

THE  
**MENAGERIES.**

---

**QUADRUPEDS,**

*DESCRIBED AND DRAWN FROM LIVING SUBJECTS.*

---

**VOLUME THE THIRD.**



**LONDON:**  
**CHARLES KNIGHT AND CO.,**  
22, LUDGATE STREET.

---

1840.

# THE MENAGERIES.

## CHAPTER I.

### THE RHINOCEROS.



*Common Indian Rhinoceros.*

THE genus *rhinoceros* was placed by Linnæus in his order *bruta*; an order including the sloths, the anteaters, the manis, the armadillos, the elephant, and

the morse, but excluding the horse, the hippopotamus, the tapir, and the hog, which ranged under his genus *belluæ*. In the system of Cuvier, the genus *rhinoceros* ranks in the order *pachydermata*,\* an order which, notwithstanding the chasms that intervene between the forms it embraces (chasms which the discoveries of geologists are constantly filling up), we cannot but regard as based upon solid principles. Of this order (fossil forms being excepted), one genus alone is exclusively restricted to the new world, viz., that including the peccaries (genus *dicotyles*, Cuv.), and one is divided between South America and the larger islands of the Indian archipelago, together with the peninsula of Malacca—we mean the genus *tapir*, Linn., of which there are three species known, and of these two are American. All the other genera are divided between Africa, Asia, and Europe, though, as might be expected, Europe claims the smallest share of indigenous *pachydermata*. It is in this order that we find the hugest and most ponderous of *terrestrial mammalia*—animals requiring for the due development of their colossal frame the warmth of an intertropical climate, and a never-failing supply of food. Mighty forests that border wide rivers and lakes, swamps and morasses, where vegetation assumes a luxuriance unequalled beneath our northern sky, are their favourite haunts; and there, save when molested by man, the most formidable of their enemies, they lead a life of tranquillity and enjoyment. What, indeed, can be successfully opposed to the unwieldy strength of the elephant, rhinoceros, or hippopotamus, excepting the artifice and weapons which reason teaches man to employ, and which render the human race supreme over the mightiest of the brute creation?

\* From *Παχυς*, thick, and *Δέρμα*, skin.



Amongst the *pachydermata* the genus *rhinoceros* holds a conspicuous place: the animals of this genus, though inferior in size to the elephant, astonish by their massive and clumsy figure, and by the tremendous strength displayed when their energies are roused by aggression. Till very lately, the appearance of a living rhinoceros in our island has so rarely occurred, that few have been able to form a correct idea of its extraordinary conformation, which, independent of the novelty of the spectacle, is replete with interest. Since the year 1834, however, when the Zoological Society of London became possessed of the Indian rhinoceros, which is one of the greatest treasures of their *vivarium*, four or five individuals have been imported, and are, we believe, at present in the country; but though the astonishment which the animal, from its novelty, at first excited may be somewhat abated, the interest which attaches to it as one of the most extraordinary of the larger quadrupeds tenanting our globe can never diminish. It may yield perhaps in this point to the elephant—the structural peculiarities of which are unique among extant mammalia; and it certainly does not excite that sort of interest which attaches to this latter animal from its docility and submission to man, of whom it has been the obedient servant from the earliest periods of antiquity.

The general contour and proportions of the rhinoceros have long been known; but the earlier figures of the animal are, to a certain extent, incorrect and exaggerated. Where living specimens are inaccessible, artists and naturalists are liable to mistakes which are too often perpetuated, and which indeed are not always easily eradicated. It was in the year 1513 that Albert Durer, the celebrated painter of Nuremberg, drew from life the figure of a rhinoceros, which was sent from India to Emmanuel,

king of Portugal, and for many years this figure served as a general copy: it is repeated in the work of Aldrovandus ('Aldrov. Bisulc.' 884), and in Jonston's 'Quadrupeds' (tab. 38). The folds of the skin are exaggerated, but much more the tubercles with which the hide is studded, these having the appearance of scales, or rather shells of considerable elevation. Errors of this kind, with which the best works on natural history formerly abounded, are now in little danger of being repeated: natural history has received a new impetus; and the encouragement of scientific pursuits, by the desire of all classes to become instructed, tends to the elucidation of truth.

In stimulating this desire, and, at the same time, in satisfying it, the establishment of a well-ordered menagerie by the Zoological Society, in which living specimens of the rarest and most curious animals may be inspected, has taken a leading part: on the other hand, that the newly-awakened thirst for knowledge re-acts beneficially upon scientific institutions may be inferred from the fact that the Zoological Society, with laudable zeal, and feeling assured of the interest which the accession of a living rhinoceros would excite, hesitated not to purchase their splendid specimen at the price of 1000 guineas. Hence the desire of the public to be instructed in natural history supplies the means for such instruction, and an inducement for the scientific man to exert his energies for the public good. There is an indissoluble connection between the desire of the many for instruction, and the ability of the few to instruct; and this connection is not likely, we think, to be dissolved by those who fancy that knowledge cannot at once be both popular and accurate. In this department of knowledge, at any rate, there was the least accuracy when there was the least general desire for instruction; and the errors of naturalists especially have ceased to be

multiplied as the objects of these errors have come more within the observation of general observers and inquirers.

The species of the genus *rhinoceros* are equally divided between India and Africa. Three belong to India and the islands of Java and Sumatra; and, of these three, two are furnished with only a single nasal horn; the Sumatran species having two—three belong to Africa, and these possess double nasal horns, one seated anterior to the other, the first being by far the most developed. There arises, however, notwithstanding the positive testimony of Bruce and Salt to the contrary, a question, founded on the authority of Burckhardt, as to the existence of a one-horned species in Abyssinia. Bruce gives a long account of a two-horned species; and Salt assures us that it resembles the Cape species, figured by Barrow; but, on the other hand, Burckhardt says that, in the neighbouring country, above Sennaar, it is the one-horned rhinoceros that is found, and that the negroes there give it the curious name of “the mother of the one horn.” According to Burckhardt, its northern boundary, like that of the elephant, is the range of mountains to the north of Abou Huaze, two days’ journey from Sennaar; these mountains advance close on the Nile, and intercept the passage along the banks of the river; neither elephant nor rhinoceros is found in its free state below this point of the Nile. The hide of this animal is manufactured into shields, which are sold at Sennaar, all along the Nile, and across the mountains as far as Kosseir and Kenne in Upper Egypt. The material of the horn is very dear, Burckhardt having seen four or five Spanish dollars paid for a piece four inches long and one inch thick.

It yet remains to be proved whether Burckhardt be correct or not: we are inclined to believe that he

is; for Pliny, in the 8th Book, says that at the triumphal games of Pompey was exhibited a one-horned rhinoceros, such as is usually seen. (*Isdem ludis et rhinoceros, unius in nare cornus, qualis sæpe visus.*) Augustus, in the celebration of his triumph over Cleopatra, gave both a rhinoceros and hippopotamus to be slain in the circus, and Dio Cassius indirectly states the rhinoceros to have been one-horned: *cornu autem ex ipso naso prominens habet.* Strabo describes a one-horned rhinoceros which he saw at Alexandria, and notices the folds of its skin: could this have been brought from India, or is it not more probable that it was procured in the interior of the country? The Romans, however, were well acquainted with the two-horned species of Africa. Pausanias describes a two-horned species under the title of "Æthiopian Bull." Two individuals of the same species appeared at Rome during the reign of the Emperor Domitian, on some of whose medals was impressed their figure. We hear of the exhibition of these animals under Antoninus, Heliogabalus, and Gordian III. Cosmas describes the two-horned species of Æthiopia, and states that its horns are moveable, which is a mistake.

Whatever opinion may be formed regarding the existence of a one-horned rhinoceros in Abyssinia, and the acquaintance of the ancients with it, it is very clear that the two-horned species of Æthiopia (whichever of the three species known at present it may prove) was an animal with which the ancient Romans were familiar, and which was frequently exhibited in their games. In modern time, on the contrary, the two-horned rhinoceros has never been brought to Europe, and indeed until lately the distinguishing characters of the animal were unknown. Hence the apparent obscurity of some of the epigrams of Martial, wherein the two horns are

noticed. Dr. Parsons was the first to point out and establish the specific distinctions between the Indian and the African rhinoceros. We must not omit, however, to observe that Kolbe, Flaccourt, and others, had always regarded the South African rhinoceros as having two horns; and that Colonel Gordon described the animal in detail, and that his description was inserted by Allamand in the 'Supplémens de Buffon.' Sparrman, the Swedish traveller, also described this animal, both in his 'Relation of his Travels,' and in the 'Memoirs of the Academy of Sweden, 1778.' The differences in the dental formula of the Indian and South African rhinoceros were further discussed by Camper, who proved that, as Sparrman had previously stated, the Cape rhinoceros has 28 molars, without incisors, and that Dr. Parsons was correct in describing the incisors of the Indian species as separated from the molars by an intervening space.

