

# THE NEW NATURAL HISTORY

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In some parts the South-American Indians track the tapir to its lair, and shoot it as it lies. In Paraguay, when the hunters capture a young tapir of too large a size to be carried on a horse in front of the rider, they bore a hole in one side of the snout through which they pass a thong, and the animal will then follow readily enough when led.

**Foes** Next to man, the worst foes of the tapir are the larger cats; the jaguar preying largely on the American species, and the tiger attacking its Malayan cousin. It is said that when an American tapir is attacked by a jaguar, it immediately rushes into the thickest cover in the hope of dislodging its assailant, which from the thickness of the animal's hide is unable to obtain a firm hold on its back. It is further reported that the tapir is not unfrequently successful; and, in any case, many of these animals are killed with the marks of jaguar's claws on their backs.

**Succession of Teeth** Before leaving these animals, it may be mentioned that the whole of the four premolar teeth on each side of the upper jaw are preceded by milk-teeth, whereas in the pig and other Even-Toed Ungulates the first of these teeth never has a deciduous predecessor, as, indeed, is the case with other groups of Mammals. Some rhinoceroses, however, resemble the tapirs in having the first premolar preceded by a milk-tooth, although this seems to be merely an individual, and not a specific peculiarity.

## THE RHINOCEROSSES

### Family RHINOCEROTIDÆ

Although inferior in length of body, and probably also in weight, to the hippopotamus, the larger species of rhinoceroses exceed it in height, and, therefore, vie with it in claiming the position of being the Mammals next in point of size to the elephants. Unlike the tapirs, the various species of rhinoceroses, all of which are now confined to the Old World, differ very markedly from one another in structure — so much so, indeed, that by many writers they are divided into several genera; and there is also considerable disparity in point of size. In spite, however, of these minor differences, all these animals are so much alike in general appearance, that it seems preferable to include the whole of them in the single genus *Rhinoceros*. All the existing rhinoceroses differ from tapirs in having but three toes on both fore and hind-feet, but since there are some extinct species with four toes to the front limbs, this point of distinction cannot be regarded as a very important one. The presence of one or two horns in the middle line of the front of the head might at first sight be regarded as a more valuable diagnostic characteristic, but since these appendages are always or frequently absent in the female of one of the living Indian rhinoceroses, and are invariably wanting in certain extinct kinds, it will be obvious that other features must be sought that will distinguish these animals from the tapirs.

**Teeth** Such characteristics are to be found in the cheek-teeth, of which two from the upper jaws of certain extinct species are represented in the figures on the next page. In the molar teeth of the upper jaw the two outer

TO VISIT  
AMERICAN

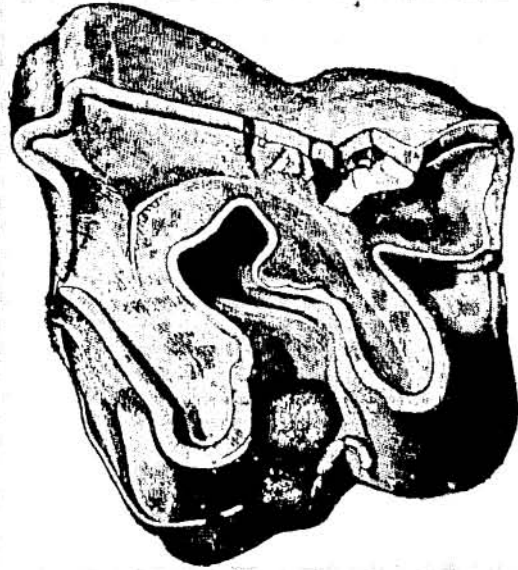


INDIAN RHINOCEROS

columns have completely coalesced so as to form a continuous external wall to the crown; this wall being sinuous, and in some cases (as in the upper figure) forming a prominent buttress at the front outer angle of the crown. From this outer wall proceed two continuous, oblique, transverse ridges separated from one another by a deep valley, interrupted by projecting processes from one or both ridges, and sometimes also from the outer wall. This middle valley is usually quite free from cement; and its form, as likewise the relative height of the whole crown, varies considerably in the different species. Instead of having the simple, transverse ridges found in those of the tapirs, the lower cheek-teeth of the rhinoceroses have a pair of crescents, placed one in front of the other. On each side of both the upper and lower jaws there are seven cheek-teeth; but the last molar in the upper jaw differs from the rest in having its hinder ridge more or less aborted, so that the form of the crown is generally triangular.

