with the ice around 20,000 years ago and Europe lost its last indigenous rhinoceros. The next to appear were exotic imports, part of the Roman circus of Asian and African beasts brought in to entertain the populace, caged for display in triumphal celebrations or pitted in the arena against other beasts or men. Goaded to fear and rage, the ordinarily solitary and timid ani-

mal tossed bulls and bears on its horn and frightened off lions. Roman writers called it the fiercest animal on earth, an invincible fighter with a horn that could pierce brass and solid rock.

The rhinoceros vanished from Europe for the second time after the fall of Rome. Indian princes kept tame rhinoceroses as a symbol of their power, fixed iron tridents to their horns and used them in battle; Indian warriors carried shields made of rhinoceros hide, which is easily pierced in life but extremely tough when dried. One tale tells of Timur on his triumphant entrance into Delhi being welcomed by the defeated ruler's 12 rhinoceroses standing in line with bowed heads.

Meanwhile in medieval Europe the fierce and ugly beast of antiquity became a marvelous creature that could destroy knights and their horses in full armor, but would gently lay its massive head in the lap of a virgin and go to sleep.

METAMORPHOSIS. The transformation of the lumbering rhinoceros into a prancing unicorn began with a 4th century BC Greek physician named Ctesias at the court of a Persian queen. Ctesias wrote some 23 books of assorted information, among them one on India in which he described an "Indian ass" with a horse's mane and a single frontal horn which, if made into a drinking cup, would detect poison. He had apparently never seen a rhinoceros, but the special properties of its horn were even then an Oriental belief: Eastern potentates treasured their rhinoceros horn wine cups, which protected them from poison, illness and, some said, even natural death.

The marvels of Ctesias' animal survived through the centuries but its name changed. Scholars found in the Septuagint translation of the Old Testament a

horned animal called *monokeros* in Greek, which became *unicornis* in the Latin of the Vulgate, both meaning single-horned.

Medieval bestiaries written in Latin popularized the name unicorn. They also improved on the myth, recounting that the unicorn preceded other animals to the watering holes and first dipped its horn into the water to make certain it was drinkable. Christian allegory adopted the unicorn, an unconquerable creature, as a symbol of invincible purity; the legend grew that only a pure maiden could subdue it and it came to represent chastity, the angel of the Annunciation, sometimes the Holy Ghost.

Marco Polo, writing in 1298 of the Great Khan's remote kingdom of Lesser Java, described "unicorns" with the hair of the buffalo, feet like the elephant's and one black and very thick horn in the middle of the forehead*. He wrote: "These unicorns like to spend their time wallowing in the mud. It is a very ugly beast to look at and is not at all like the one our stories say is caught in the lap of a virgin."

His factual account had no dampening effect on the legend, and when a spectacular kind of animal horn, long, slender and spirally twisted, began to appear in Europe it was at once accepted as the horn of the fabulous beast and possessed of all its miraculous properties. This decorative horn of the unicorn pictures, sometimes nine feet long or longer, was actually the tusk of the narwhal, an arctic cetacean. Queen Elizabeth I owned one, called the Horn of Windsor, which according to the geographer Richard Hakluyt was found on an island in Frobisher's Strait. Another one was mentioned by Benvenuto Cellini as a gift from the Medici Pope Clement VII to Francis I on the marriage of the French king's son to the pope's niece Catherine de Medici.

Ground unicorn's horn (alicorn) became a medical remedy of high repute and a panacea for all ills. It might be narwhal or fossil elephant tusk or, as trade began with the Indies, true rhinoceros horn. In 1591 the ailing Pope Gregory XIV received a gift of an Indian rhinoceros horn and his physicians administered some of its powdered tip to him on his deathbed†; alicorn was listed in an English pharmacopeia as late as 1741.