It is time, however, that we pass from these general observations to a more particular description of the species; and we shall begin by an account of those peculiar to India and its islands.

We have already stated that three species of rhinoceros are indigenous in this portion of the globe.—These are, 1st, the common one-horned, or Indian rhinoceros (*Rhinoceros Indicus*, G. Cuv. and Desm. *Rh. unicornis*, Linn.); 2ndly,—the Javanese Rhinoceros,—(*Rh. Javanicus*, G. Cuv. *Rh. Sondaicus*, Desm.); and 3rdly, the Sumatran two-horned rhinoceros (*Rh. Sumatranus*, Sir S. Raffles, *Rh. Sumatrensis*, G. Cuv.).

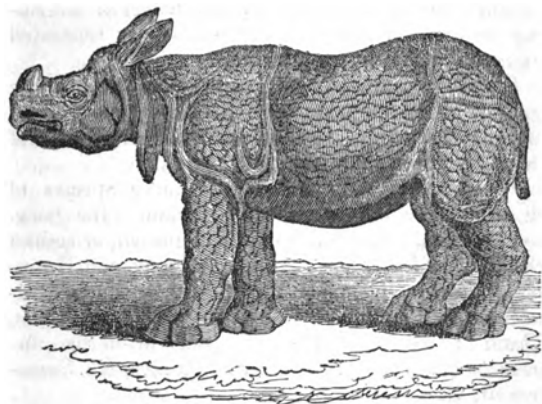
The common Indian rhinoceros is the only example of the genus which, in modern times, has been brought alive to the shores of Europe. The first instance on record has been already alluded to; viz., that of the one figured by Albert Durer: it was sent from India to Emmanuel, king of Portugal, A.D.



1513, by whom it was presented to the Pope; but the animal, being seized during its passage with a paroxysm of fury, caused the destruction of the vessel in which it was embarked.

In 1685, a second was exhibited in England;— and in 1739, a third was shown through most parts of Europe. From this specimen Dr. Parsons took his description and figure, published in the *Phil. Transactions*. In 1741, a fourth (a female) was exhibited, and is noticed also by Dr. Parsons. Cuvier regards this as identical with the individual exhibited in Paris in 1749, which was painted by Oudri, and afterwards figured by Edwards, in his *Gleanings*, in 1752. (See pl. ccxxi.)

In 1771 a young specimen arrived at Versailles,



*Young Indian Rhinoceros.*

and died in 1793, at the age of about 26. Buffon notices it in his *Supplement*, vol. iii.

In 1800 a young specimen died at London on its way to Germany, (being destined for the menagerie

of the Emperor,) and was dissected by Mr. Thomas, who published his observations in Phil. Trans.

Subsequently, in 1813 or 1814, we ourselves saw a specimen exhibited in England, which was taken to Paris in 1815, and described by M. Fred. Cuvier, in his work on the animals of the menagerie.

In May, 1834, the Zoological Society purchased their splendid specimen, and several individuals have been since imported.

The Indian rhinoceros is far more widely distributed than are its two immediate congeners: it is abundant in the forests and hills of the lower region of Nepal; and it inhabits the watered plains of India, Pegu, Siam and Cochin China, usually associating in small herds, which tenant the covert of dense jungles, or woods, remote from the habitations of men.

Clumsy, massive, and low on the limbs as it is, the rhinoceros is more prompt and rapid in its movements than its uncouth form would lead a person unacquainted with its habits to anticipate. In sluggishness of appearance it is indeed exceeded only by the hippopotamus. The body is protuberant, the belly almost touching the ground; the back falls from the withers and rises again on the crupper; the head is a ponderous mass, supported by a short and powerful neck; the shoulders are massive, and the limbs present the appearance of short stout pillars, for the superincumbent weight to be sustained. The feet are divided into three toes, encased each in a solid hoof. In its *tout ensemble* the rhinoceros reminds us of a huge hog, and its heavy movements contribute to strengthen the resemblance.

The peculiarities of form, however, which this animal displays require a more careful scrutiny. Elevated at the back part, or occiput, the profile of

the head sweeps downward with a decided hollow or concavity, which is at its *maximum* just above the eyes: it again rises over the nasal bones which support the horns, and terminates in a pendent but very flexible muzzle or upper lip. On each side of the occipital summit of the head are placed the ears, which are large, open, pointed, and very moveable; the animal freely turns them in every direction: its sense of hearing, as might be expected, is extremely acute. The eyes are very small, but bright, and prominent: their situation is remarkable; they seem as if placed rather on each side of the snout than in the ordinary position, being in fact nearer to the muzzle than in most animals, so that a slight turn of the head brings an ample circuit within their range of vision. Dr. Fordyce says that this position of the eye is for the purpose of rendering it "capable of performing the most essential of its functions, viz., that of examining the food necessary to its subsistence;" it is rather, we think, an adaptation to remedy the obstruction which the bulk of the body would oppose towards its range of survey, which, were the eyes placed high in the head, would be much more limited than is the case. The structure of the eye is not less remarkable than its position. Mr. Thomas informs us that, on dissecting the eye of the rhinoceros, he observed four processes of a muscular appearance arising by distinct tendons from the internal or posterior portion of the sclerotic coat, evidently intended to effect such changes in the axis of organ as to adapt it for distinct vision at different distances,—a provision in beautiful harmony with its peculiarity of situation.

But that which gives most character to the head of the rhinoceros is its horn, which, as we have said, is double in some species. This organ is of an elongated

recurvent conical figure, arising from a broad, limpet-shaped base, seated on the nasal bones, which are of a thickness and solidity not to be found in other races of quadrupeds. They form a vaulted roof, elevated in a remarkable degree above the intermaxillary bones, containing the incisor teeth, and their upper arched surface is rough with numerous irregularities and depressions; and here we may pause, to reflect on the advantages gained by their form and structure. They have not merely to sustain the weight of the horn, no trifle in itself, but to resist the shock occasioned by the violent blows which the animal gives with the weapon upon various occasions. Hence, conjoined with their solidity, that form is given to the nasal bones which, of all others, is best calculated for sustaining a superincumbent weight or sudden jars; while the rugosities and depressions tend to the firmer adhesion of the skin to which the horn is immediately attached. In the two-horned species, the posterior horn rests on the *os frontis*.\* When we speak of *horns*, our imagination pictures such as we are familiar with in the ox; but it must not be supposed that the nasal horn of the rhinoceros presents a similar structure. The horn of the ox consists of a bony core, or process from the skull, encased in a horny sheath. The nasal horn of the rhinoceros is a solid mass, structurally composed of agglutinated fibres, analogous to hair, and much resembling those into which *whalebone* is so easily separable. The horny sheath in the ox, goat, or antelope, is indeed also thus composed, but it covers, as we have said, a bony process from the skull itself. Here there is no bone, the whole mass being secreted, fibre by fibre, from the skin, to which it is firmly attached—

\* Geoffroy, 'Mémoires de la Société d'Histoire Naturelle de Paris.'

this being as firmly attached to the nasal bones, so that the horn is almost, if not quite, immoveable.\* The nostrils are longitudinal and somewhat S-shaped slits on each side of the upper lip. This, as we have said, hangs down over the under lip in the shape of a short pointed kind of proboscis, endowed with great flexibility, and capable of being used as an organ of prehension. The under lip is round and fleshy. The tongue is perfectly smooth, contrary to what is alleged by many of the older writers, who describe it to be so rough as to be capable of lacerating the skin. Marco Polo thus speaks of the tongue of the rhinoceros; and Bontius, a Dutch physician, who wrote on the productions of Java, in 1629, asserts the same. Others have repeated the error, which it has been reserved for naturalists of the present day to contradict. Sparrman, the Swedish traveller, observes, in his account of the African rhinoceros, that he thrust his hand into the mouth of one just shot, and found the tongue perfectly smooth and soft, contrary to the general opinion.

According to M. Cuvier the rhinoceros of Java has four incisor, and twenty-eight molar teeth; but it would seem that this does not include the small ex-

\* The following seems to be Mr. Burchell's theory respecting horns in general. He supposes that the pores of the skin secrete a *corneous matter*. When the pores are separate, they produce hairs. They have an insertion not deeper than the thickness of the skin, and their growth takes place by the addition of new matter at their base. When the pores are confluent, and in a line, they produce nails, claws, hoofs. When the pores are confluent, and in a ring, they furnish the corneous case of the horns of animals of the ruminating class; and when confluent, or in a circular area, they supply matter for the formation of solid horns, such as we see in the rhinoceros. It grows from the skin only, and in the same manner as the hair. It is not at all extraordinary that the rhinoceros should possess the power of moving its horn, although by no means so loose as some writers have supposed.

ternal incisors of the upper jaw, nor the intermediate ones of the lower, which had been lost in the specimen examined by M. Cuvier. The number also appears to vary in the different species. None of the species have canine teeth.

