NATURAL HISTORY

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The Black Rhinoceros

In its world of scents and trails, mud baths and dust wallows, not much gets in the way of this behemoth. Except its two-legged enemy

by John Goddard

The full moon, which illuminated the open ground, did not penetrate the darkness behind the line of vegetation. Far away a night bird called, and an occasional grunt or shriek told of some unseen drama in the plant cover. Slowly, a huge gray form emerged from the shadow of a crooked acacia tree. Sniffing the well-used path, it lumbered down the bank toward the slow-moving river. At the water's edge it unhurriedly began to sip its fill. Two horns cast their silhouette against the silvery water.

By dawn the animal was several miles from the river, chewing on shrubs and bushes in the soft morning light. At midmorning, when the sun's heat began to tell of the day ahead, the animal settled down in the fine soil of an eroded termite hill and dozed until late afternoon.

The appearance of a black rhinoceros dominates almost any setting. Its bulk, encased in a thick, armor-like hide, serves as an efficient defense against almost all would-be predators. Reaching a length of twelve feet and weighing up to two tons, rhinoceroses have survived without the constant awareness of their surroundings so typical of the fauna of the African range—where death can follow an instant of carelessness. More ancient than many of the animals of the plain and savanna, they have followed along their scented trails since the Miocene. The formidable size and strength of a mature black rhinoceros also protects its young. Mother and calf are commonly seen ambling across the vast African landscape while other animals cautiously eye and stalk each other.

At birth a black rhinoceros calf weighs about 85 pounds and superficially resembles a small pig. Within a few hours it can stand and follow behind its mother, and whenever she stops, the young calf attempts to suckle, often butting its small head impatiently against the two-teated udder. While it is very young, the mother tolerates this rough behavior, but as the calf

grows stronger, she often kicks it gently away. Wherever the mother goes, the calf follows closely. When it grows larger, it often walks at her side; in this way, the young calf becomes oriented to its complicated habitat of shapes and scents.

During this period the young calf is most vulnerable to predation. At moments of danger, it instinctively snuggles close to the mother's side. This behavior usually deters any attack. I have witnessed five attempts by hyenas to grab young calves, all unsuccessful.

To lure the calf away from the mother, the hyena moves close in, in front of the calf, attempting to provoke a charge. Unless it comes very close, the mother usually ignores the hyena. If the calf charges, the hyena runs just ahead of it, slowly drawing it away. Then, when the calf has been enticed some distance away from the mother, the hyena will suddenly turn and attempt to grab one of the calf's extremities—an ear, the tail, or part of the hind leg. The calf, in its sudden terror, emits a loud squeal, and this distress signal brings an immediate and aggressive response from the mother in the form of a charge toward the hyena; the latter usually releases its hold quickly and lopes away. A calf is normally vulnerable to predation by hyenas only until it is about four months old. By this

Fighting can occur when one bull enters the home range of another. The animals often inflict deep bruises and cuts, which may fester for a long time.

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age the calf has grown so large that hyenas will no longer attack it.

Calves, and rarely adults, are preyed upon by lions, but since lions are opportunist hunters, they do not make frequent attempts to tackle a rhinoceros. One attempt by a male lion to kill an eleven-month-old calf was observed in Ngorongoro Crater in Tanzania during August, 1966; it ended with the lion being gored to death by the mother. Normally, adult rhinoceroses show little fear of lions, often walking deliberately in the direction of a pride as soon as they are aware of its presence.

If a young calf loses its mother, it is more vulnerable to predation, but orphaned calves will seek to join up with another mother-calf group, which offers some protection. Sometimes even fully grown bulls will adopt orphans. Twice I have seen adult bulls in company with young calves; on both occasions the pair fed and wallowed together, and traveled as a social unit.

A cow that is raising a calf usually does not successfully mate again until her offspring is approximately a year old and half her size.

