

They're Killing Off

SOMETIME in the late 1970s half the white rhinoceros population of Uganda suddenly disappeared—a single rhino, probably shot by a gang of poachers. At the time, nobody realized that it was one of only two left in the country.

For almost eight years Uganda had been in chaos. Idi Amin was struggling to stay in power, tens of thousands of citizens had been murdered at his command, and the ordinary people of Uganda were frightened and hungry. To shoot any animal for food or

needed cash was perhaps understandable.

Today, as one would expect five years after the overthrow of Amin's regime, Uganda's wildlife is in less critical condition. But even with reduced poaching, there is no hope for white rhinos here with only one left, and now even the black rhinoceros, smaller cousin of the white, may be on the final lap toward extinction in Uganda.

Always more numerous than the whites, black rhinos were also thought to be considerably less vulnerable to poaching



the Rhino

By ESMOND BRADLEY MARTIN

Photographs by
JIM BRANDENBURG

because of their greater wariness and their tendency to keep to thick bush. Nevertheless, according to Iain Douglas-Hamilton, who was employed as an adviser to Ugandan antipoaching operations in the early 1980s, there *may* still be six or so black rhinos in Uganda. No more than that.

"Because of the war of liberation in Uganda," Iain told me, "thousands of cheap automatic weapons became available. Almost anyone who wanted one could get one—and they're ideal for anyone who wants to poach.

Symbol of extinction, this black rhinoceros died just inside Tanzania's Lake Manyara National Park, brought down by a Masai spear in its liver. The poacher fled without the coveted horn. Heavily depleted by white hunters in the 1800s, African rhinos in the past 15 years have decreased by 75 percent as prices for rhino horn skyrocketed and agriculture transformed their habitat.

405

BARON HUGO VAN LARWICK



Under the circumstances, poaching is now quite a profitable livelihood for unscrupulous people.

"These guys mean business," he continued. "And since they are often better armed than the rangers who guard the parks and reserves, they've had a free rein. Usually they're going after elephants for the ivory, but if they find a rhino they'll shoot it as well. They only want the horn—they leave the rest to rot."

Iain is an internationally acclaimed elephant expert, and largely because of his work many people know about the decline of those animals in Africa.* But the fate of the rhino has received far less attention. Even many conservationists are unaware that while there may be more than a million elephants on the African Continent today, the number of African rhinos has plummeted to fewer than 20,000 and continues to dwindle.

THE UGANDAN EXPERIENCE is not unique. In Chad, Ethiopia, Somalia, Zaire, and Angola, raging civil wars over the past decade have also taken a heavy toll in rhino lives.

Even in relatively stable, conservation-conscious Kenya, where I live, the number of rhinos has dropped from 18,000 in 1969 to about 1,100 now. Similarly, in northern Tanzania poachers have wiped out 90 percent of the rhinos in the past ten years.

Rarer still are the three species of Asian rhinos—all quite distinct from the African types. The population of Indian, or greater one-horned, rhinoceroses left in India and Nepal has shrunk to about 1,700. The Sumatran rhino (also called the hairy rhino) today numbers only about 500, widely dispersed in the forests of Burma, Indonesia, Thailand, Malaysia, and, possibly, Kampuchea, Laos, and Vietnam. And with fewer than 70 animals the Javan rhino, restricted to the western tip of the island from which it takes its name, is considered one of the world's rarest beasts.

Years ago, when I first saw rhinos in the wild, I developed an immediate admiration for them. Second in size among land animals only to elephants, they are endlessly

*Oria and Iain Douglas-Hamilton reported on Africa's elephants in the November 1980 *GEOGRAPHIC*.



Poachers' grisly handiwork, the carcass of a rhino felled by a rifle festers in South Luangwa National Park in Zambia, one of the last refuges of a large population of the endangered black rhino. Its killers sawed off the horns to earn about \$350 from smugglers, who attempt to satisfy international demand. A solitary creature, the black rhino leaves three-toed prints on regular routes, making it easy to track. Even with a crack antipoaching team and mandatory jail terms for those caught, Zambia finds it difficult to halt the carnage in a park three times the size of Rhode Island.