As regards their front teeth, the different species of rhinoceroses present a considerable amount of variation, some of them having such teeth in both jaws, while in others they are totally absent; but there are never any canine teeth or tusks in the upper jaw, and the number of upper incisor teeth never exceeds two pairs. In the lower jaw there may be a pair of large, pointed and nearly horizontal tusks, and between them a small pair of incisor teeth.

**Form** All the living rhinoceroses are animals of large size and heavy build, with the legs comparatively short and stout, although less so than in the hippopotamus. Each of the toes is furnished with a relatively-small, but broad and well-defined, hoof-like nail. The head is large and elongated, with a concave profile, and



LEFT UPPER MOLAR TEETH OF TWO EXTINCT SPECIES OF RHINOCEROSES.  
(Both considerably worn by use.)

the erect, oval ears placed very far back. The eyes are very small in proportion to the size of the head; and the upper lip is generally, although not invariably, prehensile, and prolonged beyond the extremity of the lower one. The thick skin is either naked or sparsely clad with hair, and may be thrown in certain parts of the body into a series of deep folds. The tail is thin and of moderate length.

**Horns** The horns, which form the characteristic feature of the physiognomy of the living species, are composed of a closely-packed mass of horny fibres, growing from the skin, and having no connection with the bones of the skull, although there are prominences on the latter beneath each horn. The skull, as shown in the figure of that of an extinct species given in the sequel, is characterized by its elevated occipital region, long, curved profile, the absence of any bony bar at the hinder part of the socket of the eye, and the large size of the nasal bones, which are completely fused together. In those species with but one horn this is carried upon the nasal bones, and the front horn of those with two of these appendages has a similar situation, but the second horn, when present, is placed on the frontal bones.

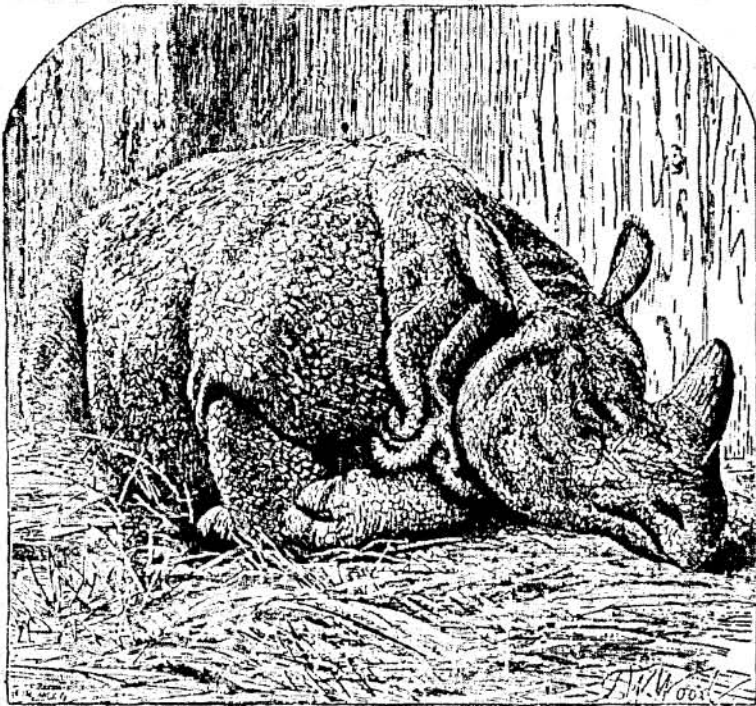
**Habits** Rhinoceroses are stupid and somewhat timorous beasts, generally striving to escape from man, although when brought to bay exceedingly fierce, and consequently from their great size very dangerous. Although the African species are entirely dependent on their enormous horns, as weapons of offense and defense, the Asiatic kinds, in which the horns are smaller, seem to rely chiefly upon their sharply-pointed lower tusks which are capable of inflicting terrific gashes. All are mainly nocturnal, and while some resemble the tapirs in frequenting tall grass jungles and swampy districts, others seem to prefer more or less open plains. Their food is entirely vegetable; but whereas some species subsist almost exclusively on grass, the food of others consists mainly of twigs and small boughs of trees; this difference in diet being correlated with a difference in the structure of the molar teeth. At the present day these animals are restricted to South-eastern Asia and Africa; and they may be divided into two main groups according to their geographical distribution, the Asiatic group being again subdivided into two minor groups.