Of all the *Pachydermata*, the Indian rhinoceros is most distinguished for the density of the skin; nor does it lie smooth over the body, as in the African species, or the *hippopotamus*, but it is thrown into large folds, which add to the uncouth appearance of the animal, and form a sort of armour, very difficult to be pierced: hence it is manufactured into shields, and the like.\* The arrangement of the folds, or rather solid plates, with folded edges, is as follows:—Around the neck, which is short and deep, the skin forms two deep folds, of which the last hangs over the front of the chest. The shoulders are covered with a thick hard plate, falling in a fold over the top of the fore limbs, and separated also by a deep posterior fold from the plate covering the body. This is folded across the top of the crupper, the fold running down just before the haunch bones, and losing itself on the belly. The crupper-plate is divided by a longitudinal fold, running to the root of the tail on each side, from a large crural plate, which hangs in a deep fold over the thighs. Between the folds the skin is soft and flexible, and of a pale pink or flesh colour; but everywhere else it is hard and dense, and covered with tubercles or horny incrustations. Hence, were it not for these folds, the animal would be necessarily limited in his motions. In speaking of this subject, Dr. Parsons observes, that if the skin, thus hard and inflexible, were “continued all over the creature, as

\* Bishop Heber found the natives (at Baroda) making use of the hide for the purpose of defensive armour. One warrior had “a very large shield of transparent rhinoceros-hide, with silver studs.”

the skins of other animals, without any folds, he could not bend any way, nor perform any necessary action; but that suppleness in the skins of other quadrupeds, which renders them flexible in all parts, is very well compensated in this animal by those folds; for, since it was necessary his skin should be hard for his defence, it was a noble contrivance that his skin should be so soft and smooth underneath; that, when he bends himself any way, one part of his board-like skin should slip, or shove over the other, and that these several folds should be placed in such parts of his body as might facilitate the performance of every voluntary motion he might be disposed to."

On the ears there are a few stiff bristles, and similar bristles fringe the tail on each side at its tip. With these exceptions the skin is naked and of a dark greyish black, with a slight tinge of purple. Hard and dense as this integument is, it is nevertheless far from being destitute of sensibility; to the bites and stings of insects, which abound in the swampy places tenanted by the rhinoceros, the animal is perpetually subject, and it is by way of protection against these petty but multitudinous tormentors that he rolls in the slimy marsh, so as to cover the body with a layer of mud, which not only resists their attacks, but at the same time also defends the skin from the effects of a burning sun. Hence the partiality of the rhinoceros for localities which abound with water:—it is not however only in the mud-bath that the animal revels,—he delights in the water itself, and swims with ease and vigour. But, independent of the instinctive partiality which this animal manifests for the swamp, or border of the river, necessity restricts him to such localities: the quantity of vegetable aliment and of water he consumes is very great; and in such places, beneath

an Indian sky, nature provides him with a never-failing magazine of food. Suppose an animal, requiring for his daily support from sixty to seventy pounds' weight of vegetable matter, and fourteen or fifteen gallons of water, were placed in the midst of a scantily watered district, with a meagre crop of herbage, slowly renovated, and it needs no imagination to conceive the straits to which he would be soon reduced. Nature, however, in appointing every animal to a given locality, makes no such errors,—and in endowing the huge *Pachydermata* with instincts leading them to affect the water, she at the same time places the means of sustenance immediately within their attainment. Where they exist, there alone are they fitted to exist, and to that spot are they bound by instinct.

In a state of nature the rhinoceros leads a calm but indolent life:—sluggish in his habitual movements, he wanders along with a heavy measured step, carrying his huge head low, so that his nose almost touches the ground, and stopping at intervals to uproot with his horn some favourite vegetable, or in playful wantonness to plough up the ground, throwing the mud and stones behind him. As he passes through the tangled coverts every obstacle gives way before his irresistible strength, and his track is said to be often marked by a line of devastation in his rear. Inoffensive but fearless, the rhinoceros when roused is a most tremendous antagonist; and such is the keenness of his sense of smell and hearing, that, except by very cautiously approaching him against the direction of the wind, it is almost impossible to take him by surprise. On being thus disturbed he usually endeavours to make a peaceful retreat, but not always, and instances are on record in which he has at once advanced with fury to the attack. “A few years ago,” says the



translator of Cuvier's Animal Kingdom, "a party of Europeans, with their native attendants and elephants, when out on the dangerous sport of hunting these animals, met with a herd of seven of them, led as it appeared by one larger and stronger than the rest. When the large rhinoceros charged the hunters, the leading elephants, instead of using their tusks or weapons, which in ordinary cases they are ready enough to do, wheeled round and received the blow of the rhinoceros's horn upon the posteriors: the blow brought them immediately to the ground with their riders; and as soon as they had risen the brute was again ready and again brought them down; and in this manner did the contest continue until four out of the seven were killed, when the rest made good their retreat." We are not to infer from this account that there is any natural antipathy between the elephant and the rhinoceros, though Pliny asserts such to be the case, in which he is followed by the early writers. In the German inscription attached to the picture of the rhinoceros by Albert Durer of Nuremburg, which came into the possession of Sir Hans Sloane, (the translation of which is in the Phil. Trans. for 1744,) it is stated as follows:—"In the year 1513, upon the 1st day of May, there was brought to our king at Lisbon such a living beast, from the East Indies, that it is called *rhinocerate*: therefore on account of its wonderfulness I thought myself obliged to send you the representation of it. It hath the colour of a toad, and is covered over with thick scales. It is in size like an elephant, but lower, and is the *elephant's deadly enemy*: it hath on the forepart of its nose a strong sharp horn; and when this beast comes near the elephant to fight with him, he always first whets his horn upon the stones, and runs at the elephant with his head between his forelegs; then rips up the elephant,

and so gores him. The elephant is terribly afraid of the *rhinocerate*, for he gores him whenever he meets an elephant, for he is well armed and very nimble. This beast is called *rhinocero* in Greek and Latin, but in Indian *gomda*."

The fact is that there are seasons in which the rhinoceros becomes excessively furious; and upon any animal large enough to attract his notice, which intrudes within the precincts of his haunt, he rushes with impetuous violence. Between his mode of attack and that of the wild boar there is much similarity, save that the latter strikes with his tusks and the former with his horn; in each case the blows are directed more or less obliquely upwards, and repeated with great rapidity. The power and ferocity displayed by the rhinoceros when roused to the combat are very great; hence, as among the Romans, this animal is exhibited by the native princes of India in the barbarous sports of the arena, where it is opposed to the tiger or some other beast of prey: as may be expected, the rhinoceros is usually victorious, but provocation is needed to urge him to the attack, for he does not seek the contest, and only acts upon the defensive.

Captain Mundy, the author of a recent and very amusing work, in giving an account of the wild beast fights at Lucknow, in the king of Oude's park, thus describes the introduction and behaviour of a rhinoceros, which was probably one of the five or six large animals of that species seen at the same court by Bishop Heber:—

"A rhinoceros was next let loose in the open court-yard, and the attendants attempted to induce him to pick a quarrel with a tiger who was chained to a ring. The rhinoceros appeared, however, to consider a fettered foe as quite beneath his enmity; and having once approached the tiger and quietly

surveyed him as he writhed and growled, expecting the attack, turned suddenly round, and trotted awkwardly off to the yard-gate, where he capsized a palankeen which was carrying away a lady fatigued with the sight of these unfeminine sports.”\*

In an abstract of a paper on the Mammalia of Nepâl, by Mr. Hodgson, published in the Proceedings of the Zoological Society of London, for 1834, p. 96, we are informed that the rhinoceros is abundant (as is the elephant also) “in the forest and hills of the lower region, whence in the rainy season they issue into the cultivated parts of the Tarâi to feed upon the rice crops.” “The rhinoceros goes with young from 17 to 18 months, and produces one at a birth. At birth it measures three feet four inches in length, and two feet in height. An individual, born at Katmandoo eight years since, measures now nine feet three inches in length, four feet ten inches in height at the shoulders; the utmost girth of his body is ten feet five inches, the length of the head two feet four inches, of the horn five inches; he is evidently far from being adult. It is believed that the animal lives for 100 years: one taken mature was kept at Katmandoo for 35 years without exhibiting any symptoms of approaching decline. The young continues to suck for nearly two years. It has when born, and for a month afterwards, a pink suffusion over the dark colour proper to the mature hide.”