NED ST. JOHN



Over-the-counter cure-all, rhino horn is popular in a Zulu muti, or medicine, shop in Johannesburg, South Africa. The six-pound horn could bring as much as \$1,400 wholesale; shavings will sell for \$30 an ounce. Rhino-horn trade is illegal in South Africa, but some shops continue to sell their old stocks.

Natal Province, home of most South African rhinos, has dealt strictly with poachers and smugglers, including officials caught in the trade. As a result, the number of white rhinos here has recovered from dangerously low levels.

fascinating because of the great variation of behavior among the different species.

With camera in hand I stalked white rhinos in Murchison Falls National Park in Uganda—before the troubles there—and was amazed at how unaggressive they were. I could pull my Land-Rover within several feet of them, and on foot get nearly as close. I remember creeping up downwind of a male that must have weighed more than 5,000 pounds to take a series of photographs showing the square lips that are so well adapted to plucking a few blades of grass at a time (in fact, grass is the chief food of these enormous beasts).

When he finally realized I was nearby, I was lying prone in front of him, completely vulnerable. But he simply ambled a little farther away. This docile nature of the white rhino is what makes it such easy prey for poachers.

CONVERSELY, I have been charged by aggressive black rhinos—which have also been known to charge at trains passing through their territory. A black's bulky yet compact form (sustained by massive amounts of shrubs, herbs, and fruits, but hardly any grass) is no hindrance to speed. The animal can sprint at 35 miles an hour, and its extraordinary muscle structure gives it the ability to turn and change directions incredibly fast.

When one of these creatures comes galloping toward you at top speed, its head swaying back and forth menacingly, making a thunderous noise each time its feet hit the ground and snorting loudly, your only thought is how to escape. Usually that means climbing a tree, but many of us are around to tell about charges simply because a black rhino became distracted from the attack by something else at the last moment, or because it had intended only an intimidating mock charge in the first place.

But one can never assume with a black rhino. In the early days of Kenya's parks, visitors were warned, "Find your rhino before it finds you!" Totally unpredictable, these animals have been reported to enter campsites at night, scatter smoldering logs of a fire, then peacefully walk away.

They are inclined to curiosity, which leads some people to believe that what sometimes may appear to be a charge is actually only an attempt to investigate. Rhinos don't have very good eyesight for distance, and I think this is what causes them to behave erratically when disturbed.

It is not always easy to find a black rhino before it finds you, however. The animal is elusive in heavy bush, and the oxpeckers that accompany it serve it as an effective early-warning system. Yellow- or red-billed birds about the size of starlings, they pry ticks, flies, and other insects from the rhino's hide. They also sound a shrill alarm when an intruder approaches—which doubtless has saved more than a few rhinos from the arrows or bullets of poachers. The poachers, however, obviously have not missed all their opportunities.

APPALLED by the ever increasing number of rhino carcasses being found, many of them with gaping holes where their horns had been removed, I set out to learn what the market for rhino products was, why the market apparently had grown larger, and what kind of prices were being paid for rhino parts. That investigation took me throughout Africa, into the

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***Dilemma of the horns:** Employees of the Natal Parks Board near Durban ponder what to do with a fortune in confiscated rhino horns, each worth thousands of dollars to Asian dealers, some of whom stockpile the commodity against future price increases. South Africa's provincial governments formerly sold the horn to raise money for wildlife conservation but now abide by international agreements banning the trade. The distinctive spike on the rhino's head is composed not of bone but of matted hair and other fibrous keratin.*





"**Rub on the eyebrows** to attract women," says Petros Rabakela (left), who recommends a rhino elixir in Johannesburg. The author, in tracking the worldwide trade in rhino horn, discovered that such traditional Zulu medicine represents an infinitesimal percentage of the market.

In Sanaa, North Yemen, where royalty once sported daggers with rare rhino-horn handles, young men cash-rich with Saudi oil-field earnings purchase the status symbols new for \$400 to \$1,000 each (lower left). This outlet, the author reckons, today accounts for half of world demand. North Yemen outlawed horn imports in 1982, but dealers last summer were still



buying horn from agents in Khartoum, Sudan, for \$700 a kilo, selling to Sanaa carvers for \$850, and then buying back the shavings to resell to pharmaceutical companies in the Far East, the major market.

