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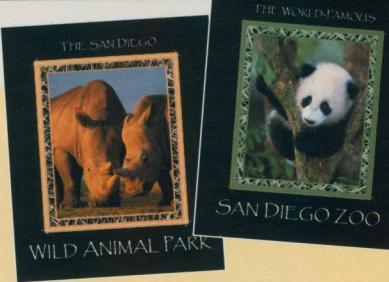
Lonnie Burstein Hewitt

COVER

The East African black rhinoceros *Diceros bicornis michaeli* is one focus of the Zoological Society of San Diego's rhino conservation research efforts. Ongoing studies in genetics, endocrinology, and reproductive physiology are being conducted at the Society's Center for Reproduction of Endangered Species (CRES), in the hope of increasing rhino populations.



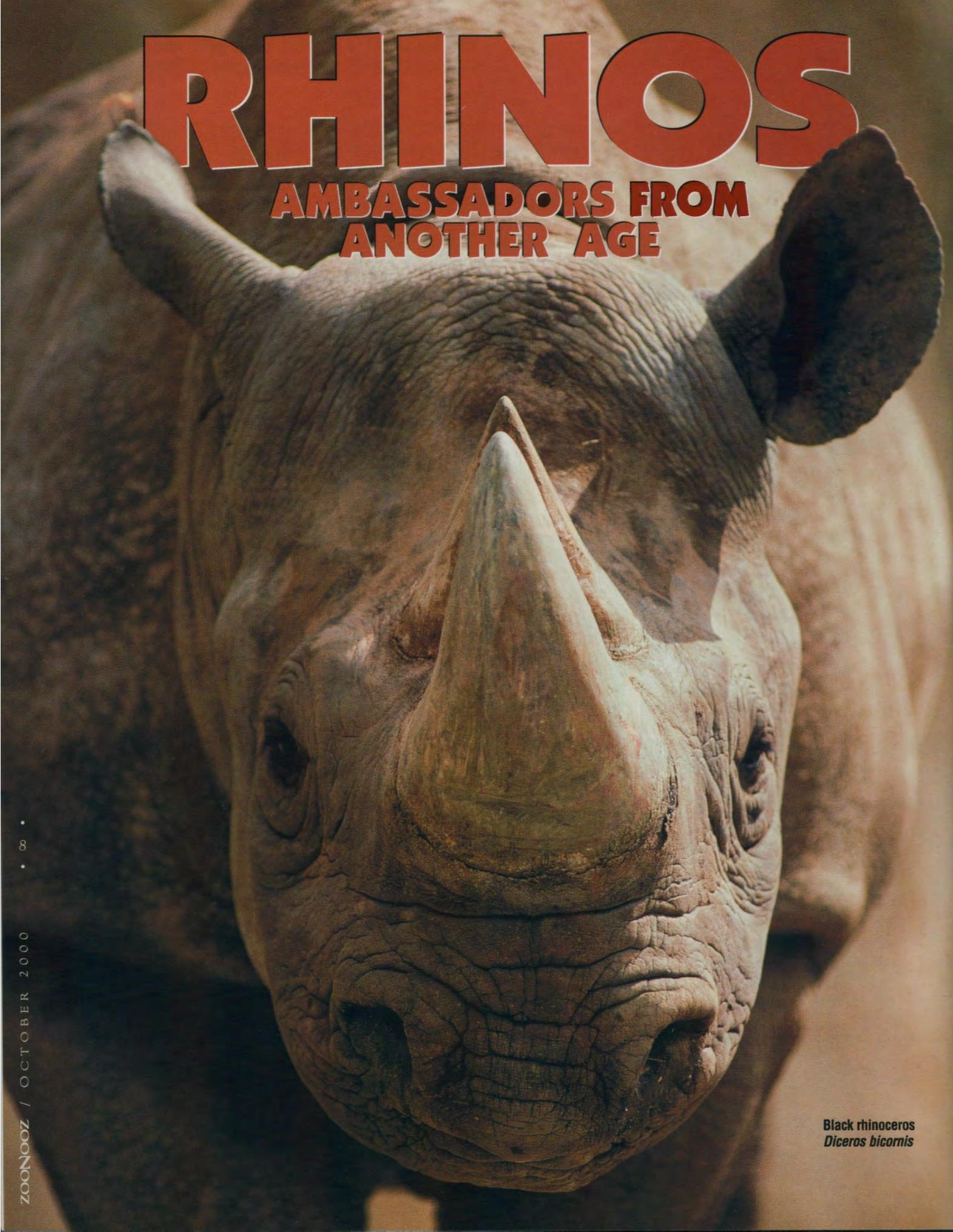
Each year the Zoological Society of San Diego observes the birthday of a principal early benefactor, Ellen Browning Scripps. Born in London, England, on October 18, 1836, Miss Scripps made her home in San Diego and provided the funds for a hospital and several major exhibits at the Zoo. Her legacy lives on today through the good deeds of the Ellen Browning Scripps Foundation, which continues to support projects at both the San Diego Zoo and the San Diego Wild Animal Park.