#### THE ASIATIC RHINOCEROSSES

The whole of the three species of Rhinoceroses inhabiting Asia are characterized by the skin being thrown in places into thick folds, and by the presence of teeth in the front of the jaws; the horns being either one or two in number.

**Indian Rhinoceros** By far the largest of these three is the great one-horned Indian rhinoceros (*R. unicornis*), which may be conveniently designated as the Indian rhinoceros *par excellence*, and is the one which has been longest known in Europe from living examples, a specimen having been sent to Portugal as long ago as the year 1513. In this species there is but a single nasal horn; and the skin, with the exception of that of the tail and ears, is naked, and on the sides of the body studded with a number of large convex tubercles, reminding one of the rivets in an iron boiler, which are the largest on the fore and hind-quarters, where

they may be as much as an inch in diameter. The skin of the body is divided into a number of shield-like pieces by the aforesaid folds. Thus there is a fold before and behind each shoulder, marking off a large triangular shield covering the shoulder; and another in front of each thigh dividing the large saddle-shaped body shield from the one on the hind-quarters. The folds behind the shoulder and in front of the hind-quarters continue completely across the back, but the one in front of the shoulder inclines backward and dies out close to the second great fold. Other folds form great rolls of skin on the neck, while there are others below the shields on the fore and hind-quarters and one situated behind the buttocks which forms a groove for the reception of the tail. The head is very large in proportion to the body, with



GREAT INDIAN RHINOCEROS IN THE ZOOLOGICAL GARDENS.

the occipital region of the skull very much elevated; and the ears are large, with their tips fringed with hairs. The horns are large in both sexes; and the color of the skin is a uniform blackish gray. In height the Indian rhinoceros stands from five feet to five and three-fourths feet at the shoulder. In a male standing five feet nine inches at the shoulder, measured by General Kinloch, the length from the tip of the snout to the root of the tail was ten feet six inches, the length of the tail two feet five inches, and the girth of the body nine feet eight inches. The length of the horn is seldom more than a foot, although Jerdon says that there are instances on record of horns of two feet in length, and one in the British Museum measures nineteen inches.

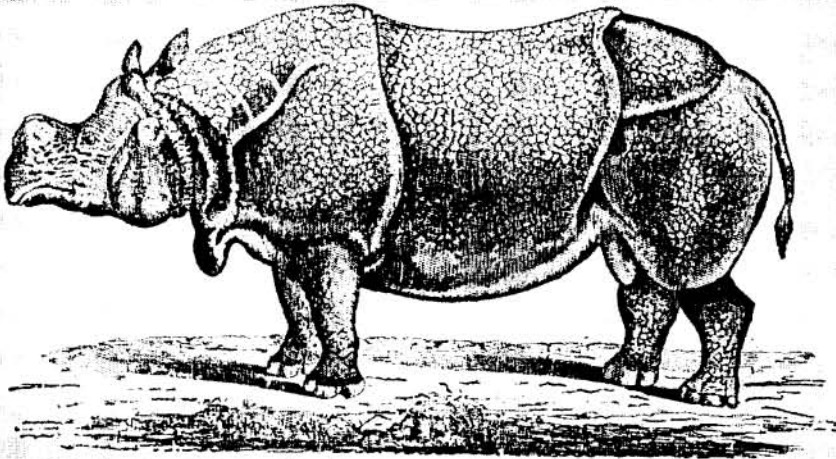
**Teeth** The Indian rhinoceros is further characterized by its teeth. As a rule, there is but a single pair of broad incisors in the upper jaw, although in some cases there may be a smaller pair behind them. In the lower jaw there is one pair of long, triangular, pointed tusks, and between them a pair of small, cylindrical incisors which can be of no functional importance. The upper molar teeth have tall crowns, and in the absence of a buttress at their front outer angle, and the flat plane formed by their worn surface, resemble the one represented in the lower figure on p. 1051. They are, however, distinguished from the latter by the presence of a small, vertical plate, projecting from the outer wall into the extremity of the middle valley. It will be obvious that this flat plane of wear of the cheek-teeth implies that the jaws have a backward and forward grinding motion, and not a champing action; such a mode of mastication being similar to that existing in horses and cattle.