In China, where for a thousand years medical literature has prescribed horn for fever, companies box pills and prepare strips of hide for treating skin afflictions (above). The bottled tonic comes from Malaysia. Only in India did the author see a powder reputed to be an aphrodisiac.



NATIONAL GEOGRAPHIC PHOTOGRAPHER STEVE RAYMER

Mideast, and later—in cooperation with the World Wildlife Fund, the International Union for Conservation of Nature and Natural Resources, and the African Wildlife Foundation—to India, Southeast Asia, Korea, Taiwan, and Japan. I got my answers, and a couple of surprises.

In Africa the only place where there is real demand for rhino products turned out to be South Africa, especially in the *muti* shops of Johannesburg and Pretoria. *Muti* is the Zulu word for medicine, and in these shops an array of herbal and animal products—including rhino—is sold.

Dr. K. M. Naidoo, a retired practitioner of homeopathic medicine and the proprietor of one of the largest *muti* shops in Johannesburg, told me that Zulus would buy a little powdered rhino horn to mix with dried lice, which they swallowed to treat jaundice.

"But I actually sell more rhino hide than rhino horn," he said.

"Whatever for?" I asked.

"Zulus have a multitude of uses for it," he replied, "both medicinal and, well, kind of magical. For instance, they'll sometimes burn a piece of it inside their homes, believing that its vapors will chase away evil spirits. They also eat a bit of rhino hide to stop a nosebleed or prevent ill effects from snakebite. I can sell a piece just an inch square for five dollars. . . . If you're really interested in the sale of hide, though, you ought to go to Natal."

I TOOK HIS ADVICE. Most of the available rhino hide comes from ranches there, where surplus old male white rhinos from the parks are stocked for sportsmen from abroad to shoot. Most of the trophy seekers don't want the hide.

The manager of one of the game ranches in Natal told me he used to sell a lot of rhino hide before the government banned its export.

Export? "I thought it wasn't sent out of the country—that it was used by Zulus instead," I said.

"Just a small fraction," he responded. "Wholesale, I could get a lot more by selling it to a Chinese merchant who sent it to Hong Kong. He used to pay me \$30 a kilogram [2.2 pounds], and since the average white male rhino yields about 120 kilos,

that meant one hide was worth \$3,600!"

That was all very interesting, but it didn't explain why rhinos had been slaughtered elsewhere in Africa in the 1970s—little or no hide had been taken from them.

WHY WERE PEOPLE somewhere suddenly wanting a lot of rhino horn? The middlemen who encouraged hunters to supply the horn on a scale hitherto unknown would not disclose any information, but it was widely rumored that plane loads of rhino horn were leaving international airports clandestinely and that dhows, the old wooden sailing ships that have plied the Indian Ocean for centuries, were also carrying the horn, stashed under their legitimate cargoes.

It was said that the Chinese used rhino horn as an aphrodisiac, and that they had been buying it since ancient times. I had no firsthand information to confirm that supposition, and, frankly, it seemed rather fanciful that a demand for love potions could escalate so greatly.

Nevertheless, I was willing to accept the idea that it could well be a traditional use for rhino horn that had recently been spurred.

"Look for some traditionally oriented people who have suddenly become rich," I told myself.

So I went through the rhino-horn statistics from the days when such trade had been legal. I was searching for a place on the Indian Ocean that used to buy rhino horn in some quantity and that had found new wealth, perhaps from the discovery of oil.

The old export records showed that Aden once bought rhino horn. That was no help! Whatever prosperity Aden once enjoyed has gone by the wayside. I began to feel that I must be on the wrong track. Then I thought of a country that had been closely associated with Aden—North Yemen. It doesn't have oil, but Saudi Arabia right next door does, and North Yemen in the 1970s had just opened up to the outside world.

A few weeks later I flew to Sanaa, the capital of North Yemen. Just how I was going to find out whether rhino horn was in demand here, I didn't quite know. However, I thought a good place to look for it would be in the *suq*, one of the most colorful marketplaces in all Arabia.