REDISCOVERY. In 1513 Europe saw its first live

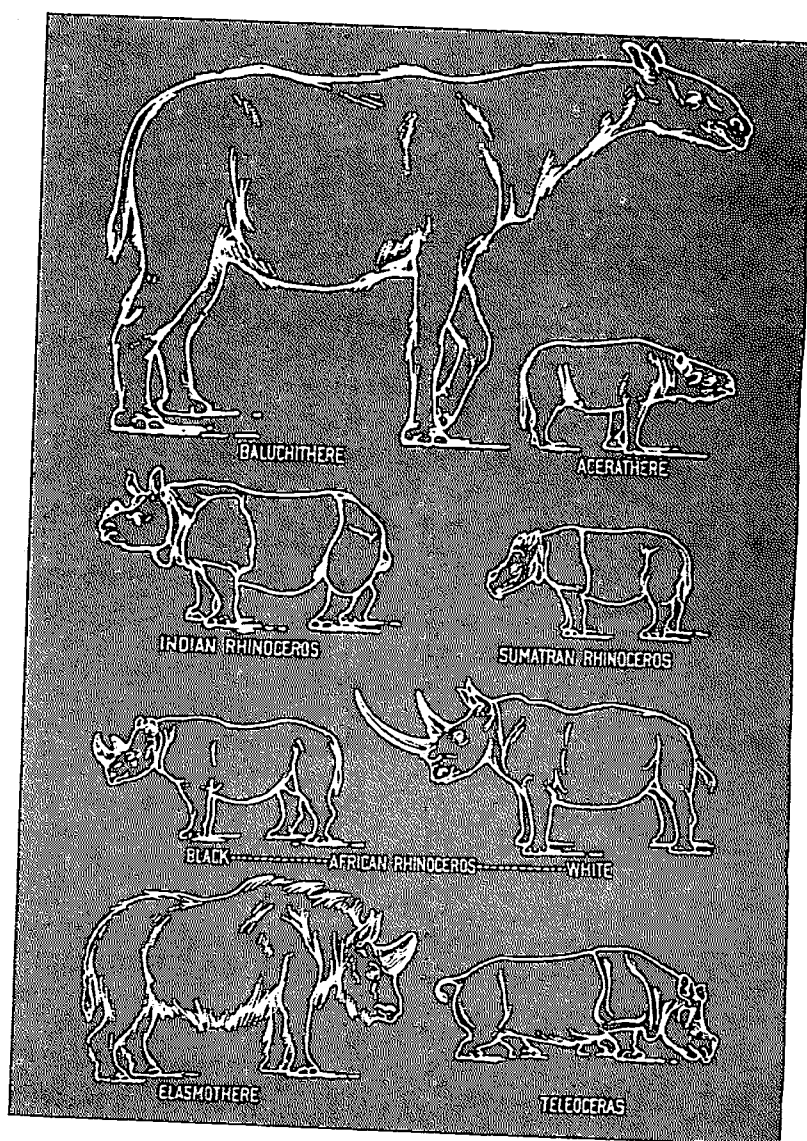
*He combined the features of the one-horned Javan and the hairy two-horned Sumatran rhinoceroses; both were found at that time in Lesser Java, now Sumatra.

†The historic horn in its leather sheath is in the collection of the American Museum of Natural History.

Drawing from the American Museum of Natural History shows living and extinct rhinoceroses. Baluchithere disappeared during the upper Miocene period; Elasmotherium occurred in Pleistocene Siberia and southern Russia; teleoceres lived in early Pliocene North America.

"unicorn" since Roman times, an Indian single-horned rhinoceros sent as a gift from the king of Cambay in western India to Manuel I of Portugal. This animal was the model for Albrecht Dürer's woodcut, used by the Zurich physician and naturalist Konrad von Gesner in his *Historia animalium* (1551-58) and in many natural history books thereafter; its portrait is also in bronze relief on the west portal of the Duomo in Pisa. The animal itself perished in a shipwreck en route to Pope Leo X (washed ashore, it was stuffed and sent anyway).