Courtship can be a prolonged affair, and bulls will occasionally battle for the favors of a female. The bull is extremely cautious in his approach to the cow, which sometimes responds by knocking him around. The pair usually stand facing one another, gently rubbing horns. Depending on the receptivity of the cow, the bull either mounts her immediately or gallops away in a small circle, returning with a hesitant, short-step approach. This behavior may continue for several hours until mating eventually occurs. The mating bond is very impermanent, and observations of rhinoceros behavior in the wild indicate that the species is both polygamous and polyandrous.

The gestation period of the black rhinoceros ranges from 15 to 18 months. When the calf is from two and a half to three years old, it is ready for life on its own. Independence comes quickly; when a female gives birth to a new calf she will not tolerate the presence of her previous offspring.

The older calf is reluctant to leave the family group. On numerous occasions I have seen a young rhinoceros following its mother and her new calf at a distance of about fifty yards. If it follows too closely or if the mother becomes aware of its presence, she charges and chases it away. By now, however, it is thoroughly familiar with its surroundings and will establish a home range, part of which will be the area in which it lived as a calf.

Adult black rhinoceroses are basically solitary: bulls are frequently observed alone, and the usual pair-unit is the cow and her calf. However, home ranges of individuals can overlap considerably, providing frequent opportunities for contact between individuals.

The home range varies in size from six to fourteen square miles according to population density and to the availability of food and surface water. In areas where there is a supply of vegetation and water throughout the year, the rhinoceroses are extremely sedentary. Where food is not plentiful and water supplies are scattered, the home range tends to be larger. There is evidence that the rhinoceros can survive in some regions without free water, possibly by feeding on moisture-rich plants.

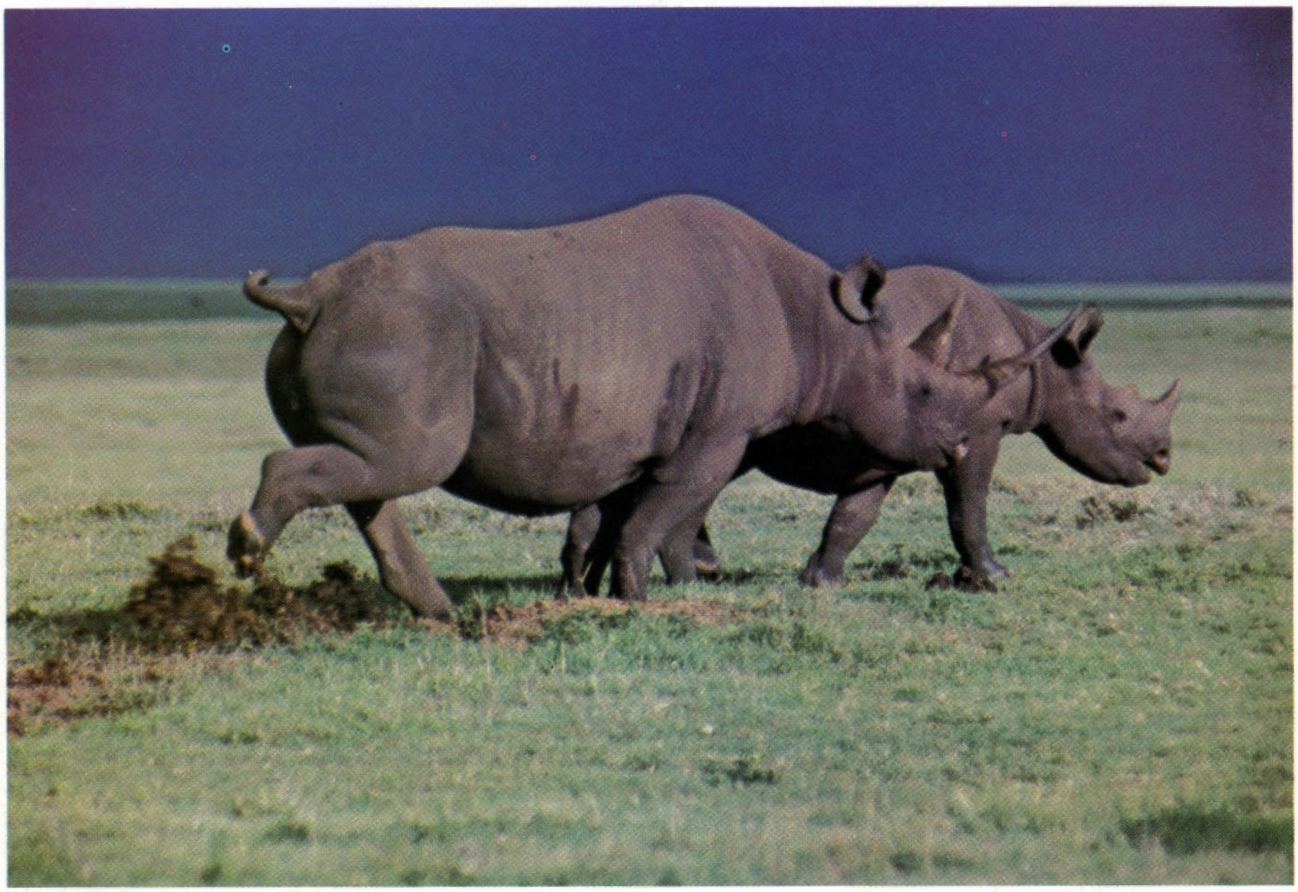
In general, immature animals cover a larger home range than adults. When a calf is rejected by its mother, it invariably attempts to join up with another rhinoceros as soon as possible. If tolerated, it normally stays with its new companion, which may be an adult or another immature individual. The rejected calf sometimes joins an adult whose home range overlaps, but extends farther afield, than the calf's. The movements of the immature animal are governed by the movements of the adult, thereby extending the former's range into new areas.