**Distribution** This rhinoceros is exclusively confined to India, and at the present day, according to Mr. Blanford, is almost restricted to the Assam plain, being rarely, if ever, found to the westward of the Tista river. Twenty or thirty years ago, it was, however, still common in the so-called terai country at the foot of the Sikkim Himalayas, while some years earlier it frequented the sub-Himalayan districts of Nipal, and ranged as far west as Rohilcund; while the writer last quoted believes that, about the year 1850, it also occurred in the grass jungles of the Ganges valley at the north end of the Rahmahal hills in Bengal. In the early part of the sixteenth century it ranged over the Punjab as far westward as Peshawur; and since its fossilized remains are found in the Northwest Provinces, the Narbadá valley, and Madras, it may be inferred that the Indian rhinoceros formerly ranged over the greater part of Peninsular India, in localities suited to its habits.

**Habits** The Indian rhinoceros is a denizen of the great grass jungles that cover such a large portion of the plains of India, and from this circumstance, coupled with the general resemblance of its molar teeth to those of the African Burchell's rhinoceros, which is known to be a grass eater, it may be assumed that its food is chiefly grass. Regarding the density and height of these jungles, General Kinloch writes that, "year after year, in the short space of two or three months, these giant grasses shoot up to a height of from twenty to thirty feet, forming, with the wild cardamum, various other broad-leaved plants, and numerous creepers, a tangled cover which shelters the elephant, the rhinoceros, and the buffalo, as effectually as a field of standing corn affords concealment to the partridge or the quail. I have seen a line of about fifteen elephants beating a strip of reeds not more than two hundred yards in width, and I could hardly see the grass shake. There was not as much commotion or indication of what was going on, as would be caused by a pack of beagles drawing a gorse cover. Runs or tunnels among the high reeds, like magnified 'meuses' of hares and rabbits, show that the same paths through the thick jungles are generally made use of."

The rhinoceros chiefly frequents such portions of these grass jungles as are on swampy ground, and although it is in general a solitary animal, the writer just quoted states that he has known half a dozen individuals roused from a belt of not more than half a mile in length by three hundred or four hundred yards in width.

Like tapirs, the Indian rhinoceros is fond of a mud path. Although there are many stories extant as to its ferocity, and more especially its enmity to the elephant, it appears that this animal is generally quiet and harmless. Even when wounded, according to Mr. Blanford, it is but seldom that it charges home; but when it does attack, the sharp lower tusks are used much after the same manner as those of a wild boar. The only sound that this rhinoceros utters is a peculiar grunt, which is repeated at frequent intervals during excitement. The usual gait of this rhinoceros is a long, swinging trot, but when disturbed, it can break into an awkward but very rapid gallop. Only a single calf is produced at a birth, but there is some uncertainty as to the length of the period of gestation, an old writer stating that it is nine months, while a more recent authority affirms that it is nearly or quite double as long. Since rhinoceroses, so far as we are aware, have not bred in captivity in Europe, the point is one not likely to be soon cleared up. The Indian rhinoceros thrives well in confinement, and frequently lives in that state for a long period. One specimen ac-



GREAT INDIAN RHINOCEROS.

quired by the London Zoological Gardens in 1834 lived till 1849, while a second, purchased in 1850, died in 1874, and a third, presented in 1864, was still flourishing in 1894. Mr. Blanford states that he has heard of captive specimens living fifty or sixty years, and Mr. Brian Hodgson was of opinion that the natural term of this animal's life is upward of a century.