Unlike Marco Polo, European viewers failed to identify their age-old fantasy with this fascinating but ugly reality: the unicorn took on a life of its own and sightings of the legendary beast in the flesh were still being reported from the depths of South Africa or the heights of Tibet until well into the 19th century. Its romantic image continued to appear on heraldic devices (including Britain's royal coat-of-arms) and apothecary signs, and has survived into modern times as the trademark of the



British pharmaceutical manufacturer, Burroughs Wellcome.

In 1685 English crowds marveled at a second Indian rhinoceros, but most famous was the one that toured Europe in the next century. Transported on a carriage drawn by 20 horses, it created a sensation at the Leipzig Fair, was escorted into Vienna like royalty by an honor guard of cuirassiers; the French court adopted fashions *à la rhinocéros* and Louis XV tried to buy it for the Versailles menagerie. It made a fortune for the Dutch sea captain, Douvement van der Meer, who brought it to Europe and his asking price was 100,000 crowns.

The three-year-old animal had been captured in India in 1741; at eight it was 5.5 ft. high and 12 ft. long. Daily rubbing with fish oil kept its armor-like hide shiny; it consumed 60 lb. of hay, 20 lb. of bread and 14 buckets of water a day and amused crowds by drinking quantities of wine and beer.

In the same century the Swedish naturalist Carl Thunberg tested rhinoceros horn in his university of Uppsala laboratory and discredited its supposed poison-detecting powers. But in eastern Asia and Indonesia this belief and others still persist: rhinoceros blood is credited with easing the soul's departure at death and its journey to the spirit world; the urine is used as an antiseptic and a charm against disease, ghosts and evil spirits; the viscera, hide, certain bones and the contents of the stomach all have pharmaceutical value and a fetus is especially prized. The horn is rented out to expectant mothers for the equivalent of about \$75 and placed under the bed to ease the pains of childbirth. Water in which a rhinoceros horn has been soaked is still held to be an elixir of life.

But the gravest threat to the rhinoceros is the belief in the aphrodisiac properties of its horn, which reputedly persists in China today; it has been a valued item in the trade with China for at least 1500 years. In the 1890s Chinese and Arab traders were offering from 40 to 150 guilders for a rhinoceros horn in Java, and the explorer Carl Bock was offered one in Sumatra for 80 guilders. Before World War II horns were bringing \$10 per oz. in Malaya and one-half their weight in gold in Calcutta.

This trade has reduced the once plentiful Indian species to some 600 or 700 animals, the Sumatran to about 100 and the Javan to fewer than 25, and is now diminishing the two African species, which in a recent census numbered about 11,000 of the black and 2500 of the white animals. A rough total of perhaps 15,000, in five species of which two are close to extinction, are all that remain of a family that once roamed over the entire northern hemisphere and down to the southern tip of Africa in vast numbers, great variety and sometimes fantastic shapes and sizes.

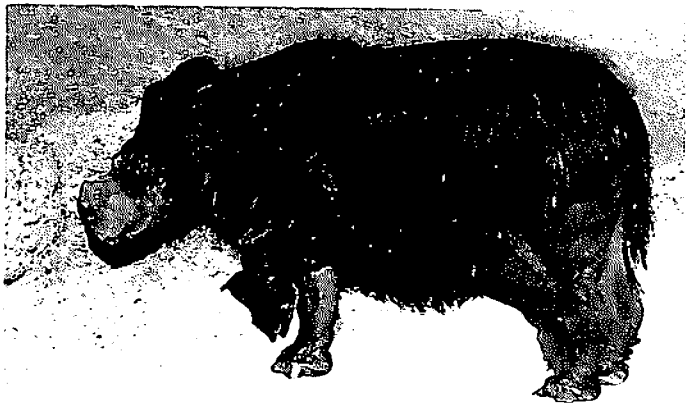
FAMILY PORTRAIT. Workmen in medieval Europe often turned up huge bones as they plowed and quarried, which were taken as certain proof that giants and dragons had inhabited the land in ancient times. A rhinoceros skull was the model for the head of a dragon on a 16th century building in Klagenfurt, Austria, and in the next century some rhinoceros bones dug up in Canterbury were identified as those of a sea monster.