It is generally admitted by the ablest commentators that the unicorn or reem of Scripture is the rhinoceros, and though this opinion be not absolutely proved, it is at all events probable. The circumstance of a *one-horned* animal being intended need not startle us when we recollect the

\* ‘Pen and Pencil Sketches,’ being the Journal of a Tour in India.

description of a one-horned species by Strabo which he saw at Alexandria, and the notice of Pliny and Dio Cassius, to say nothing of Burckhardt's testimony to the existence of such an animal in the country above Sennaar. We here also observe that though Bruce describes and figures (we may say distorts) a two-horned species in Abyssinia,\* yet he says, "It is certain that the one-horned rhinoceros is found towards Cape Gardafui by the Straits of Babelmandel, and, if the natives are to be believed, the one-horned is also found in the kingdom of Adel."—*Bruce*, v. p. 85.†

However this may be, the picture drawn in the book of Job is very striking: "Canst thou bind the unicorn with his band in the furrow?—or will he harrow the valleys after thee? wilt thou trust him because his strength is great? or wilt thou leave thy labour to him." We have here vast powers, stubbornness, and indolence, depicted as forming the characteristics of a one-horned beast, with which we may suppose the writer to have been acquainted. But there is a curious coincidence between a passage in the Psalms and a popular belief in the virtues of the horn of the rhinoceros, which seems to have escaped observation: "My horn," says the Psalmist, "shalt thou exalt like the horn of a unicorn." The horn among the ancients was a symbol of power or high elevation: Jupiter Ammon is represented as having horns; and Michael Angelo, following up the idea, in his celebrated statue of Moses, sculptured the head as horned. But why is the expression, "like the horn of a unicorn," made

\* His figure appears to be a mere copy of Buffon's Indian rhinoceros, to which he has given a second horn.

† "At the royal stables at Ispahan there was a rhinoceros with one horn: it was brought for the king by an ambassador from Ethiopia."—Sir John Chardin's *Travels*.

use of? Not because the animal carries his head aloft, for the contrary is the case, but because (at least such is our impression) the horn of the rhinoceros was esteemed above all other horns: it was supposed to possess mysterious properties,—to be capable of curing diseases, and discovering the presence of poison; and in all countries where the rhinoceros exists, but especially in the East, such is still the opinion respecting it. In the details of the first voyage of the English to India, made in 1591, we find the rhinoceros designated as the *abath*, or *abadia*, and are informed that, between Malacca and Pegu, a trade was opened with the king of those parts for ambergris, and rhinoceros-horns, both which articles were monopolised by the sovereign, the latter probably on account of their imaginary virtues in detecting the presence of poisons.

Thunberg observes, in his 'Journey into Caffraria,' that "the horns of the rhinoceros were kept by some people both in town and country (Cape of Good Hope), not only as rarities, but also as useful in diseases and for the purpose of detecting poisons." As to the former of these intentions, the fine shavings were supposed to cure convulsions and spasms in children.

With respect to the latter, it was generally believed that goblets made of these horns would discover a poisonous draught that was put into them, by making the liquor ferment till it ran quite out of the goblet. "Such horns as were taken from a young rhinoceros calf that had not yet copulated were said to be the best, and the most to be depended upon. Of these, goblets are made which are set in gold and silver, and made presents of to kings, people of distinction, and particular friends, or else sold at a high price, sometimes at the rate of 50 rix-dollars a goblet. The horn is of a conical

form, thick at the bottom, and truncated at the top, a foot long frequently in old rhinoceroses, and is placed forward on their snout. Two or three inches from this, the African two-horned rhinoceros has another smaller and shorter horn: in colour it most resembles the horn of a bullock. When I tried these horns, both wrought and unwrought, both old and young horns, with several sorts of poison, weak as well as strong, I observed not the least motion or effervescence; but when a solution of corrosive sublimate, or other similar substance, was poured, into one of these horns, there arose only a few bubbles, produced by the air which had been inclosed in the pores of the horn, and which was now disengaged from it."—*Thunberg*.

Rankin, in his 'Wars and Sports,' observes that going through the sunderbunds of Bengal he fell in with a man who "possessed a small horn of a rhinoceros that had been killed in the woods, and this man (a Portuguese) had the same *universal* opinion of its virtues. On being asked how it ought to be used, he said that he put a small quantity of water in the concave part of the root, when held with the point downwards, and stirred the water with the point of an iron nail till it was discoloured, when the patient was to drink it."

The ivory of the elephant and the horns of the rhinoceros (animals which abound in the woods of Cochin China and are hunted by the natives) are a *royal monopoly*. "The horn of the rhinoceros," says an intelligent American officer, "is formed much like a limpet-shell, but more pointed: at its base it is generally about six inches long by four inches wide, and protrudes about six or eight inches. There is a shallow concavity, occupying the whole base, resembling the limpet also in that respect. To judge of the goodness of a rhinoceros' horn, this concave

part is put to the ear, and the greater the noise, resembling that of the waves on the sea-beach, the better the horn. This criterion certainly appears fallacious, if not ridiculous; but the Chinese, who are accustomed to purchase these articles, are always determined by this test."—See 'Voyage to Cochin China, in the years 1819-20, by John White, Lieut. in the U. S. Navy.'

Calmet, in his Dictionary of the Bible, published about 120 years since, observes that the horn of the rhinoceros is made use of by the Indian kings at table, because, as is believed, "it sweats at the approach of any kind of poison whatever."

It would not be difficult to muster a host of authorities on this point. Indeed most travellers who have visited the native regions of the rhinoceros have alluded to the great value set upon the horn from its imaginary virtues; and as no other horn has been or is now regarded in the same light, we are inclined to consider this horn of power and excellence, in which the poisoned draught of secret malice discovers itself, to be that to which the Psalmist alluded, and consequently that its bearer, the "unicorn," was the rhinoceros. In conjunction with these almost miraculous properties, the formidable nature of this horn as a weapon of defence, before which, used as the rhinoceros uses it, no enemy can stand, might also have been taken into the account.

Heavy and sluggish as is the rhinoceros, he is subject to sudden transports of ungovernable fury, during the continuance of which he rushes against every object in his way, striking with his horn, and throwing his whole power into every blow. We have already adverted to the instance of the individual sent by Emmanuel, king of Portugal, to the Pope, causing the destruction of the vessel in which it was embarked. M. Frederick Cuvier, in his de-

scription of the specimen exhibited in the menagerie at Paris, in 1815, notices these paroxysms of rage which caused no little anxiety on the part of his keepers. This description is in many respects so interesting that we shall not hesitate to present some portion of it to our readers :—

“ At the time the figure was taken of this rhinoceros,” he observes, “ the animal was but young ; and contrary to the received opinion, was of a very gentle disposition, obedient to his keeper, and receiving his care and attention with real affection. However, he would occasionally be seized with fits of fury, during which it was not prudent to come near him. No cause could be assigned for these violent paroxysms. One might say that a blind impulse or desire to gain a state of liberty (which he had never enjoyed) excited him to break his chains and escape from the bondage in which he was retained. Bread and fruits, however, always pacified him, and the claims of hunger always silenced those of liberty ; so that this resource against his fury was always kept in reserve. He knew those persons who most indulged him in his *gourmandise*, and they were received with the liveliest manifestations of affection : the moment he saw them he stretched towards them his long upper lip, opened his mouth, and drew in his tongue. The narrow stall in which he was confined did not allow him to manifest much intelligence ; and his keeper took no other pains than to induce him to forget or misconceive his own strength, and to obey ; but from the attention he paid to everything passing around him, and from the readiness with which he distinguished individuals, and recognised those circumstances which seemed preliminaries of his receiving something agreeable to him, one can readily judge that his intelligence would have acquired a greater development under favourable circumstances. But his immense force, and the apprehensions



constantly entertained that in one of his fits of passion he would break down his apartment, insured for him the most indulgent treatment: nothing was required of him without a reward; and the little degree of motion which was allowed him was an additional reason for requiring from him no other actions than to open his mouth, turn his head to the right or left, hold up his leg, &c.

“This animal was brought from India to England, from whence he was transported to Paris in 1815. He was thicker and still more unwieldy in his proportions than the elephant, although less in general size. His height at the highest part of the back was five feet six inches, and his length nearly eight feet: his head measured two feet, including the ears. The whole body was covered with a thick tubercular and almost naked skin, with a number of deep folds almost too irregular to be described. It was of a deep violet grey colour which seemed almost black when oiled or greased; and this kind of lubrication was performed twice or thrice a-week to prevent the skin from drying and cracking. Beneath the folds the integument was of a flesh colour, and much softer than at the other parts. In certain places, as the outer side of the limbs, the knees, and on the head, the tubercles of the skin had acquired such a length as to resemble horny threads closely arranged in a parallel manner one against the other, and it is these papillæ which some authors have termed excrescences. The few hairs that are observable are chiefly situated on the tail and ears, and are stiff, thick, and smooth. The tail was habitually pendent, but was susceptible of voluntary movements to the right and left, and the animal made use of it to drive off from the skin whatever annoyed him.” Alluding to the organs of the senses, F. Cuvier observes, respecting that of touch, that it is confined to the upper lip, adding that all the other

senses appeared to be tolerably acute. "He frequently made use of that of smell, and preferred sugared fruits, and sugar itself, to every other aliment. He collected together the smaller morsels of food with his moveable upper lip to carry them to his mouth; and when he ate hay, he formed it with his upper lip into little bunches, which he afterwards introduced between his teeth by means of his tongue." Notwithstanding the occasional paroxysms of fury to which this rhinoceros was subject, his general docility and good temper impressed M. F. Cuvier with the idea of the capability of his being rendered perfectly tractable, and that such is possible we have sufficient testimony. The late Bishop Heber (while at Baroda) observes, "In passing through the city I saw two very fine hunting-tigers in silver chains; and a rhinoceros (the present of Lord Amherst to the Guicar), which is so tame as to be ridden by a mahout, quite as patiently as an elephant." Previously, however, he had seen tame rhinoceroses, and noted their tractable disposition:—"At Lucknow there were five or six large rhinoceroses, the first animals of the kind I ever saw, and of which I found that prints and drawings had given me a very imperfect conception. They are more bulky animals, and of a darker colour, than I had supposed, and the thickness of the folds of their impenetrable skin much surpasses all which I had expected. These at Lucknow are quiet and gentle animals, except that one of them has a feud with horses. They seem to propagate in captivity without reluctance; and, I should conceive, might be available to carry burdens as well as the elephant, except that, as their pace is still slower than his, their use could only be applicable to very great weights, and very gentle travelling. They have sometimes had howdahs on them, and were once

fastened in a carriage, but only as an experiment, which was never followed up."