Retreat of the Rhino

Surviving for eons, the mammal family *Rhinocerotidae* originated in Europe 60 million years ago and spread to most continents; more than 30 species are found in the fossil record. With human pressure their ranges have shrunk, and the number of species has fallen to five. The white rhino is second only to the elephant as the world's largest land mammal.



SAUDI ARABIA
NORTH YEMEN



3,500 3,100

1970 1983

White Rhino

Ceratotherium simum. Also called the square-lipped rhino, this 4,500-pound animal, 6 feet at the shoulder, survives in two subspecies. The northern has been nearly annihilated in Uganda and Sudan; the southern subspecies in South Africa.



Black Rhino

Diceros bicornis. The survivors of recent poaching are scattered in and near parks of East Africa. Even at 3,000 pounds and 5-foot shoulder heights, they are hard to see since they rest in the shade in daytime.

13,500

1970 1983

I was looking for the quarter where jewelry is sold when I found myself amid an array of stalls in which craftsmen were busily making different parts of daggers.

More than 80 percent of Yemeni men wear daggers, called *jambiyya*, and they are loath to part with them for any reason.

In the suq dagger making was a major activity. There were scores of people sharpening blades, sewing belts, and carving handles. I noticed among the carvers one who was carefully collecting the shavings from the floor of his stall.

"What are you going to do with them?" I asked.

"There's someone who has offered me a good sum for them," came the reply.

I picked up some of the shavings and was sifting them between my hands

when the carver opened a big box.

"You see," he said, "they're special—not like ordinary dagger handles, which are made of water-buffalo or cow horn."

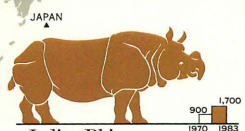
Curious, I peered over his shoulder into the box and saw a dozen rhino horns!

"This is what we use for making the best *jambiyya* handles," he explained.

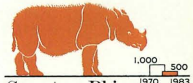
I must have stood there gaping for several seconds—my hunch had been right!

NORTH YEMEN used to be one of the poorest countries in the world.

An eight-year civil war that ended only in 1970 succeeded in overthrowing the autocratic imams who had wielded the sole political power in the country. Prior to that time few Yemenis traveled abroad, but afterward many began seeking jobs in Saudi Arabia, where they helped on construction



Indian Rhino
Rhinoceros unicornis. The 4,000-pound, 5.5-foot one-horned rhino takes readily to water, even swimming wide rivers. Strict protection in India and Nepal has swelled its numbers, making translocation possible.

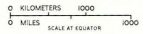


Sumatran Rhino
Dicerorhinus sumatrensis. This smallest of rhinos, at 2,000 pounds and 4.5 feet, is covered with bristly hair. Only a handful survive in rain forests, where they browse on small trees.



Javan Rhino
Rhinoceros sondaicus. Overhunting has almost extinguished this 3,500-pound, 5-foot-tall behemoth, found only in Java's Ujung Kulon Nature Reserve, set aside in 1921 for its protection.

Range of rhinos in historical times
 Major market for rhino products



RHINO POPULATION ESTIMATES AND LOCATIONS FROM ESMOND BRADLEY MARTIN, DAVID WESTERN, IUCN/SSWF AFRICAN RHINO SURVEY; ANDREW LAURIE, CAMBRIDGE UNIVERSITY; AND THOMAS FODDE, AMERICAN ASSOCIATION OF ZOOLOGICAL PARKS AND AQUARIUMS
 DRAWN BY ROBERT CROGAN
 COMPILED BY WILLIAM L. BEEBETT
 NATIONAL GEOGRAPHIC CARTOGRAPHIC DIVISION

projects and earned very high salaries. Their money flowed back into North Yemen at the rate of about three million dollars a day in 1978. As a result, Yemeni men could then afford daggers with rhino-horn handles; formerly such adornment was the prerogative of a very small elite.