In 1799 the German naturalist Johann Friedrich Blumenbach, who had already described the fossil mammoth, published a description of a frozen carcass found in Siberia some three decades earlier and named it *Rhinoceros antiquitatis*. The bones of 170 rhinoceros specimens had been collected and classified in 42 different genera when in 1898, the American paleontologist and later director of the American Museum of Natural History, Henry Fairfield Osborn, began his classic organization of rhinoceros fossils.

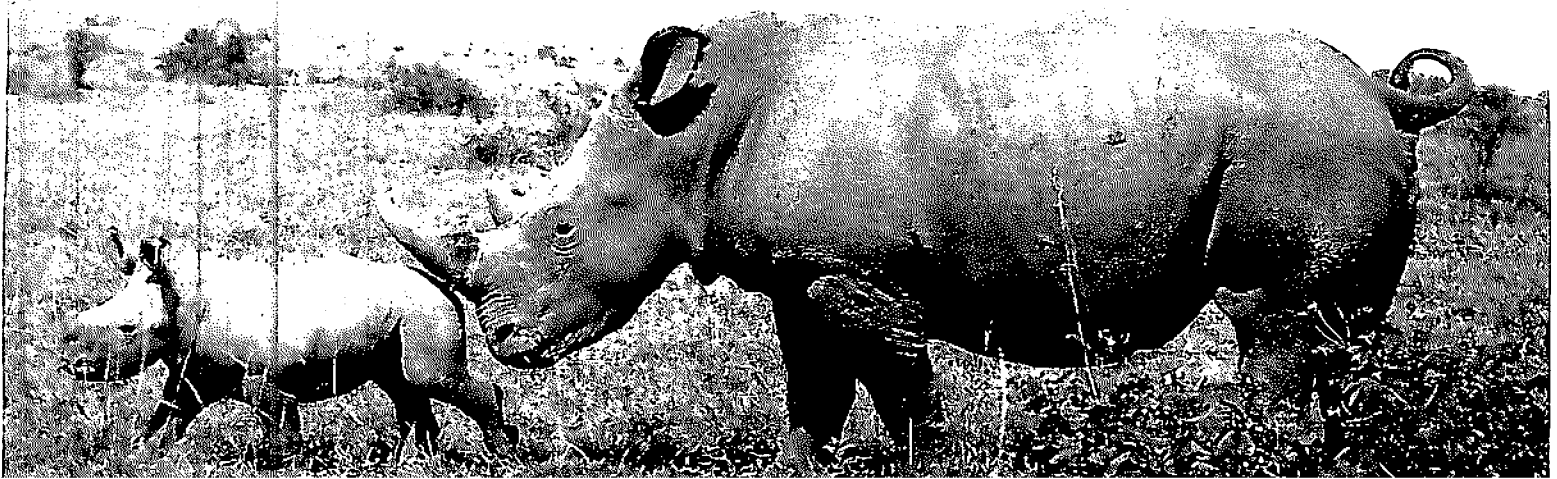
For years it was thought that the origin of the rhinoceros must be sought in Central Asia. Roy Chapman Andrews on the museum's celebrated Gobi Desert expedition found the bones and complete skull of a colossus of a rhinoceros, larger than the imperial mammoth of the Great Plains and indeed the largest mammal known ever to have lived on land. This was *baluchitherium*, which became extinct some millions of years before the Ice Age: it stood between 18 and 19 ft. high at the shoulders and 28 ft. from muzzle to tail; its head alone was 5 ft. long.

More recent finds have convinced paleozoologists that the family birthplace was North America, the time was the Eocene or dawn epoch of between 50 and 60 million years ago and the earliest known ancestor was probably *hyrachyus*, a small, slender, hornless beast about the size of a large dog, resembling and in fact related to *hyrachotherium* (also called *cohippus*), the earliest horse. Horse and rhinoceros both belong to the perissodactyl or odd-toed order of ungulates but not to the same one of its two suborders: the horse is one of the hippomorpha; the tapir and the rhinoceros are the two members of the ceratomorpha.