SAN DIEGO ZOO

RHINOS

AMBASSADORS FROM
ANOTHER AGE



Black rhinoceros
Diceros bicornis

By Michael McKeever

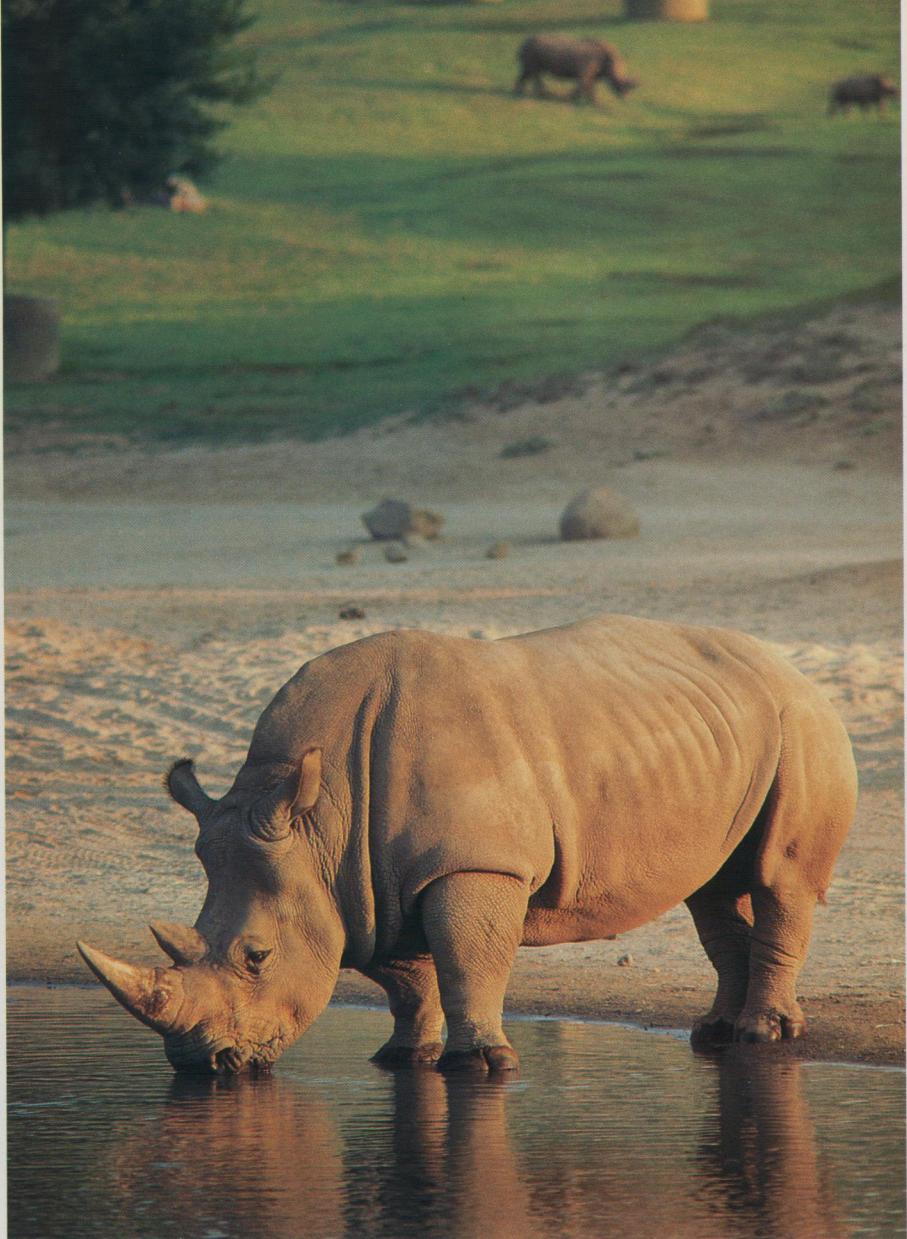
The rhinoceros looks as though it has lumbered into our time from some primeval era. Its heavyset body, with thick skin overlapping in folds that look like armor plates, stands on sturdy legs like tree trunks. Its eyes peer myopically at us from a massive head that tapers to that battering ram of a horn. In our imaginations, the lion is considered regal and the gazelle symbolizes grace and speed. But the rhino is the embodiment of brute strength, and deservedly so. One species, Africa's black rhinoceros *Diceros bicornis*, can hurl 3,000 pounds of bone and muscle at 40 miles per hour in a thundering charge. Yet, terrifying as the black rhino's onslaught can be, most of the time it is content to browse peacefully on branches and leaves. Like all rhinos, it is a vegetarian.