It was mostly the Yemeni demand for rhino horn that caused the wholesale price to go up from \$35 a kilogram in 1974 to \$500 in 1979. This 15-fold increase in the value of rhino horn in just six years led illegal hunters in Africa from the Sudan all the way south to Namibia to go after rhinos. An average of eight tons of rhino horn a year was sold between 1972 and 1979—at a cost, overall, of some 22,000 rhinos' lives.

Even though the North Yemenis were buying more rhino horn than any other people in the world, I discovered that their

market accounted for less than half the total. That's when I decided I must go to eastern Asia. Not only could the journey help me determine if, in fact, rhino horn was used as an aphrodisiac, but it also could lead me to an explanation of what had happened to the Asian rhino populations.

IN THE TRADITIONAL medicine shops in Singapore, my first stop, I began to doubt the stories of rhino horn as an aphrodisiac. I saw a lot of other animal products being sold as sexual stimulants—dried lizards, monkey brains, sparrow tongues, deer tails, rabbit hair, and tiger penises—but no rhino horn. For other purposes, yes, as I would notice again in larger pharmacies in Hong Kong, Macao, Taiwan, Thailand, Japan, South Korea, Indonesia, Malaysia, the Philippines, Brunei,

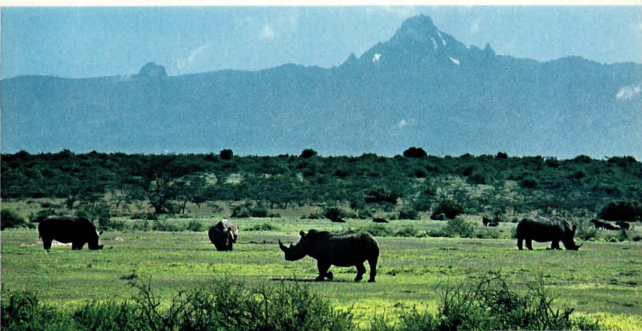


Ever alert for poachers, an armed guard watches over white rhinos transferred to Kenya's Meru National Park from Natal, where the species has increased beyond the capacity of its parks. Since the 1960s Natal has exported 3,000 rhinos to other preserves in South Africa and beyond.

Another recipient, the private Solio Wildlife Sanctuary southwest of Mount Kenya, guards breeding populations of both black and white rhinos (right) behind steel fences in the heart of an immense cattle spread. Black rhinos living unfenced on nearby ranches have been hit by poachers in recent months. Few individuals or developing nations can afford enough guards or fences to protect endangered animals, but they can encourage education. This poster (left), commissioned by international wildlife associations, has been distributed throughout Kenya, where schools are sponsoring increasingly popular wildlife clubs. But as long as demand remains high, little will deter armed poachers.



ROBERT CAPUTO





It's a tough job for a tender mouth. A black rhino bull gently folds an acacia thorn, a favorite food, with his prehensile lip until, flattened, it can be chewed with huge molars. Where browse contains sufficient moisture, he can survive for weeks without water. Saucerlike ears rotate constantly, picking up sounds like the hissing of the red-billed oxpecker that harvests ticks, blood-sucking flies, and scabs from the inch-



thick hide. The rhino bathes by wallowing for hours in dust or mud. The habit of stomping in its own dung permits it to leave odor trails across the savanna, easily followed by its own kind.

and Burma. But in interviews with more than 400 practitioners of folk medicine, as well as rhino-horn importers, wholesalers, and consumers, I came across rhino horn as a love potion or a cure for impotence only in parts of western India. My conclusion is that the belief that peoples of the Far East use rhino horn for sexual purposes is wrong.

I also noticed that wherever rhino horn was used as a medicine, the Javan, Indian, and Sumatran species were preferred. But because of those species' growing scarcity, customers are turning more and more to the African horn.

The retail price for African rhino horn in Manila or Singapore is the equivalent of \$11,000 a kilogram. Asian rhino horn is considerably more; in Mandalay it retails for a staggering \$20,000 a kilo. Customers, of course, buy only a minute quantity at a time, never more than a few grams (far less than an ounce). Still, the cost is greater than it would be for almost any other drug.