The larger home range of the immature animal and the mother's rejection of her old offspring may serve an evolutionary function: they assure population dispersal in a species that is sedentary and therefore susceptible to the effects of inbreeding. Studies suggest that population dispersal occurs when the animal is young; adult rhinoceroses show no tendency to disperse into

The black rhinoceros is primarily a browsing animal, although it does feed on ground plants. Its long upper lip enables it to strip leaves from branches.

The behavior of kicking apart dung piles may be related to the laying down of scent trails. Feces, which adhere to this cow's hind feet, could leave an odor along her path that other rhinoceroses would recognize.

MARK BOULTON, NATIONAL AUDUBON SOCIETY



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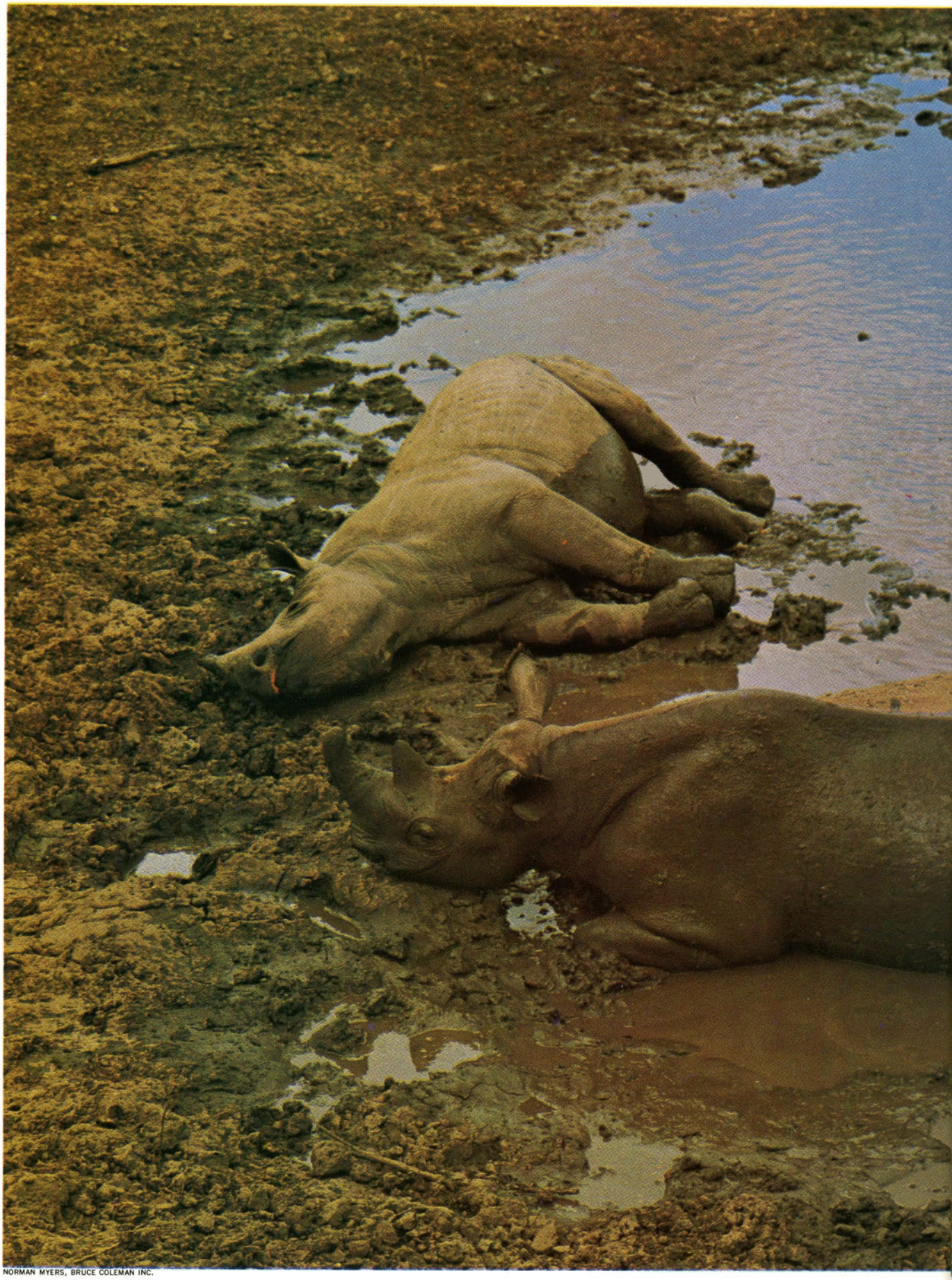

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Wallowing in a puddle coats the black rhinoceros with a layer of mud. This protects the animal against the numerous insects that feed on it.

new areas, even when the opportunity arises. They cling to their home ranges, probably staying within them for their entire lives.

Scent plays an important role in the lives of these animals and is probably responsible for the extensive behavioral repertoire performed at their dung piles. The animals sniff extensively at these deposits, thrashing their heads and upper lips from side to side in a wide sweeping motion. Occasionally they will use their horns to root in the deposit, followed by a shuffle through it with their front and hind legs held stiffly. The animal then defecates and scatters the droppings with sharp kicking motions of the hind legs. Even very young calves engage in this behavior.

The habit of kicking their dung had led to some fanciful interpretations in folklore. One version has it that the elephant does not like to see dung piles nearly the size of its own. It expressed its disapproval to the rhinoceros, which solved the problem by scattering its dung around. Another interpretation is that the rhinoceros is such a bad-tempered animal that after defecating, it turns around and in a fit of fury breaks up the pile.

If one watches an undisturbed rhinoceros on its home range, it can be seen that the animal walks with its head held close to the ground; actual sniffing can sometimes be detected. On observing this one afternoon, it occurred to me that the animal could be following some kind of scent trail, and that the explanation of the dung-kicking habit may be quite simple. By kicking and actually shuffling through the piles, a rhinoceros smears its hind feet with dung, which will leave a scent trail imprinted behind the animal. It could thus orient itself by following scent trails that are already set down in its home range, either its own or those of other, nearby animals.

To test my theory, I collected samples of feces from one rhinoceros, from other individuals whose home ranges overlapped that of the test animal, and from animals several miles distant. The samples were placed in new, carefully washed net bags, and then towed behind a vehicle as close as possible to the experimental animal.