From the immense thickness and apparent toughness of its enormous folds, it was long considered that the hide of the Indian rhinoceros was bullet proof, and that the only places where the animal was vulnerable were the joints of the armor. General Kinloch relates an amusing story of a soldier in India, who had heard of this legend, firing point-blank at a tame rhinoceros which had been captured by his regiment during the Mutiny, in order to obtain ocular proof of its truth. Needless to say, as the shot was well aimed, the unfortunate animal fell dead, which meant a considerable loss to the regimental prize fund. And we may mention here that the Indian rhinoceros, like all its kindred, when shot sinks down in its tracks, and lies as if asleep, instead of falling over on its side like most other Mammals.



As a matter of fact, the skin of the living animal is quite soft, and can readily be penetrated in any place by a bullet, or easily pierced by a hunting knife. When dried it becomes, however, exceedingly hard; and it was formerly employed by the Indian princes in the manufacture of shields for their soldiery. General Kinloch states that "if polished the hide is very handsome and semitransparent, and when held up to the light looks exactly like tortoise shell, the tubercles giving it a beautiful mottled appearance."

The horn is used by the Hindus (to whom in common with the natives of most parts of India, the animal is known by the name of *gaimda*) in some of their religious ceremonies; when manufactured into cups it is considered by the Chinese to possess the property of indicating the presence of poison.

Hunting There are two modes, according to General Kinloch, of hunting the Indian rhinoceros—"one by quietly tracking up the animal on a single elephant until he is at last found in his lair, or perhaps standing quite unconscious of danger; the other, by beating him out of jungles with a line of elephants, the guns being stationed at the points where he is most likely to break cover. In the latter case it is necessary to have reliable men with the beaters, who can exercise authority and keep them in order, for both mahouts and elephants have the greatest dread of the huge brute, who appears to be much more formidable than he really is."

The same writer gives his experience of rhinoceros hunting as follows. On a certain occasion the General and his party "had tracked a wounded buffalo into a large and very thick cover, into which it was useless to follow him with any chance of getting a shot. The three guns, therefore, went on ahead, and took up their positions at the other end of the cover, while the pad elephants were ordered to form line and beat steadily through the jungle. After waiting a long time at my post I heard some large animal crashing through the reeds, and as the line of beaters advanced the waving of the grass betrayed its movements. It came on very slowly, occasionally stopping for some time to listen, and again making a cautious advance. I remained still as death, but I was in a great state of anxiety lest my elephant should become uneasy and give the alarm. Fortunately, he remained silent, and at length the rhinoceros, anticipating no danger ahead, and pressed by the steadily advancing line of elephants behind him, poked his ugly head out of the reeds within twenty yards of me. I could only see his snout and his horn, and aimed above the latter for his forehead. I either took a bad aim, or my elephant moved slightly as I fired, for, as I afterward found, my bullet merely grazed the snout, cutting a deep furrow along the base of the horn. As the rhinoceros wheeled round, I gave him another bullet in the centre of his ribs, and he rushed back into the reeds and through the beaters with an angry grunt. On search being made in the jungle, it was found that the second bullet had done its work, the huge animal lying dead with its legs folded beneath the body in the usual recumbent posture."

Javan

Rhinoceros

The Javan, or lesser one-horned rhinoceros (*R. sondaicus*), is an altogether smaller animal than the preceding, with the head relatively less large in proportion to the body, although its height at the shoulder is scarcely, if at all, inferior. The skin, which is nearly or quite naked, lacks

the large tubercles of the Indian rhinoceros; while the fold in front of the shoulder, instead of inclining backward, is continued right across the body like the other two main folds. Superficially, the skin is divided by a network of cracks into a number of small mosaic-like discs. The great folds of skin which are so conspicuous in the neck of the Indian rhinoceros are in this species much less strongly developed. The general color is a uniform dusky gray. The skull is less elevated than in the larger species in the occipital region; but there are the same number of front teeth. In structure, the upper molar teeth are, however, simpler, resembling the lower of the two figured on p. 1051; and their crowns are not so tall. Measurements of wild individuals appear to be very few, but in a large female the height at the shoulder was five and one-half feet. The female is generally or invariably hornless.