IT WAS when I went to Burma that I found the oddest medicinal use of a rhino product. Zookeepers in Rangoon collected the urine of a baby rhino to be drunk for the cure of sore throats and to ward off asthma attacks.

"We give it to anyone who asks for it, but I think elsewhere it's actually sold, and in much larger quantities," one keeper said.

He was correct. The Calcutta zoo earned \$750 in just one year from the sale of an old rhino's urine. Strange, perhaps, but at least the animals don't have to be killed for it.

In Nepal I learned that the death of a rhino can have religious significance, for in Nepalese Hindu mythology the rhino is a special sacrificial animal, whose horn was given to it by Lord Vishnu.

In a rite called the Blood Tarpan, which every Nepalese king is required to perform upon his accession, rhino-blood libations are offered to the Hindu gods.

In Kathmandu I met Gen. Kiran Shumshere Rana. Though not a king, this distinguished gentleman was the retired commander in chief of the Nepalese Army and the son of a former prime minister—and he performed the Blood Tarpan at age 19.

He told me how he had gone to Chitawan Valley, where the country's only rhinos lived



and which had become the private preserve of the Ranas, to hunt a suitable animal. These Indian rhinos are a ferocious species, and their thick, folded skin, covered with tubercles resembling iron rivets, gives the impression of metal armor. But from atop an elephant, the young man brought a large male down with a single shot.

"Then," he said, "a team of helpers dragged the rhino to a nearby riverbank, where, using special knives, they disemboweled him. I climbed into the abdominal cavity they had made in the rhino and sat in its blood up to my waist for a few minutes while the Hindu priest officiating at the ceremony offered prayers. When I was directed to do so, I stood up, my hands cupped with

rhino blood, and held them outward to the gods in memory of my mother.

"Later I ate the meat between the hoof and ankle of one of the rhino's legs; the rest of the meat I gave to the villagers."

In January 1981 the same rite was repeated by Nepalese King Birendra, just outside what has become Chitawan Park, in honor of his late father, King Mahendra.

Although the rite requires the death of a rhino, it is so important that it guarantees the survival of the greater one-horned rhino in Nepal. No fewer than 500 armed soldiers guard the Chitawan rhinos. As a result, their numbers have risen from 160 in 1966 to 375 today—and there has been no rhino poaching inside the park since 1976.



BARON HUGO VAN LAWICK

Uncommon combatants, a black rhino cow with tail raised in fright confronts an aged Cape buffalo in Tanzania's Ngorongoro Crater. Charging, she stopped inches from his nose. The buffalo posed no threat, but the female may have feared for her calf.

*With less bluff and more blood, rhinos often battle each other. This old bull (**right**) was gored by a young male seeking a female in estrus. During the mating ritual females attack too, and bulls may even charge calves. Aggression can cost the rhino its horn, but it grows back, three inches a year.*



BECAUSE of the present demand for rhino horn and hide—and the high prices being paid for them—I fear that present conservation methods are not adequate to ensure a future for rhinos outside zoos or a few isolated reserves. The international community is only beginning to accept the necessity of attacking the problem by abolishing the demand.

At the moment, though, I don't think we have to worry about the Indian rhino species. Not only in Chitawan Park but also in Kaziranga Park in Assam, India, their numbers are increasing—from 970 in 1975 to 1,600 today, with another hundred or so outside the two parks. In fact, Kaziranga may have to relocate some of its rhinos to other Indian parks in the near future.

The other two Asian species—the Javan

and the Sumatran—present special difficulties. There is not a single one of either of these in any zoo in the world today, let alone a breeding pair.

Despite money and expertise provided by the World Wildlife Fund for Ujung Kulon Nature Reserve, there are probably only about 65 Javan rhinos alive today. Any let-up in their protection, or an outbreak of disease, could bring their extinction. I feel strongly that a small breeding group should be transferred to some place where modern scientific facilities could help them breed more successfully.

Although there are more Sumatran rhinos—some 500—are they too widely separated to survive? Among the few scientists to have attempted a detailed study of this species, Markus Borner recently spent three



years in Gunung Leuser, one of the two areas where they are said to be most plentiful.