The rhino's lineage is an ancient one—its ancestors walked the Earth 55 million years ago. One of these ancestors, the *Paraceratherium*, was 25 feet long and 18 feet high at the shoulder, the largest land mammal ever known. Throughout the eons, close to 100 known rhinoceros species have existed. At the beginning of our present millennium, only five species continue the line, two native to Africa and three native to Asia.

Humans have long held a fascination for rhinos. In the early 1500s, King Dom Manuel I of Portugal owned a rhino that was quite a sensation. In fact, Albrecht Durer came to see it and made a splendid woodcut of it in 1515. Perhaps hoping to make a big impression, King Dom Manuel decided to send the rhino as a congratulatory gift to the new Pope in Rome, Leo X, who was elected in 1513. At least, that was the king's plan. During a first attempt, the rhino wrecked its stall and part of the ship, and on a second ill-fated attempt, the ship sank. The Pope never did get his rhino.

A group of rhinos is sometimes called a "crash," and considering the legendary aggressiveness of the rhino, some people might find this singularly appropriate. One account from a 19th-century explorer encamped in East Africa describes the events when a rhino abruptly charged. The explorer leaped into a sturdy

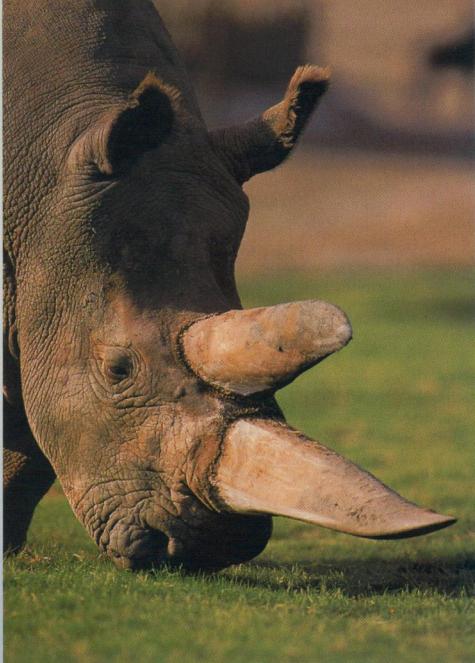
The southern white rhino can measure 6 feet at the shoulder and weigh 4,500 pounds.



ox wagon nearby. The rhino slammed into the heavy wagon and, despite the wheels being blocked by sand, pushed it several feet. Then the rhino charged the campfire, sending burning embers scattering in all directions. An African warrior on the expedition hurled his spear at the rhino. The spear simply bounced off the rhino's hide as he thundered off into the bush. When the warrior picked up his spear, he was astonished to find the metal point bent back.

The San Diego Zoo's first rhino was a black rhino, received in 1952. Breeding efforts remained unsuccessful, however, until 1996, when Werikhe, an East African black rhino, was born at the Zoo. He was named in honor of Michael Werikhe, the late Kenyan conservationist known for his extensive "rhino walks" to educate people about rhinos.