The sluggishness of the rhinoceros, coujoined with his liability to sudden outbursts of rage, during which he would deal destruction around him, are circumstances which must ever militate against his being used as an ordinary beast of burden, even where he can be easily procured; for though more tractable than has been commonly imagined, his services would neither repay the expenses nor the risks attendant upon his keep.

We shall conclude our history of this species by presenting our readers with some details relative to the specimen now living in the menagerie of the Zoological Society of London, which may not be found altogether devoid of interest.

It was in the month of May, 1834, that the Zoological Society became possessed of the splendid Indian *rhinoceros* which may be regarded as one of the chief ornaments of their gardens, pre-eminently rich as they are in rare and valuable specimens. It was obtained by purchase from the captain of an East India vessel, for the sum, as we have mentioned, of 1000 guineas. The animal in question is a young male, between seven and eight years old, as it is asserted, and, of course, not yet arrived at its full dimensions. Its admeasurements, taken May 3rd, 1837, were as follow:—

	ft.	in.
Height at the centre of the back . . . . .	5	0
————— withers . . . . .	5	2½
————— haunches . . . . .	5	5½
Circumference of chest . . . . .	9	4
————— of middle of body . . . . .	11	2
Length of head . . . . .	3	1
From back of head to root of tail . . . . .	8	6
Length of tail . . . . .	2	4
Circumference of fore-foot . . . . .	3	0
————— of hind-foot . . . . .	2	10
Length of ear . . . . .	1	0½

On its first arrival at the Gardens, though in tolerable health, it was by no means in high condition, and was dull and languid, but did not appear to have suffered materially from the effects of its long voyage. When introduced into its new abode, it entered the den or apartment prepared for its reception with an air of quiet indifference, and seemed perfectly contented with its lot. Left to itself, it soon reposed its huge massive frame on the straw, and slept with great composure,—indeed the principal portion of every day was now passed in sleep, and it roused up only to take its food and satisfy its hunger. The food, however, was given in stated quantities and at due intervals, lest, after having been so long kept upon a spare diet, it should suffer from too sudden repletion. It was with this precaution in view that visitors were requested not to offer it any articles of food, as they do the elephants, the bears, and other animals.

In a short time the good effects of an unremitting system of care and judicious management were very evident: the animal began to improve—its health and strength returned, and it acquired, not only a marked increase of bulk, but a degree of liveliness scarcely to be expected in an animal of such a heavy and sluggish appearance. Its liveliness, it is true, did not display itself as in the light bounding deer or antelope, for the rhinoceros has pretensions neither to gracefulness nor activity, but in a manner very similar to what is exhibited by the hog, when, in the exuberance of his spirits, he runs with headlong precipitancy round the farm-yard, or the sty. Thus would the rhinoceros display his animation, and indulge in sudden fits of boisterous sportfulness; running round the den, ploughing up with his snout as he went the bed of straw which covered a great

portion of the floor, or striking with his horn (as yet short) the thick wooden lining of the walls.

The animal now also recognised its keeper, would rouse up at his voice, and playfully follow him as he passed backwards and forwards before the den, as if solicitous of food, or desirous of his notice. The diet consisted, as far as could be managed, of such articles as the animal had been accustomed to in India before it was taken on board—boiled rice and bran, carrots, lucerne, dried clover, hay, &c., being his staple food. Of water, which was given *ad libitum*, it drank large quantities. Water is indeed essential to the health of the rhinoceros, which, as we have said, in a state of nature, frequents the luxuriant borders of rivers or marshes.

As the summer advanced, and the days began to be warm, the animal was admitted, from time to time, into the *Elephant's Paddock* (as the railed plot of ground is termed in which the large bath is constructed), for the purpose of enjoying a plunge into the water, both a luxury to the animal, and essential to its health. Here he was perfectly at home; and it was a novel and interesting sight to watch his gambols. Now he would run to and fro, ploughing the mud with his snout; now he would plunge into the bath, run out, and again plunge in, where he would often long remain almost wholly immersed, enjoying the grateful refreshment of his congenial element. But on these occasions another delight was to roll and wallow in the mud, a habit common to the hog, the elephant, and indeed most of the *pachydermata*. Thick as the skins of these animals are, and of the rhinoceros in particular, they are nevertheless peculiarly sensitive. The annoyance of flies and other insects they feel acutely. Their skins (especially of the elephant, rhinoceros, &c.) are al-

most destitute of hair, which in most mammalia constitutes an effective protection. Hence may we conclude that it is in order to protect themselves from their hosts of puny tormentors that instinct has taught these animals to cover their hides with a layer of slimy mud. At all events it is a habit which the rhinoceros eminently displays, and which is most certainly attended with feelings of comfort and satisfaction. Basking in the sun with his huge frame lolling on the margin of his bath, where the clayey soil was trampled into mud by the elephant's feet and his own; now rolling his little eyes around, as if to take a survey of all about him; now closing them in tranquil slumber, he would present a picture of thorough epicurean enjoyment. To conduct the rhinoceros from his den to the paddock was a work of no difficulty, and he would quietly suffer himself to be driven along the railed-in road to it, but it was another affair to get him back again. He would not, in general, leave the water or his muddy resting-place without reluctance, and it would require no little management to get him into the passage to his apartment: not that he would offer any violent resistance, but he would avoid, as long as possible, all efforts to entrap him between the railings, and at last proceed reluctantly. The quietness of his temper is, however, not a little remarkable; hitherto he has exhibited no paroxysms of rage or fury, as the animal shown in Paris is reported to have done, but is inoffensive, happy, and contented. He neither pines nor evinces impatience in his captivity. To eat and drink and sleep, to roll in the mud, or luxuriate in his bath on a fine sunny day, constitute the sum total of his felicity.

We may here remark that the individual at Paris was confined in a narrow stall, which allowed him but a small degree of motion, from a fear lest he

should break through the bars of his prison. We can easily conceive how such cruel confinement, which barely allowed the creature the liberty of turning his head, would produce paroxysms of rage and impatience, and the most violent struggles for extrication from so irksome a condition. Nothing but an immediate and abundant supply of the food most agreeable to him pacified him in his fits of fury. In the present instance, the animal has a large apartment to himself, with a railed yard attached to it, so that he has plenty of room for exercise, and can scarcely be said to feel the irksomeness of confinement.

Of late, in consequence of some alterations in the paddock, the rhinoceros has been restricted to his own apartment and the inclosed space before it; and here he may be often seen, exhibiting in uncouth gambols an extraordinary spectacle of unwieldy strength exerted in the ebullitions of sportiveness. On one of these occasions, indeed, it managed, by repeated blows with its horn, to break some of the thick boards which line the walls of its den, and would have proceeded with its work of demolition if it had not been timely interrupted. On another occasion, in a fit of exuberant mirth, it put its keeper, who happened to be in the den at the time, into considerable jeopardy, and had nearly squeezed him to death in its unwieldy play. Thrusting at him with its horn, it followed up a regular attack, and at length fairly pinned him in a corner against the wall, driving its horn forcibly against his chest. From this perilous situation he was extricated by the other keepers, whom his calls for assistance led to the spot. It was some time, however, before he recovered from the effects of the bruises received in the unequal struggle.

The ordinary pace of this animal consists in a

slow, sluggish walk, but during its fits of animation its progress is rapid,—its pace being a heavy lumbering gallop, with the head carried low, so that the nose almost touches the ground. In a state of nature the rhinoceros thus rushes headlong upon its antagonist, striking an upward blow with its formidable weapon. Its play may, therefore, be regarded as a mimic representation of its mode of combat.