Discovered in 1941 was the footprint of a rhinoceros weighing about 600 lb. in the sandstone of Hat Creek Basin in Wyoming, which marked a watering hole of Oligocene animals of about 40 million years ago. A long-necked, slender-legged running rhinoceros roamed the Oligocene plains, and a short-legged and heavy-bodied one wallowed in the river beds like the hippopotamus. A Kansas rhinoceros of early Pliocene times stood only about four feet high but was 10 ft. long and had a girth of 9 ft. 2 in., a beast like a huge barrel on thick tree-stump legs. The male of this odd-looking species had a tall, thin,



*Above, the single horned Indian rhinoceros, *Rhinoceros unicornis*, which once ranged over the Ganges, upper Indus and lower Brahmaputra valleys. At right, from top, an orphan being fed milk by a South African gamekeeper; the Sumatran rhinoceros, *Dicerorhinus sumatrensis*, smallest and most primitive species, a descendant of the woolly rhinoceros; the Javan, *R. sondaicus*, is seen in the only known photograph of the species. Below, the square lipped white rhinoceros, *Ceratotherium simus*. Unlike other animal mothers, the rhinoceros drives calf ahead.*



wedge-shaped nasal horn; the female's horn was much smaller.

The trend toward hugeness began early; the other marked characteristic, the nasal horn, was a later development and far from uniform. The colossal baluchitherid had no horn at all; another giant, the long-necked slender elasmotherid of Pleistocene Europe and Asia, had a large horn on its forehead instead of on its nose. One of the first horned species, the diceratherid of Oligocene times in North America, had a pair of horns side by side instead of in tandem. The woolly rhinoceros had two horns in tandem; of the modern species, the two African and the Sumatran follow this pattern and the Indian and Javan have single horns.

SURVIVORS. All five modern rhinoceroses descend directly from late Miocene ancestors but they spring from at least three and more likely four different lines. Rhinoceros history is among the most complex in the animal world, so tangled with branches and offshoots that it has been likened to a bush rather than a family tree. The *Rhinoceros unicornis* of India and the nearly extinct *R. sondaicus* of Java, the lesser one-horned species, belong to one genus. The black and the white African rhinoceroses are classed in the same genus by some authorities but most experts regard them as separate genera, *Diceros bicornis* and *Ceratotherium simus*. The hairy, two-horned Sumatran *Dicerorhinus sumatrensis*, smallest and most primitive of the living family, is believed to be the only surviving descendant of the woolly rhinoceros; a local variant is the hairy-eared rhinoceros of Chittagong, *D. sumatrensis lasiotis*, somewhat larger and with more and redder hair.

Largest of the family and the most highly evolved, with the specialized square muzzle of the grazing animal, is the white rhinoceros of Africa: 6 ft. and more in height, 14 ft. long, it is the world's third largest land mammal (after the Indian and African elephants)*; one record pair of horns measured 62.5 and 22.5 in. The head alone is some 4 ft. long and strikingly broad and heavy, supported by huge neck muscles that form a hump in front of the shoulders; the animal carries its great head low and rests with its chin on the ground. The white rhinoceros is no whiter than its black cousin is black (both are shades of gray); its name may derive from the Afrikaans *wijt*, meaning wide. Both are believed to stem from a Eurasian parent line of forest dwellers which migrated across a land bridge to Africa during the period of rising land masses, between Miocene and Pliocene times. The black remained a browser; about a third smaller than the white, it feeds on thornbush and such prickly vegetation with the aid of a prehensile pointed lip.

*One-ton hippopotamus is smaller than most rhinoceroses.