With only about 30 individuals in the wild and 9 in captivity, the northern white rhinoceros *Ceratotherium simum cottoni* is listed as critically endangered. Rock paintings and skeletal remains have shown that, at one time, white rhinos occurred as far to the northwest as Morocco and Algeria. Today, the remaining wild northern white rhinos are found only in a protected park in the Democratic Republic of Congo.

Part of the Wild Animal Park's herd of 15 southern white rhinoceroses *Ceratotherium simum simum* grazes in its field exhibit.

Zoological research since then has revealed what a complex and fascinating creature the rhinoceros is. Yet misconceptions still abound. For example, despite the warrior's bent spear, the rhino's hide, while thick, is far from being "armor-plated." In fact, it can be easily scarred. In addition, the blood vessels are close to the surface, and rhinos coat themselves with mud or dust as protection against sunburn and insect bites.

Scientists speculate that the rhino's fabled ill temper is primarily a defense mechanism. The animals have both acute hearing and an excellent sense of smell. However, their extremely poor eyesight hampers their ability to determine if someone or something is a threat. In their natural environment, rhinos have been seen charging at boulders or trees. But in zoological environments where they feel no threat, rhinos can become fairly tractable animals. There also seems to be a difference in temperament among the species. Africa's black rhino, for example, is regarded as more unpredictable and belligerent than the white rhino. Nonetheless, no matter what the species, keepers still find it prudent to be extremely cautious.

Hollywood films have conditioned many people to think of rhinos and Africa as virtually synonymous. There are rhinos in other parts of the world, but it is true that two of the species, the black and white rhinos, forage on Africa's savannas. There are two subspecies of white rhino: the southern white *Ceratotherium simum simum* and its rarer relation, the northern white *Ceratotherium simum cottoni*, and both are included in the Zoological Society's collection. There are several subspecies of black rhinos,



and the Society has two of them: the South African subspecies, *Diceros bicornis minor*, and the East African subspecies, *Diceros bicornis michaeli*.

Despite their common names, these rhinos are neither black nor white: each species is the same slate gray. The black rhino has a hooked lip, allowing it to browse easily amid low tree branches. The white rhino, on the other hand, has a wide, square mouth that allows it to graze on the savanna grasslands. How the white rhino came to be called "white" is uncertain. One account says that South Africa's early Boer settlers called it *wijde*, Dutch for "wide," which could refer to the wide lip or the size of the animal.

For centuries, the rhino existed largely unchallenged by other animals. But the advent of high-powered weapons brought a new and deadly enemy: humans. In the ensuing shooting frenzy, the rhino has been all but obliterated in the wild. The numbers alone tell the doleful story: in 1960, 100,000 black rhinos were estimated to roam the African grasslands,

The Wild Animal Park has had great success breeding southern white rhinos, with 87 births since 1972.



When the rhino charges, say the people of the savanna, the very ground shakes.



White rhinos (right) are grazers, feeding primarily on grass. Their upper lip is long and straight and creates a squared snout, which leads to their common name of square-lipped rhinos. Black rhinos (far right) and Asian rhinos, on the other hand, are browsers. They have a pointed, fingerlike lip that is prehensile and gathers leaves and twigs into the mouth, leading to their common name of hooked-lip rhinos.





Indian rhinos are often described as armor-plated, because of their heavy skin that folds into sections. But like all rhinos, an Indian rhino's skin can be scratched and scarred, and they are susceptible to sunburn and insect bites. Wallowing and wading are a pleasant form of protection.

but by 1985, the number had fallen to 7,500. By August 1999, the wild black rhino population was estimated at perhaps 2,600. In Southeast Asia, the numbers are even more frightening. One Asian species, the Javan rhino *Rhinoceros sondaicus*, numbers only about 50 individuals in the wild.