While the results were inconclusive, they did demonstrate the ability of a rhinoceros to follow fecal scent trails. On one occasion a dung sample was collected from a rhinoceros; 48 hours later it was towed—at a speed faster than the animal could travel—from a point directly in front of the animal to another point two miles away. The route was zigzagged to determine if the animal actually followed the set trail; it did exactly, and in 38 minutes it was back alongside the vehicle, still sniffing the trail laid by the sample. It may be that the rhinoceroses in a given area can indeed recognize each other by scent trails and dung piles. Visual contacts would thereby be minimized and potential conflicts avoided. Given the animal's poor eyesight and pugnacious disposition, such an ability could have significant adaptive benefits.

The black rhinoceros has a hooked prehensile upper lip admirably adapted for browsing. This lip is, in fact, a miniature trunk. It can be curled around a leafy branch, which is then sheared with the front premolar teeth, leaving a straight, clean cut as though snipped with a pair of hedge trimmers.

The animals feed on a wide variety of the woody plants available, rarely on grass. In one study area of East Africa they were observed eating nearly 200 plant species from 49 botanical families. In spite of this wide selection, the rhinoceros shows distinct preferences. It is particularly fond of legumes, and when feeding in an herb patch will often select only certain specimens of the same plant species. Others, which appear to be identical, are sniffed but not eaten, while dry or with-

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A male rhinoceros often makes a number of cautious, short-step approaches—sometimes over a period of several hours—before a cow will accept his attentions.

ered plants are invariably rejected.

A major event in the day of a black rhinoceros is wallowing. In the rainy season the wallows may be seen all over the animal's home range; they are often old dust beds that have filled with rainwater. The wallowing animal thoroughly smears itself with mud; it rolls to one side, stands, then rolls on its other side. In this way the animal attempts to protect itself from the numerous biting flies and insects that feed on its hide. Dry wallowing in dust may serve a similar purpose.

The animals rest for a considerable part of the tropical day. Typically, they doze upright on their sternums; only occasionally are they seen lying flat on their sides. The bed is often in loose, fine soil adjacent to a termite hill, and several individuals will use the same spot over a period of time. Shade does not appear to be of primary importance in the choice of a resting place; I have often seen rhinoceroses resting in blazing sunlight, less than twenty yards from the shade offered by a large acacia tree. Even while dozing, their ears continue to rotate like radar antennae, alert for the smallest sound.

Rhinoceroses are often accompanied by tiny oxpeckers, which pluck parasites from their hides and ticks from skin creases, and feed on blood from the numerous sores frequently infesting the animals. When something unusual approaches, such as a man on foot, the birds screech and chatter. Occasionally they fly into the air, chirping loudly but quickly settle again on the animal. The rhinoceros is immediately alerted and will frequently walk or run away.

Only a few black rhinoceroses reach their potential life-span of about forty years. They often become mired in mud; sometimes they cannot extricate themselves. There are records of the animals charging trains and cars, often with fatal consequences. There are also records of rhinoceroses being killed by elephants. Little is known about the diseases that affect them, but they are known to be susceptible to various liver ailments.

It is the activities of man, however, that have caused the greatest reduction in rhinoceros numbers. Men have hunted them extensively because nearly all parts of the animal are used in folk medicine. For centuries they have played a role in a number of rituals and ceremonies, most of which required their sacri-

fice. In parts of Indonesia today, their blood is used at a deathbed ritual to facilitate the departure of a soul to paradise. Their urine is widely used as an antiseptic, and is believed to be a charm against evil spirits.

Perhaps the most unusual beliefs about rhinoceroses concern the properties ascribed to their horns. In parts of the Orient, the horns were made into goblets as gifts for royalty or aristocracy, for it was believed that these goblets could detect poison: a drink placed in them would supposedly bubble if poison was present. Interestingly, certain alkaloid poisons will effervesce when mixed with keratin compounds, the basic constituents of rhinoceros horns. The horn, placed under a bed, is also reputed to ease the labor of a woman in childbirth.