Our observations of the individual in the gardens of the Zoological Society confirm the accounts which travellers have given of the acuteness of its senses, and more particularly of those of hearing and of smell. The ears are very moveable, and the animal may be observed turning them almost constantly in different directions, as if intent to catch the various sounds around him. Though visitors are not permitted to feed him, he scents the buns or bread they may have in their hands for the supply of the elephant, and will approach the bars to solicit a share, which he does very expressively, gazing intently at them, and at the same time stretching out the upper lip, which is capable of being protruded to a remarkable distance, so as to form a sort of proboscis. While the keeper bringing his meal to him is yet at a distance, he is instantly aware of his approach, and testifies unequivocal signs of satisfaction. His voice is a short inward grunt, uttered occasionally, and especially when about to feed or take his rest. In his moments of excitement, however, he frequently utters a neighing sort of sound, which though not very loud is shrill and piercing.

We have alluded to the power of protrusion possessed by the upper lip of this animal, which constitutes it a rudimentary proboscis. In the elephant the development of the upper lip into a proboscis is



carried to its highest degree of perfection, but we are not to suppose that this structural peculiarity is exclusively limited to the elephant, for we recognise it in the tapirs, both of the Old and New World. In these animals the proboscis is short: still, however, they are capable of twining it round branches, or of holding objects in its grasp, and they use it in the procuring of their food. In the rhinoceros the development of the upper lip into a proboscis is far inferior to what we see in the tapir, yet, as we have often witnessed in the animal at the Gardens, it can hold objects with it, it can secure carrots and other things in its grasp, and direct them into the mouth, or double it round small bundles of hay or straw. When the creature begs for food between the bars of its stall, it may be observed to protrude its upper lip into a long, pointed, conical figure, and with this, doubling it round the object, it grasps whatever is offered for its reception. This, however, is an experiment visitors are not allowed to make, lest an indiscriminate supply of food should injure its health and appetite.

While alluding to the proboscis of the elephant, tapir, and rhinoceros, we may observe that something of this mobility of the upper lip is seen in the horse also, which uses this organ in gathering up his hay; but its power of protrusion and of grasping is inferior to what is possessed by the lip of the rhinoceros.

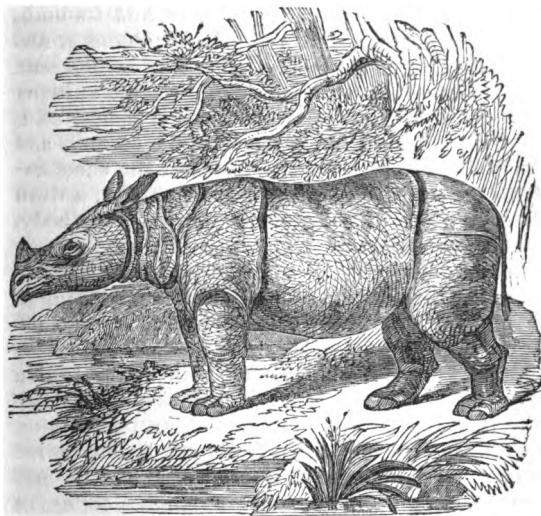
From the good condition in which the rhinoceros is at present, there is every probability that it will continue for many years a source of attraction and a theme of admiration in the Zoological Gardens.

We shall conclude by giving the following account of the daily *diet* of the animal as at present regulated:—

Clover-hay . . . . .	28
Meadow-hay . . . . .	28
Rice . . . . .	8
Potatoes . . . . .	5
Bran, three pecks	
Salt . . . . .	$\frac{1}{2}$

The salt is mixed with the boiled rice and bran.

Such is each day's consumption of solid food. Of water he takes daily fourteen gallons. He is generally lively in the afternoon and evening, and passes fourteen hours on the average out of the twenty-four in sleep and repose.



*Rhinoceros of Java.*—*Rhinoceros Sondaicus*, Cuv.; *Rh. Javanicus*, F. Cuv  
(From a plate in Dr. Horsfield's *Zoological Researches in Java*.)

The rhinoceros of Java was first suspected by Canper to be specifically distinct from the common

Indian rhinoceros, and the suspicions of Camper were subsequently converted into certainty by Baron Cuvier, from a rigid comparison of the entire skeletons of the two animals, and an examination of the skin, conjoined with a description of the living animal by MM. Diard and Duvaucel.

As far as is yet known, this species is limited to the island of Java, where it is termed warak : in the possession of incisor teeth, a single horn, and a folded skin, it agrees with the Indian rhinoceros, but differs from that animal in the character and situation of the folds, and in general inferiority of size. Its proportions are less massive, and its limbs longer in proportion, than in the *Rh. Indicus*, and the disposition of the folds of the skin is different. On the head they are wanting, the cuticle being rugous, and divided into small angular plates, as it is also on the body. A fold crosses the occiput, and a second stretching transversely across the shoulders extends on either side beneath the throat ; a third fold behind the shoulders almost encircles the body, a transverse fold exists above each fore-leg, a large fold crosses the crupper and descends on each side in front of the thighs, and a slight fold beginning at the root of the tail advances forwards upon each thigh.

These folds are all less deep than in the Indian species ; the surface of the skin is divided into small polygonous tubercles, with a slight central depression in each, from which arise a few short bristly hairs ; the ears are bordered with a series of long, stiff, and closely-arranged bristles, and a similar series of bristles extends along the under surface of the tail.

It is to Dr. Horsfield that we owe whatever knowledge we possess of the habits of the Javanese rhinoceros. Referring to the figure given of the animal in his 'Zool. Researches in Java,' this

clever naturalist states that the individual from which the drawing was taken was captured while very young in the forests of the province of Kedda, and was conveyed to the residency at Magellan in the year 1815 or 1816: "by kind treatment it soon became domesticated to such a degree, that it permitted itself to be carried in a large vehicle, resembling a cart, to the capital of Suracarta. I saw it during its conveyance, and found it perfectly mild and tractable. At Suracarta it was confined in the large area or square which bounds the entrance to the royal residence. A deep ditch about three feet wide limited its range, and for several years it never attempted to pass it. It was perfectly reconciled to its confinement, and never exhibited any symptoms of uneasiness or rage, although on its first arrival harassed in various ways by a large proportion of the inhabitants of a populous capital, whose curiosity induced them to inspect the stranger of the forest. Branches of trees, shrubs, and various twining plants were abundantly provided for its food: of these the species of *Cissus*, and the small twigs of a native fig-tree, were preferred. But plantains were the most favourite food; and the abundant manner in which it was supplied with these by the numerous visitors tended greatly to make the animal mild and sociable. It allowed itself to be handled and examined freely, and the more daring of the visitors sometimes mounted on its back. It required copious supplies of water, and, when not taking food or intentionally roused by the natives, it generally placed itself in the large excavations which its movements soon caused in the soft earth that covered the allotted space. The animal rapidly increased in size: in the year 1817, having been confined at Suracarta about nine or ten months, the dimensions were nine feet in length, and above four feet three inches in height

at the rump. In 1821 it had acquired the height of five feet seven inches.

“This information I received from my friend Mr. Stavers, who is now in England on a visit from the interior of Java; and he favoured me further with the following detail, which completes the history of the individual.

“Having considerably increased in size, the ditch of three feet in breadth was insufficient for confining it; but, leaving the enclosure, it frequently passed to the dwellings of the natives, destroying the plantations of fruit-trees and culinary vegetables which always surround them. It likewise terrified those natives that accidentally met with it, and who were unacquainted with its appearance and habits. But it showed no ill-natured disposition, and readily allowed itself to be driven back to the enclosure like a buffalo. The excessive excavations which it made by continually wallowing in the mire, and the accumulation of putrefying vegetable matter, in the process of time became offensive at the entrance of the palace, and its removal was ordered by the Emperor to a small village near the confines of the capital, where, in the year 1821, it was accidentally drowned in a rivulet.

“The rhinoceros lives *gregarious* in many parts of Java. It is not limited to a peculiar region or climate, but its range extends from the level of the ocean to the summit of mountains of considerable elevation. I noticed it at Tangung near the confines of the Southern Ocean, in the districts of the native princes, and on the summit of the high peaks of the Priangan Regencies; but it prefers high situations. It is not generally distributed, but is tolerably numerous in circumscribed spots distant from the dwellings of man, and covered with a profuse vegetation. On the whole, it is more abundant in

the western than on the eastern districts of the island. Its retreats are discovered by deeply excavated passages which it forms along the declivities of mountains and hills. I found these occasionally of great depth and extent. In its manners the rhinoceros of Java is comparatively mild. It is not unfrequently met in the wilds by Europeans and natives. No instance of its showing a disposition to make an attack has come to my knowledge: being the largest animal in Java, its passions are not roused, as in many parts of India, by contentions with the elephant. It is rarely seen in a domestic state, but is occasionally decoyed into pits and destroyed. Our animal rambles chiefly at night, and often occasions serious injury to the plantations of coffee and pepper which are laid out in the fertile districts selected for its retreats. The horns and skin are employed for medicinal purposes by the natives."