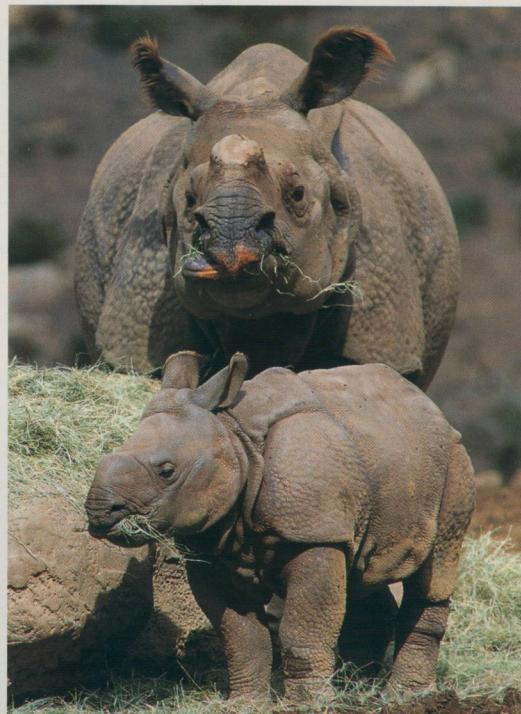
These losses are even more tragic when we realize that most of the rhinos have died as the result of human vanity. In eastern Asia, powdered rhino horn has long been considered a powerful aphrodisiac. But in fact, rhino horns are made of keratin, the same protein that makes up our fingernails, and studies

have not discovered any magical rejuvenating powers in the substance. Nonetheless, a poached rhino horn today can easily bring tens of thousands of dollars on the Asian market.

Meanwhile, in Middle Eastern countries such as Yemen, decorative dagger handles of rhino horn are highly prized. Sometimes other materials are substituted, such as buffalo horn. But a handle made of rhino horn is still more valued than any other. Because of the high demand for their horns, 90 percent of Kenya's wild rhino population was killed by poachers in the 1970s. Some rhinos also have been lost because of habitat destruction, as civilization moves into what were once wilderness areas. But the vast majority of rhinos lost in recent years have fallen prey to poachers.

The Indian rhinoceros *Rhinoceros unicornis*, or greater one-horned rhinoceros, is the largest of the three Asian/Indian rhino species. A male can weigh over 4,500 pounds and stand 6 feet at the shoulder. Unlike his distant African relations that browse on tinder-dry grasslands, the Indian rhino prefers humid swamps, with their abundance of water and lush vegetation. At one time, these rhinos were common across the Indian subcontinent and north into Nepal. King Dom Manuel's undelivered gift to the Pope was an Indian rhino.

Fortunately, Indian rhinos breed well in captivity. Their studbook is maintained at Switzerland's Basel Zoo. Other zoos, including the Wild Animal Park (where 32 Indian rhinos have been born), London, and Berlin report successful breeding. Conservation efforts have also proved fruitful in the wild. In 1966, for example, only about 400 Indian rhinos lived in India's Kaziranga National Park and Orang and Pobitera Wildlife Sanctuaries. Today, the number has increased to about 1,300. Twenty-five years ago, there were perhaps 100 Indian rhinos in Nepal's Terai region, but currently, Nepal's Royal Chitwan National Park contains 500 Indian rhinos, and it has reached its maximum capacity as a rhino habitat. Consequently, officials have begun to move some rhinos to other areas. In March 1999, financed by the World Wildlife Fund and the U.S. Fish and Wildlife Service, 9 Indian rhinos from Chitwan were moved to the Royal Bardia National Park, where there are now 52 rhinos.



The Indian rhinoceros *Rhinoceros unicornis* gets its scientific name from its most famous feature: *unicornis* means "one-horned." In addition, the word *rhinoceros* means "horned nose," which also aptly applies to the other rhino species.

The picture is even bleaker for the smaller Sumatran rhinoceros *Dicerorhinus sumatrensis* and Javan rhinoceros *Rhinoceros sondaicus*. With their dwindling populations camouflaged by dense Asian rain forests, an accurate census is extremely difficult. But it is clear that their numbers have diminished.

The Sumatran rhino is the smallest of the world's rhino species, with a grown male weighing less than 2,000 pounds. The only two-horned Asian rhino, it is also the only rhino covered with a coat of shaggy hair. Once found from the Himalayan foothills of Bhutan to Vietnam, it survives today in a few scattered populations in the forests of Malaysia, Sumatra, and Borneo. In August 1999, the total Sumatran rhino population was estimated to be only about 300.

The World Wildlife Fund has called the Javan rhino the world's most endangered large mammal species. It is a tragic distinction. Once this forest dweller ranged throughout Thailand and Sumatra and in parts of India and Myanmar. Today, a small population clings precariously to life on the western tip

of Java, in the Udjung Kulon National Park. Another 12 or so can be found in Vietnam's Cat Loc Nature Reserve. Combined, the total wild Javan rhino population is about 50.