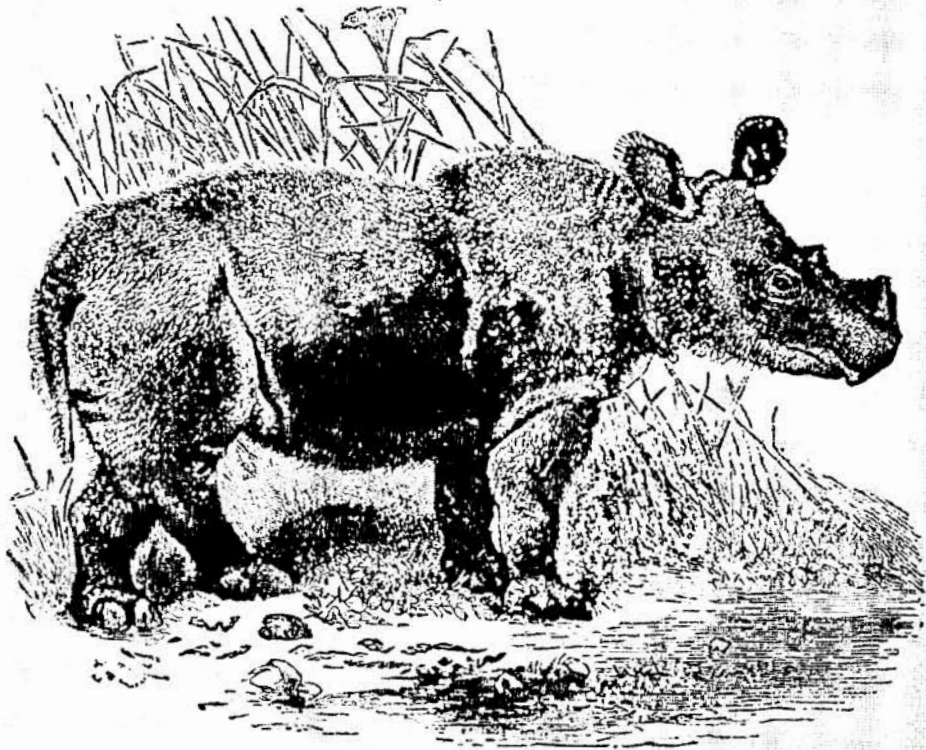
**Distribution** This species has a much more extensive distribution than its larger cousin. There is no evidence that it ever occurred in Peninsular India, but it is found in the Bengal sundarbans and portions of Eastern Bengal, while it has been met with in the Sikkim "terai." From the valley of Assam it ranges eastward through Burma and the Malay Peninsula to Sumatra, Java, and Borneo; its partially fossilized remains occurring in the latter island.

**Habits** Mr. Blanford observes that this species "is more an inhabitant of the forest than of grass, and although it is found in the alluvial swamps of the sundarbans, its usual habitat appears to be in hilly countries. It has been observed at considerable elevations both in Burma and Java." Indeed, there is evidence that it probably ascends occasionally to as much as seven thousand feet above the sea level. This species being a forest-dwelling one, while its molar teeth are of the same pattern as those of the leaf and branch-eating common African rhinoceros, it is pretty certain that its food must be of the same general nature as that of the latter. In disposition the Javan rhinoceros is said to be more gentle than the large Indian species, and it is not unfrequently tamed by the Malays. The horns are never large, and afford but poor trophies to the sportsman.

**Allied Siwalik Rhinoceroses** In the Pliocene rocks of the Siwalik hills at the foot of the Himalayas there occur remains of a single-horned rhinoceros (*R. sivalensis*), which appears to have been closely allied to the Javan species, of which the original home may accordingly have been India. More remarkable, however, is the occurrence of a fossil rhinoceros in the interior of the Himalayas, at an elevation of about sixteen thousand feet above the sea level, which likewise seems to have been related to the same species. It may be added that another fossil Indian rhinoceros (*R. palæindicus*), of which an upper molar tooth is represented in the lower figure on p. 1051, appears to have been the forerunner of the living great Indian rhinoceros; its molar teeth approximating to those of the latter, although of a rather less complex structure.

**Sumatran Rhinoceros** Reverting to the living Asiatic species, the last of all is the Sumatran rhinoceros (*R. sumatrensis*), which is mainly characteristic of the countries to the eastward of the Bay of Bengal, occurring but rarely in Assam, although a single example has been obtained from Bhutan. From Assam it ranges through Burma and the Malay Peninsula to Siam, Sumatra, and Borneo, but it is quite unknown in Java.