The rhinoceros of myth and the original of the unicorn is the Great Indian species: with its thick single horn, its great girth and the deeply folded hide marked by tubercles, like riveted armor plates, it is the paradigm of rhinoceroses. It may rival the white rhinoceros in size with a height up to 6 ft., up to 14 ft. of length and a weight of 2.5 to 4 tons. It once ranged throughout northern India and is pictured in the ruins of Mohenjo Daro, the Indus city of about 2000 BC; today its 600 or so survivors are found only in the flood plains of Assam and on the Nepal heights, living in jungle swamps and river bottoms and hiding in tall, dense elephant grass.

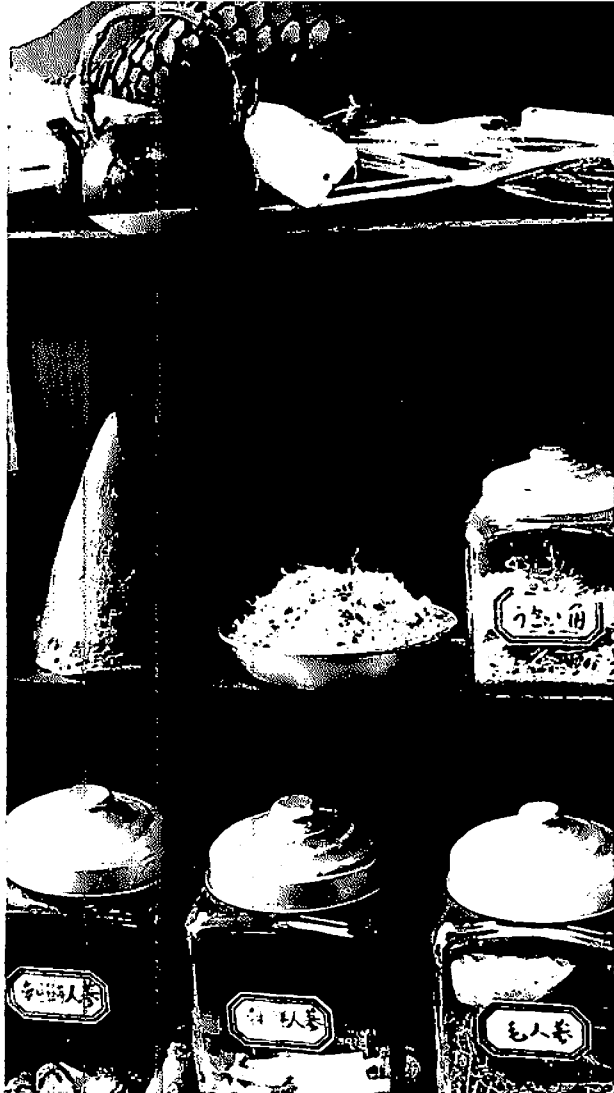
All the species share to some extent the thick, deeply folded hide. It is far from impenetrable, offering little resistance to scratches and bleeding from a thorn prick. All have the family features of a heavy body, short legs and oddly designed countenance with the ears placed far back, the small eyes lying far forward and the horn springing up from the nose; all have a three-toed hoof, with the axis of the foot passing through the middle toe.

Rhinoceros horn is not horn or ivory but modified hair; in the African species the heavy anterior horn is supported by an ossified septum and the posterior horn is more frontal than nasal. The Asian species use the enlarged, tusklike incisors of the lower jaw for defense; the African animals, having lost their incisors, use their horns.

The family has excellent senses of smell and hearing but poor vision; a rather dim intelligence and a childlike inquisitiveness combine to make them vulnerable to slaughter. Their sharp-eyed bird companions, the cattle egrets, feed on the insects they flush and the ticks on their hide and warn the big beasts of danger by taking flight. Despite its size and ungainly shape the rhinoceros trots at a fast pace and can gallop up to 35 mph for short distances. All are fond of wallowing in mud to cool their sensitive skins and remove insects.