The most enduring belief about the horns is that when ground to a fine powder they will act as a potent aphrodisiac, but chemical analysis of the horn has not revealed any properties to support this. It seems possible that the belief arose partly because of the phallic symbolism that is apparent in the shape of the horn and partly because of the prolonged mating of the animal.

It is thought that the black rhinoceros formerly occupied approximately one-third of the land area of Africa south of the Sahara. Its distribution today shows that its range has been reduced considerably. There appears to be little doubt that contraction of its range has been brought about by indiscriminate poaching, hunting, and the destruction and modification of its original habitat by advancing agricultural settlement; the last factor has probably been most responsible for its disappearance.

Hunters have traditionally regarded the rhinoceros as one of the most dangerous beasts alive, but their accounts of encounters with the animals are often embellished beyond credibility. Rhinoceros heads, massive and seemingly menacing even in death, decorate trophy rooms and museums throughout the world. Books, journals, and periodicals abound with tales of the charging rhinoceros, the last-minute shot coolly fired at point-blank range, the narrow escape from certain death—these are the ingredients of a legend still implanted in the public mind.

As in all such stories, there may often be some element of truth. The rhinoceros will indeed charge, and the animal has been responsible for the death of hunters and others. But like most hunting tales about African animals, the danger is greatly overrated. The same tales fail to inform the reader that under certain circumstances it is possible to stalk to within ten yards of a black rhinoceros without it ever becoming aware of the observer's presence; that, protected by a tree or rock, a hunter can "call" a rhinoceros and shoot it from a distance of less than two yards if he is so inclined; that the attendant oxpeckers and cattle egrets invariably betray the location of the animal, allowing the hunter to take advantage of the element of surprise, or to take evasive action if necessary; and that the rhinoceros sometimes has considerable difficulty in detecting the source of danger even in sparse cover, presumably because of its myopia.

One major ecological problem that could seriously affect its welfare is the effect of other animals, most notably the elephant, on its habitat. Recent studies in East Africa have shown that in several of the great parks, overpopulations of elephants have resulted partly from natural increases under conditions of total protection and partly from dispersal from outside the parks, where agricultural settlement has taken over land formerly occupied by elephants. This has inevitably forced the elephant into areas of sanctuary, where they have had a marked effect on the vegetation, usually in the form of large-scale destruction of woodland. With the large amount of dead and decaying woody material and debris, hot ground fires sweep through, their spread aided by the inevitable in-

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A calf, which weighs about 85 pounds at birth, receives a rich supply of protein from its mother's milk. A cow lactates for several months.

vasion of the open areas by grasses. These fires, in turn, tend to kill off or retard new growth of browse. In general, the combined effect is to convert woodland to grassland, a process that could ultimately lower the carrying capacity of the park for the rhinoceros.

The sedentary character of the rhinoceros presents advantages and disadvantages for conservation of the species. It may be expected to survive in small isolated populations even though surrounded on all sides by cultivated areas. Conversely, when settlement invades its habitat, it shows no tendency to move away. In most such cases, it is eventually shot.