This is the smallest of all the living species of rhinoceroses, and differs from the preceding kinds in carrying two horns. It is further distinguished by its hairiness, although there is a certain amount of individual variation in this respect. As a rule, the greater part of the body is thinly covered with brown or black hair of considerable length, while there are larger or smaller fringes of hair on the ears and tail. The skin, which is rough and granular, and varies in color from earthy brown almost to black, has the folds much less developed than in the single-horned species, and only the one behind the shoulders continues right across the back. The two horns are placed some distance apart, and when fully de-



THE SUMATRAN RHINOCEROS.

(The horns, as in most captive specimens, are abnormally short.)

veloped are thick and massive at the base, but very slender above, the front and longer one sweeping backward in a graceful curve. In many specimens the horns are, however, very short, and in examples kept in confinement like the one from which our figure is taken, they become worn down to mere stumps. The Sumatran rhinoceros differs from its two Asiatic cousins in having lost the pair of small incisor teeth in the lower jaw, in the front of which only the tusks remain, and even these are sometimes shed in old age. In these respects, therefore, this species, concomitantly with the presence of two horns, shows an indication of approximating to the African rhinoceroses.

In addition to the variation in the degrees of development of the hair, this species shows considerable individual differences in color, and also in the relative

breadth of the skull. A specimen purchased in 1872, by the Zoological Society of London, for over five thousand dollars, and exhibited in their gardens, differed from the ordinary form by its superior size, paler and browner color, smoother skin, shorter and more thickly-tufted tail, and the longer, finer, and more reddish-colored hair; the latter forming a long fringe on the ears, of which the insides were naked. This animal had also a much wider head than ordinary. It was accordingly regarded as a distinct species, under the name of the hairy-eared rhinoceros (*R. lasiotis*); but there is little doubt that it cannot be considered as anything more than a well-marked variety of the Sumatran species.

There is considerable variation in regard to the dimensions of this species, but Mr. Blanford considers that from four to four and one-half feet will represent about the average height at the shoulder. In the above-mentioned specimen the height at the shoulder was four feet four inches, and the length from the tip of the snout to the root of the tail eight feet; the weight of the animal being about two thousand pounds. On the other hand, in an adult female from the Malay Peninsula, the shoulder height was only three feet eight inches. There is also great variation in regard to the length of the horns, the back one being in some cases reduced to an almost invisible knob. Mr. E. Bartlett gives the following particulars of Bornean specimens. In one example, the front horn was four and one-half and the second two inches in length; in a second, while the front horn measured five inches, the back one was a mere knob; and in a third, the front horn had a length of nineteen inches with a girth of sixteen inches, the second horn being fairly developed, although not more than about three inches in height. A single specimen of a front horn had a length of eleven inches, with a basal girth of eleven and one-half inches; but the maximum recorded length is upward of thirty-two inches along the curve.