The rhinoceros of Java was known to Bontius, who wrote on the productions of that island in 1629. He falls, however, into the common error respecting the extreme roughness of the tongue. When exasperated, he says, "it will toss up a man and horse like a fly, whom it will kill by licking, while, by the roughness of its tongue, it lays bare the bones." Assertions such as this, which abound in the writings of the naturalists of the last two centuries, lead us to mistrust them throughout all their details.

Our third species of rhinoceros (*Rhinoceros Sumatranus*, Raffl.; *Rh. Sumatrensis*, Cuv.) is peculiar to the island of Sumatra, and was first definitely indicated by Charles Millar, (long resident at Sumatra,) in Pennant's Natural History; subsequently it was accurately described and figured by Dr. Bell in the Philosophical Transactions for 1793. The existence, however, of a rhinoceros in Sumatra was noticed by Marco Polo, who, speaking of this island,

says, "In this country are many wild elephants and rhinoceroses, which latter are much inferior in size to the elephant, but their feet are similar. Their hide resembles that of a buffalo. In the middle of the forehead they have a *single horn*; but with this weapon they do not injure those whom they attack, employing only for this purpose their tongue, which is armed with long sharp spines, and their knees or feet; their mode of assault being to trample upon the person, and then to lacerate him with the tongue. Their head is like that of a wild boar, and they carry it low towards the ground. They take delight in muddy pools, and are filthy in their habits." He adds that "they are very shy animals, and not to be decoyed by females, like the elephants."

It is evident from one great error that Marco Polo never saw the species in question; inasmuch as he attributes to it a *single horn*, whereas the horn is double. The account of the use made of the tongue as a weapon is founded on mere hearsay statement, commonly current when Marco Polo wrote. The only part of the description at all correct is that of the resemblance of the hide of the animal to that of a buffalo; but this seems merely accidental.

The Sumatran rhinoceros (*Rhinoceros Sumatranus*, Raffles), or "Badak"\* of the Malays, is intermediate in form between the Asiatic and the African species. With the former it agrees in dentition, with the latter in the number of the horns; whilst the skin, almost destitute of folds, is much softer and more hairy than in the Indian or Javanese animals. The figure of the animal already alluded to in the Philosophical Transactions is very correct; but that of the skull is erroneous in one particular. The intermaxillary

\* The Malay word "Badak" is evidently the origin of the terms Abadia and Abath applied to the rhinoceros of India by the early voyagers.

bone of the upper jaw is straight and horizontal, and not curved as there represented; and the incisor teeth, instead of being two, are really four, in each jaw, as in the *Rhinoceros Indicus*: but of these incisors, two in each jaw are very small, and soon fall out, and were therefore, it is most probable, wanting in the skull from which Dr. Bell took his drawing.

“The skin of the Sumatran rhinoceros,” says Sir T. S. Raffles, “is much softer and more flexible than that of the Indian one, and is not, like it, corrugated into plates of mail. It has however some doublings or folds, particularly round the neck, shoulders and haunches, rather more defined and distinct than in Dr. Bell’s drawing. The natives assert that a third horn is sometimes met with, and in one of the young specimens procured an indication of the kind was observed. The female has a larger and heavier head than the male, but is similar in other respects. They are not bold, and one of the largest size has been seen to run away from a single wild dog.

“The one-horned rhinoceros is not known to the natives of this part of Sumatra; and the single horns, which are occasionally procured, appear to be merely the larger horns of the two-horned species separated from the small one. There is however another animal in the forests of Sumatra never yet noticed, which in size and character nearly resembles the rhinoceros, and which is said to have a single horn. This animal is distinguished by having a narrow whitish belt encircling the body, and is known to the natives of the interior by the name of tennu. It has been seen at several places, and the descriptions given of it by people quite unconnected with each other coincide so nearly, that no doubt can be entertained of the existence of such an animal. It is said to



resemble in some particulars the buffalo, and in others the badak or rhinoceros." . . . . "It should be remarked that the native name tennu has until lately been understood to belong to the tapir. It is so applied at Malacca, and by some of the people at Bencoolen. In the interior, however, where the animals are best known, the white banded Rhinoceros is called tennu, and the tapir gindol, and by some babi alu. It is not impossible that, as both animals have white bands, the names may have been confounded by people little in the habit of seeing either, and deriving their information solely from report. In a country like Sumatra, where the inhabitants, in a great measure shut out from general communication, are divided into an infinity of tribes, speaking different dialects, a perfect consistency or uniformity of nomenclature cannot be expected, and it is not always easy to reconcile the synonymy." *Vide* Trans. Soc. Linn., vol. xiii.

The above account serves to prove that we have yet much to learn respecting the natural productions of this island, and of the larger islands of the Indian Archipelago; they present to the spirit of enterprise a wide field, rich in materials; but a thousand obstacles render the acquisition of these materials a work of time and labour. The tennu of the forests of Sumatra, however, we cannot help regarding as the tapir, notwithstanding the assertion of the natives that it possesses a horn: at the same time it is possible that the animal referred to in the above passage may be new, if indeed the accounts of the natives are worthy of credit, and thus prove a link in the chain of the *pachydermata*, elucidating points of great interest to the student of nature. But, until Sir T. S. Raffles obtained a vague account of it, Europeans had never previously dreamed of its existence: yet Europeans had resided in Sumatra long

before that eminent and excellent man, in whom the spirit of inquiry and enterprise was never dormant. Did all, with opportunities in their power, make use of those opportunities (whether limited or extensive) by adding to the stock of general information, how much would the progress of knowledge be accelerated!

Let us now pass to Africa, and examine into the habits, manners, and forms of the species inhabiting this vast portion of the globe, the interior of which is yet a *terra-incognita*, a region into which the most unsuccessful endeavours to penetrate have been productive of information. When we say therefore that three species of rhinoceros are indigenous in Africa, we do not assert that no other species exist there, but that we are only acquainted at present with this number; and indeed of these one is a very recent acquisition to science. Which of the three species is really the most abundant cannot easily be determined until we know much more of the interior than we do at present; but the species denominated *Rhinoceros bicornis*, Linn., *Rhinoceros Africanus*, Cuv., is that of which, through the writings of travellers, we have the fullest accounts, and which they themselves have most frequently met with.

The rhinoceroses of Africa have two nasal appendages, and the skin, though dense and coarse, is utterly destitute of folds: it is not however in these respects alone that the African and Indian species (setting aside the Sumatran species) differ, but also in the character of the dentition, a point of great importance.

The *molars* amount to twenty-eight in number, and there are no *incisors*, nor indeed is there any place for them, at the anterior part of the jaws. The intermaxillary bone is too small to contain them;

and in the lower jaw the space which they occupy in the Indian species is far too much encroached on by the molars for the possibility of their presence: in fact, the molars occupy nearly all the extent of the lower jaw, from the back part to the apex.



*Common African Rhinoceros.*—(From a specimen in the British Museum.)

The common African rhinoceros, *Rh. Africanus*, Cuv., possesses an extensive range of habitat, being spread over the whole of the southern regions of the continent of Africa, and extending, if the species be truly identical, into the central districts also. Huge, heavy, and massive in all its proportions, it prefers, like its Indian congener, the borders of marshes, lakes, or rivers, and delights to wallow in the mire. Its skin, destitute of folds, is

very thick, naked, and scabrous, and of an ashy brown; a few bristly hairs are seated along the edges of the ears and about the base of the horns. The height of a full-grown animal is from seven to eight feet, the length being from twelve to fourteen.

Of the senses of this animal those of hearing and smell are very acute, but that of sight seems, according to the general accounts of travellers, to be rather defective, more we suspect from the bulk of the body screening objects not immediately before him, than from any inferiority in the visual powers of the eyes themselves. It is true, indeed, that the rhinoceros, if circumstances prevent the animal from becoming aware by means of smell or hearing of the presence of the hunter, may be very closely approached, and that when attacked it rushes impetuously onwards, as if in either case it did not perceive its enemy. But, granting this, nothing is deduced from it excepting the caution of the hunter, and the difficulty the clumsy beast experiences in making a sudden turn in the midst of a headlong career, to which pain or fear instantaneously excite him. We know, however, that the rhinoceros can follow his object with great certainty, and that it requires much coolness and activity to avoid his charge. Burchell observes, respecting these animals, that "their smell is so keen and nice, that they know even at a great distance whether any man be coming towards them, and on the first suspicion of this take to flight. Therefore it is only by approaching them against the wind or from the leeward that the hunter can ever expect to get within musket-shot. Yet in doing this he must move silently and cautiously, so as not to make the least noise in the bushes as he passes through them, otherwise, their hearing is so exceedingly quick, that they would instantly take alarm and move far away to some

more undisturbed spot." To this he adds (proving that their sight is not *really* defective), "But the dangerous part of the business is, that when they are thus disturbed they sometimes become furious, and take it into their head to pursue their enemy; and then, if they once get sight of the hunter, it is impossible for him to escape, unless he possess a degree of coolness and presence of mind which in such a case is not always to be found. Yet, if he will wait quietly till the enraged animal make a run at him, and then spring suddenly on one side to let it pass, he may gain time enough for re-loading his gun before the rhinoceros gets sight of him again, which it fortunately does slowly and with difficulty."