"Yet in all that time," he told me, "I actually saw only one—when it charged through my camp quite unexpectedly—and that was just for a matter of seconds."

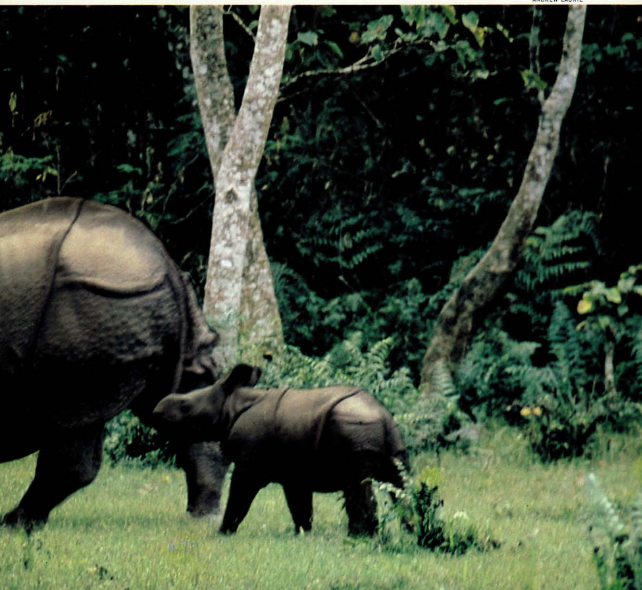
IN TOTAL NUMBERS, however, it is tropical Africa that is losing the most rhinoceroses. And it is too much to expect that countries destabilized by revolutions and civil wars will have much room on their agendas for the plight of the rhinos.

Wildlife expert Ian Parker sees another side of the problem. "Conservation is attempted today through the barrel of a gun," he told me.

"We rely on paramilitary forces equipped with the gadgetry of modern warfare

As if clad in armor, an Indian rhino and her calf trot through the riverine forest of Nepal's Royal Chitawan National Park. Deep skin folds give the plated effect. Here the king's soldiers patrol against poachers, and calves, born about three years apart, are only occasionally threatened by rhino bulls and tigers. As the rhino population rose, the two-ton animals ravaged cultivated fields on park borders, killing several villagers. Now farmers guard against nocturnal raids with lighted torches.

Some 2,500 years ago, carved rhino-horn cups were used in Persian courts to detect poison, a power later attributed to the horn of the legendary unicorn, with which the rhino has been confused.





Gentled by attention, a ten-year-old black rhino named Hoshim takes sugarcane from Courtland and Claude Parfet, owners of Solio Wildlife Sanctuary in Kenya. Here in the refuge, black rhinos, though breeding only once every five years on the average, have multiplied. The Parfets hope this year to fulfill their dream of reintroducing to a secure national park a breeding herd of the animal that Kenya President Daniel Arap Moi has declared a national treasure.

because conservation does not receive popular support. It is, instead, a source of tension, a matter of ethics and priorities at odds. That issue will have to be solved first if many wildlife species are to survive."

South Africa has shown that where the citizens support conservation, it can succeed—aided by an enlightened park management with adequate manpower and skilled administrators, all of them highly trained, motivated, and disciplined. Consequently, the country's black rhino population is increasing by more than 5 percent a year, and the number of white rhinos is growing at such a rate that culling will probably be necessary within 20 years.

It would be preferable, of course, if the surplus animals of South Africa's reserves and other African private game farms could be used to restock areas where the rhinos are going or are already gone. That is impossible, however, until the animals can be

protected—and until consumers stop their demand for rhino horn, that seems very unlikely.

I HAVE JUST RETURNED from another trip to Asia, where I tried to get wholesalers and retailers to substitute water-buffalo hide for rhino hide (they are used for the same medicinal purposes) and saiga antelope horn for rhino horn. And I would urge anthropologists to go to North Yemen to take on a study of how to convince the Yemenis to use another material for their dagger handles.

But more important than any of those things might be to get, for the first time, the full mutual cooperation of conservationists, wildlife administrators, traders, and law-enforcement officers.

Those hornless carcasses rotting in the sun are a blight not only on the landscape but also on the conscience of mankind. □