Contrary to myth the rhinoceros is timid in the wild and gentle in captivity: zoo keepers find that even the reputedly irritable black rhinoceros eats out of their hands, offers its ears to be rubbed and some have been known to roll over to have their bellies scratched. Cleveland zoo's black male periodically has its anterior horn trimmed to prevent its interfering with the second horn: this is done without restraint or tranquilizer, one keeper feeding the animal tidbits while a second wields the hacksaw. Celebrated in memoirs of British rule in India was a laundryman in Gowhatti whose pet rhinoceros carried the washing around town.

The rhinoceros is a solitary rather than a herd animal: the white may graze in temporary groups of five or six and the black is also less hermit-like than the Indian, which may share a mud wallow or



Shredded and whole rhinoceros horn in many parts of the world continues to enjoy high medical repute for curing chest complaints, healing wounds and relieving pain.

the use of a huge common dung heap but generally lives alone. The Indian bull seeks out a female only once in every three years or so, usually in the spring, uttering the high sweet whistle of his mating call which is entirely unlike his ordinary grunt or low bellow. He may journey across the breadth of his 20 to 50 acre territory in vain, finding the cow not in season (estrus is every 36 to 58 days) or she may give him a fierce and bloody battle before she accepts mating. The black rhinoceros suitor meets a similarly inhospitable reception: the female charges, gores and batters him before she accepts his advances and beats him off again after mating.

Gestation varies from 474 to 488 days and usually only a single calf is born; the newborn weighs about 150 lb., stands 24 in. high and has no horn. It drinks some 44 pints of milk a day, eats leaves and hay in its second month, gains more than 100 lb. a month: one calf on its first birthday weighed 1367 lb. Unlike other animal mothers the rhinoceros does not usually leave her calf to follow her but drives it ahead, nudging its rump with her front horn.

PROSPECTS. The rhinoceros is hardy and subject only to common mammalian afflictions, but hunting and the shrinking of its habitats brought the Asian species to the brink of extinction early in this century and the African species, especially the white, are under grave threat today. Sanctuaries have been established on both continents and most governments have protective laws, although these are difficult to enforce. Limited hunting for sport is permitted in some African countries; hunting for medicinal purposes has been allowed in Asian countries where the sale of rhinoceros blood and other parts continues to be legal.

The principal threat is still from illegal hunting, especially for the horn which continues to have high medicinal repute in curing chest complaints, healing flesh wounds and relieving pain. Poachers in the early 1960s were reported to have killed some 500 of the dwindling Indian rhinoceroses in Nepal, taking the horn and leaving the carcasses. In Africa last fall an examination of goods shipped from Uganda to Mombasa revealed boxes containing more than 700 white rhinoceros horns which appeared to have been taken in the preceding two years.

In some African game reserves, as in Natal, overpopulation is dealt with by transporting surplus animals (taken by tranquilizing darts) to zoos or to other areas. Some conservationists suggest that stocks could be preserved in suitable climates elsewhere. Florida and Louisiana have been suggested as possible sites for such breeding refuges.

Hunting the vulnerable rhinoceros is no longer considered good sport by many sportsmen, who now prefer to shoot with cameras instead of guns. The Asian species are difficult to find: the hairy Sumatran is now thinly scattered in vastnesses of east Asia and Indonesia; the few Javan survivors keep to the most inaccessible parts of their refuge in the Ujung Kulon Reserve in western Java; the Great Indian rhinoceros hides in the jungle swamps of the Kaziranga Wild Life Sanctuary in Assam. But the African white and black species can still be seen in many reserves throughout central and southern Africa.

The odd beast has again captured men's imagination: one was the title character, although invisible, in Eugène Ionesco's satiric farce *The Rhinoceros*; a second won election to the City Council of São Paulo, Brazil, in a write-in vote. Cacareco (a female: her name means garbage) received 100,000 votes against 10,000 for the nearest candidate; her supporters' slogan, ignoring her sex, was: "Our candidate will make his weight felt."

SUMMING UP. By Ogden Nash: Farewell, farewell, you old rhinoceros, I'll stare at something less prepoceros.