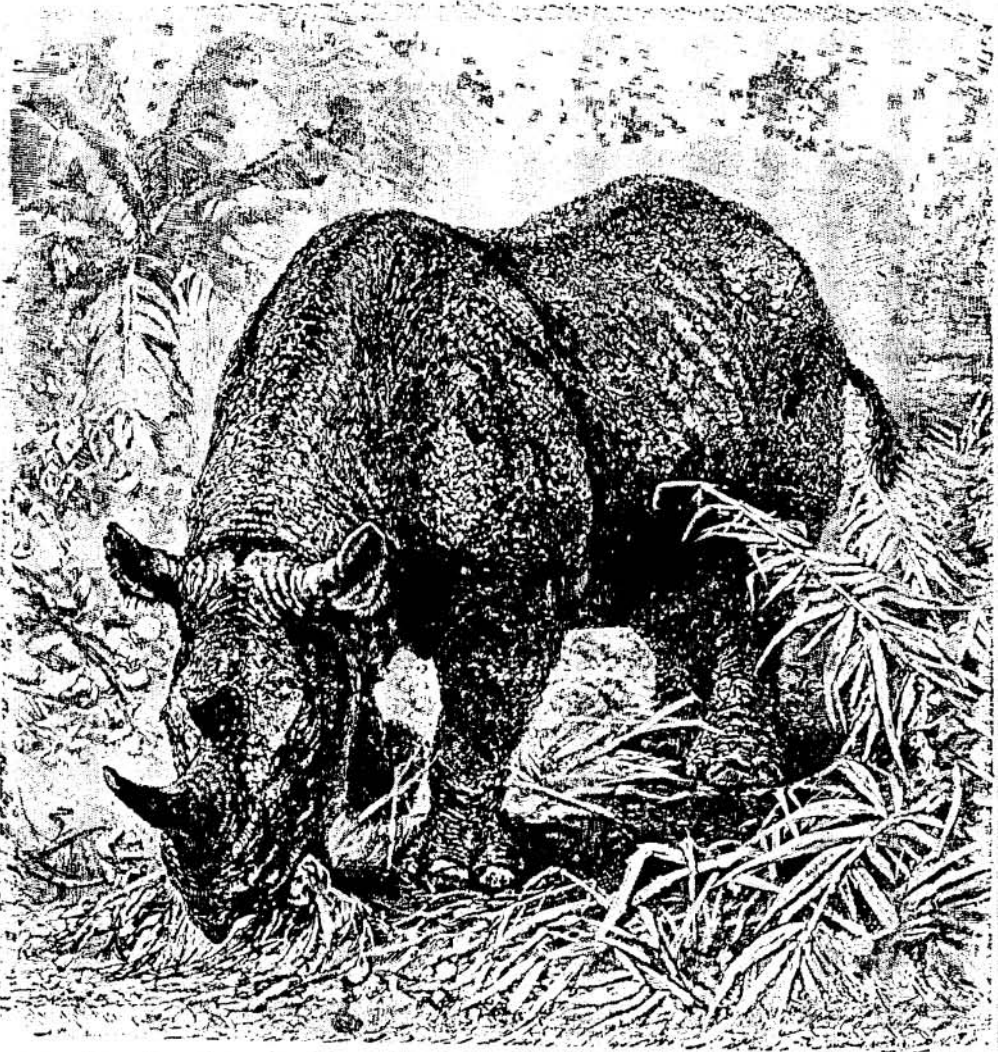
**Habits** The molar teeth of this species are almost indistinguishable from those of the Javan rhinoceros, and as its habits appear to be very much the same as those of the latter, the diet of the two is probably also similar. The Sumatran rhinoceros inhabits hilly, forest districts, and it has been observed in Tenasserim at an elevation of four thousand feet above the sea. It is a good swimmer, and is reported to have been seen swimming in the sea in the Mergui Archipelago. Although shy and timid in the wild state, in captivity it soon becomes tame.

Mr. E. Bartlett states that in Borneo the dyaks are very partial to the flesh of this species as an article of diet. And he adds that the kyans—a race very distinct from the dyaks—procure the horns for barter, for which they receive a high price from the Chinese, who import them to China for medicine. The horns are ground into powder for some diseases, while others are cut into minute fragments to carry about the person. The same writer further states that this rhinoceros is becoming extremely rare in the province of Sarawak, on account of the value set upon its horns, but in Central and North Borneo in the very old jungles it is more plentiful.

In 1872 a Sumatran rhinoceros, recently imported into London, gave birth to a calf; and this event afforded Mr. A. D. Bartlett data for considering that the period of gestation was a little over seven months. This however, as Mr. Blanford points

out, seems a very short period for such a large animal, and contrasts very markedly with the length of time assigned by Hodgson to the great Indian rhinoceros.

No fossil species allied to the Sumatran rhinoceros has hitherto been obtained from the Tertiary deposits of India, whence we may conclude that the latter is probably a comparatively-recent immigrant into Northeastern India. Schleiermacher's rhinoceros (*R. schleiermacheri*) of the



THE COMMON AFRICAN RHINOCEROS.  
(One-twenty-ninth natural size.)

Miocene and lower Pliocene deposits of France and Germany appears, however, to have been very closely allied to the Sumatran species, and thus affords, in common with some other fossil Mammals, evidence of an eastward migration of types formerly inhabiting Western Europe.