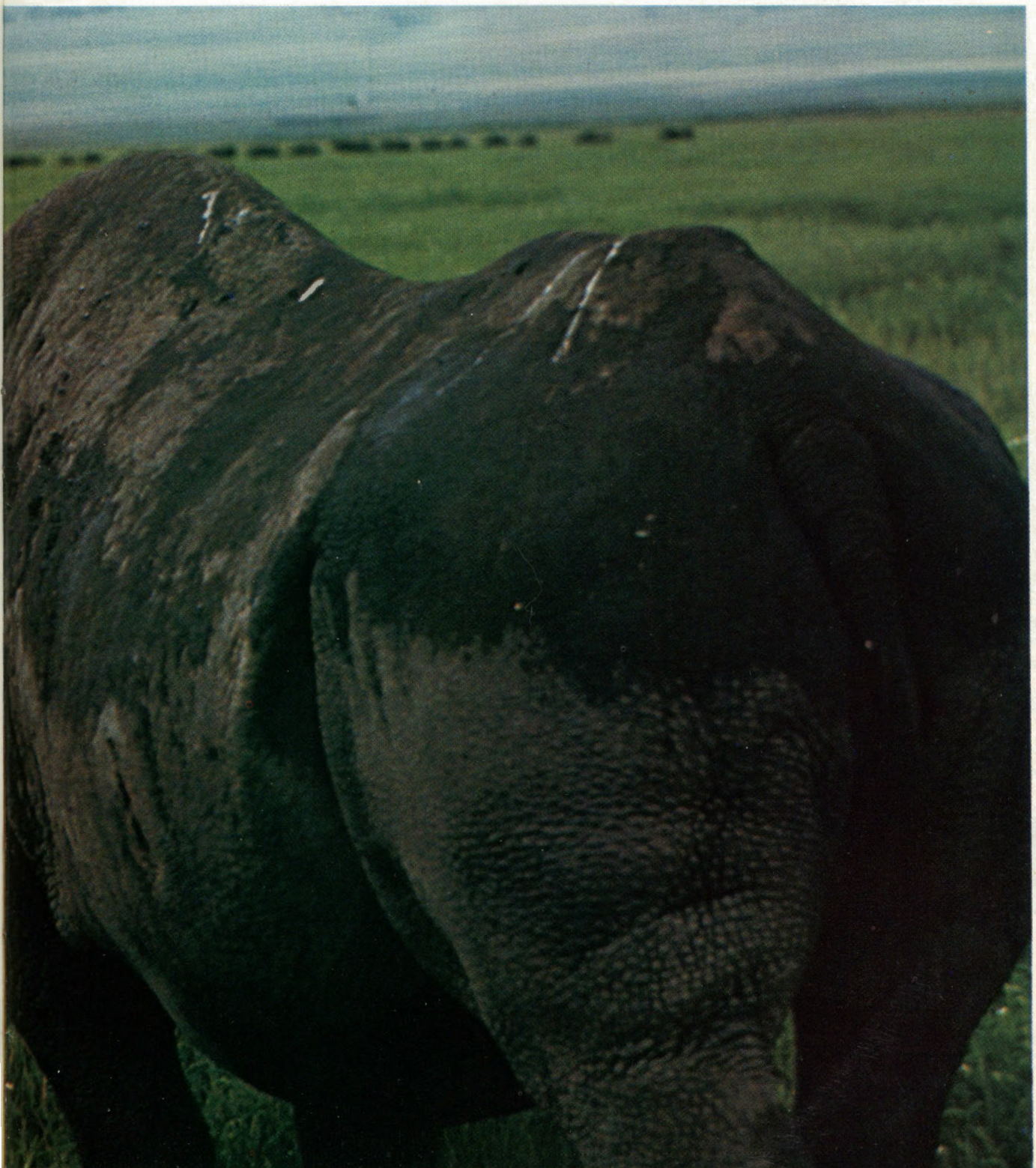
Boundaries of national parks and game reserves are usually established by some convenient reference to topography, roads, or watercourses, and rarely consider the migratory patterns of the animals that utilize the park. The black rhinoceros is a species that may be least affected by this and would be expected to receive adequate protection in well-patrolled game parks. However, the regular habits of some individuals make them easy prey for poachers who are familiar with their habits and daily movement patterns.

The late Arthur Ritchie, chief

KOJO TANAKA, ANIMALS ANIMALS

game warden of Kenya from 1923 to 1948, was a fine field observer and naturalist whose special interest was the black rhinoceros. A decade ago he wrote: "In these circumstances, they will only survive in sanctuaries and reserves where their interests are absolutely paramount. In my belief there is no animal in the world today so greatly in need of skilled and sympathetic care and conservation. We must not neglect nor unduly delay the provision of such treatment."

His words are even more applicable today. Seemingly so invulnerable, these huge herbivores are dependent on a habitat that continues to shrink. In the end, the only hope for the black rhinoceros is that man will not be shortsighted, that he will understand and accommodate the needs of this ancient form of life. ■



Just prior to mating, a pair of black rhinoceroses will often engage in gentle, back and forth rubbing of their heads and horns.