Currently, there are a total of 36 rhinos in the Zoological Society of San Diego's collection. The Zoo has 3 black rhinos, and the Wild Animal Park has 15 southern white rhinos, 3 northern white rhinos, 2 black rhinos, and 13 Indian rhinos. The San Diego Zoo acquired its first rhino in 1952, a black rhinoceros calf from Kenya. Named Sally, she was an immediate hit with zoogoers. However, despite two mates, she failed to breed. But in October 1976, another female black rhino gave birth to a calf named Nanyuki at the Wild Animal Park, and since then the Park has had 9 black rhinos born.

The Wild Animal Park received its first rhinos in February 1971. Twenty southern white rhinos arrived from South Africa's Natal Parks Board and were joined by two more sent from the San Diego Zoo. Historically, southern white rhinos had not reproduced well in captivity.

In their natural environment, rhinos have been seen charging at boulders or trees.

The black rhino has a reputation for being aggressive, perhaps due to its poor eyesight, which makes the rhino wary of anything it can't immediately identify. The black rhinos at the San Diego Zoo, however, apparently feel very secure because they are affectionate with their keepers.



An Indian rhinoceros nuzzles her calf at the Wild Animal Park. Female rhinos are caring and attentive mothers, and their young often stay with them for several years, learning how to find food and water and how to protect themselves.



The Sumatran rhinoceros *Dicerorhinus sumatrensis* (above) and the Javan rhinoceros *Rhinoceros sondaicus* are in imminent danger of extinction. There are only about 300 Sumatran rhinos left in the world, and estimates put the Javan rhino population at 50 or less.

But on October 11, 1972, a male southern white rhino was born at the Wild Animal Park. Only the second southern white rhino born outside Africa, he was given the name Zibulo, a Zulu word meaning "first fruits of man." Within a decade, 42 more calves were born at the Park.

To date, 87 southern white rhinos have been born at the Wild Animal Park, each a cautious step back from the abyss of extinction. Today, the southern white rhino's likeness prances proudly across the logo patch worn by Wild Animal Park employees. There is a hint of cautious optimism as the births are recorded in the southern white rhino's studbook, maintained at Germany's Berlin Zoo (which also keeps the black rhino studbook).

Meanwhile, breeding attempts for black rhinos at the San Diego Zoo continued. In October 1996, the Zoo announced its first black rhino birth. The male calf was named Werikhe, in honor of the late Kenyan conservationist, Michael Werikhe. Affectionately known as the "Rhino Man," Werikhe traveled the world, including San Diego, on sponsored "rhino walks," garnering support for the endangered black rhino. His first "rhino walk" took place in 1982, and he raised hundreds of thousands

of dollars for rhino conservation projects until his death in 1999. "In this nuclear age," he said, "there are no national boundaries to the environment. The rhino will live or die because of us."

On dusty savannas, in shadowed rain forests, and in scientific laboratories, research in rhino conservation goes on. At the Zoological Society of San Diego's Center for Reproduction of Endangered Species (CRES), molecular geneticists use computers to find the genetic blueprint of black rhinos. In South Africa's Pilanesberg Game Reserve, white rhinos are tracked via computer microchips inserted harmlessly in their horns. At Zimbabwe's Hwange National Park, black rhino footprints, each as individual as our fingerprints, are digitally photographed. With the help of the Global Positioning System, a satellite-tracking system, computers can now follow specific rhinos.

When the rhino charges, say the people of the savanna, the very ground shakes. With each passing year, there are fewer wild rhinos to create thunder on the plains. But with each new bit of information, the struggle continues to keep these mighty ambassadors of an earlier time from vanishing from the Earth. 

On the brink? A female northern white rhinoceros surveys her territory at the Wild Animal Park.



Native to eastern and southern Africa, the black rhinoceros *Diceros bicornis* can be distinguished by a slightly protruding upper lip with a prehensile tip. In addition to a large front horn and a smaller second one, there is sometimes evidence of a much smaller third horn. This past summer, a rare southern subspecies of black rhino *Diceros bicornis minor* was born at the Zoo for the first time.