Making allowance for the less degree of elevation presented by the occiput, the less depth of the concavity above the eyes, and the existence of two instead of a single nasal horn, the general description of the head of the Indian species will apply to this also; the position and smallness of the eyes, and the flexibility and power of protrusion enjoyed by the upper lip, are the same, and the tongue is also smooth. The nasal or apparently nasal situation of the eyes is noticed by Barrow. He says, "Not only the horns sit upon the nose, but the eyes are also placed in it, being directly under the root of the larger horn, and they are so minute that one would suppose them of little use to so large a creature. But nature, always provident, has remedied this inconvenience by placing them in projecting sockets, in which they turn in all directions like those of the little cameleon;" and he rightly concludes that a larger scope of vision is secured by their projection and forward situation than would otherwise have been enjoyed.

The Swedish traveller, Sparrman, one of the earliest and best of the writers on the productions of

South Africa, gives us some interesting details respecting this animal, the first specimens of which he procured between Boshman's river and Quammedacka, when a Hottentot in attendance shot two of them, each with a single ball that penetrated into the lungs. The smallest of these animals was seven feet high, eleven feet and a half long, and twelve feet in the girth. Its hide had, he observes, none of those plates and folds which we find in *drawings* and *descriptions* of the *Rhinoceros bicornis*, and which give it the appearance of being clad in armour; but it was an inch and a half thick, and still thicker, though less compact, on the sides. The surface of it was scabrous and knotty, and not much differing from that of the elephant, but of a closer texture, and extremely hard when dry. It was ash-coloured, excepting about the groin, where it was a great deal thinner, quite smooth and flesh-coloured.

In reference to the horns—the shape, relative size, and situation of which, together with their fibrous texture, Sparrman describes with great exactness—he promulgates a singular error, an error arising not from any oversight committed by himself, but from too implicit a trust in the assertions of the Hottentots. The first horn, as he rightly states, is always larger than the hinder one, which, especially in old rhinoceroses, is commonly much worn away. This latter circumstance he thinks goes to confirm the assertion of the Hottentots and colonists, that the animal uses his shorter horn only for digging up the roots which constitute its chief food, being endowed with the power of turning the larger horn aside out of the way. He was also informed, by the same authorities, that in the living animal the horns were so freely moveable, and indeed so loose, that as it walked carelessly along its horns might be seen to rock about,

and heard to clash and rattle against each other.\* A moment's consideration will suffice to show the utter fallacy of such statements: the horns, arising by a spreading base from the hard skin, may be said to be rooted in the bony structure, for the irregularities and depressions of the part below their base are such as to secure their firmest attachment; they are governed by no muscles—why should they be? nay, it is very plain that they cannot be: then how, even supposing that they were not so firmly attached to the bone as they really are, can they be moved about at pleasure? If Sparrman had tried, he would have found them firm as a rock. We have spoken with those who for years have been in the habit of seeing and hunting the rhinoceroses of South Africa, and we have made particular inquiries on this very point, with a view to test our own opinions by the practical observations of men well conversant with natural history, and close scrutinisers of the habits of animals in their native wilds: the reply has been, "The whole is a fable; the horns of the rhinoceros are fixed and firm." Of the power with which these weapons are wielded by their gigantic possessor, the following account by Bruce will convey a lively idea: "Besides the trees capable of most resistance, there are in the vast forests within the rains trees of a softer consistence, and of a very succulent quality, which seem to be destined for his principal food. For the purpose of gaining the higher branches of these, his upper lip is capable of being lengthened out, so as to increase his power of laying hold with this, in the same manner as the elephant does with his trunk. With this lip, and the assistance of his tongue, he pulls down the upper branches, which have most leaves, and these he devours first. Having stripped

\* Some modern travellers have made similar assertions.

the tree of its branches, he does not therefore abandon it, but placing his snout as low in the trunk as he finds his horns will enter, he rips up the body of the tree, and reduces it to so many thin pieces, like so many laths; and when he has thus prepared it he embraces as much of it as he can in his monstrous jaws, and twists it round with as much ease as an ox would do a root of celery, or any such potherb or garden-stuff." There is no doubt some degree of exaggeration in this description; but the violence with which the rhinoceros strikes with his horns the hardest bodies, or ploughs up the ground, throwing the clods and stones about him as he rushes along, is a sufficient evidence of their being fixed and solid. It is remarkable, however, that Salt, when travelling in Abyssinia, was assured of the mobility of the horns by several natives who had seen the animal alive. One of the Africans said that, "When feeding in the fields undisturbed, the horns are often depressed (which he showed with his hand on his head inclined in an angle of about  $45^{\circ}$ ); but when alarmed (raising his hand to a perpendicular over his head) the animal erects them thus." It is to be observed, however, that Mr. Salt never saw the rhinoceros alive himself, but he procured several sets of the horns, *which were fastened together by a portion of the skin, having no connexion whatever with the bone of the head.* We have already stated that the horns are secretions from the skin, and that they do not arise immediately from the skull; consequently they may be detached from the skull along with the skin by dint of force, but this is no argument in favour of the animal having the power of raising or depressing them at will, as has been too hastily presumed. To return to Sparrman. Referring to the two individuals killed, he states the shape of the horns to be



conical, with the tips inclining backwards, and notices their texture as consisting of parallel horny fibres; in their lower part they are rough and full of inequalities, but in the upper part they are plain and smooth, like those of oxen.

The anterior horn of the smaller of the two animals was a foot long and five inches in diameter at the base. The same horn on the larger animal was eighteen inches long and seven inches in diameter at the base. The feet do not project much in any part beyond the thick legs, and (as he correctly observes) they are divided into three hoofs, the central of which is the largest and most rounded. The soles of the feet, as in the elephant, are covered with a thicker and more callous skin than the other parts, and are somewhat of a circular form.

Mr. Sparrman chose the smaller of the two animals for dissection, an operation which, on account of the enormous weight of the beast and the toughness of its hide, was not performed without difficulty, and then only imperfectly. Taking the unwieldy beast as it lay, his assistants began their operations upon its left side, and removed a large slip of its thick skin, in doing which they were repeatedly obliged to sharpen their knives. They broke through the ribs with an axe, and by hacking and tearing contrived to empty the cavity of the abdomen. The naturalist made drawings, and took the necessary admeasurements of various parts, after which the diaphragm was removed, and then "a naked Hottentot crept into the carcase in order to pluck out the lungs and heart." Mr. Sparrman, from this rude and hasty examination, satisfied himself of the general resemblance between the visceral anatomy of the *Rhinoceros bicornis* and that of the *horse*: in both animals the gall-bladder is wanting (as it is in many others of the pachydermatous order, the tapir, byrax, &c.).

The tongue, instead of being rough and spiny, as asserted by Pliny, Marco Polo, and others, is perfectly soft and smooth. There are no incisor teeth, the pointed form and extreme hardness of the lips enabling the animal to clip the tops of plants and shrubs, however rough and prickly; for of such, with roots, small branches, and succulent plants, the stomach of the individual examined was filled.

The hide of the African species of rhinoceros, though thick and dense, is not thrown into heavy solid shields, as in the common Indian species, and would appear to be much more easily pierced; to this fact Sparrman adverts, and at the same time combats the notion, set forth by various writers on natural history, of its insensibility. He observes also that from the small size and position of its eyes the animal sees only straight forwards; "but to make up for this deficiency of sight its organs of smelling and hearing are so much the more acute: therefore at the least noise the creature takes the alarm, and, pricking up its ears, stands clapping with them and listening."

On returning on the 6th of February to the spot where the two rhinoceroses had been shot on the 19th of December preceding, Sparrman found that the greater part of these large animals had been eaten up or carried off by wild beasts and birds. The skulls were in good preservation, and, having taken possession of one of these, the naturalist and his companions were about returning to their waggon, when a female rhinoceros with her calf crossed their path. This calf was about the size of a small ox, but its horns were very small, and it seemed timidly to depend on the mother, whom it followed in all her motions. The noise of their horses betrayed them to the quick-eared animals, that stood still, list-

ening and moving about their ears, close to the entrance of a narrow hollow, through which they must pass to gain their waggon. In this dilemma Sparrman fired his gun, which was loaded with a ball made of lead and tin, but too small for the sport. It moreover hung fire for some time, and he only hit the mother on the lower jaw. On receiving the wound the animal swung about a little with the fore-part of her body, and snuffed up her nostrils, as if to scent her enemies. But they were to the leeward of her. She then, closely followed by her calf, moved forward with a slow and measured pace, as if to search a bush that lay between her and her assailants. The party, according to Sparrman's honest confession, were in a fright. A Hottentot, however, boldly kept his ground until the huge rhinoceros was close upon him, when he fired. The animals did not turn back, but ran forward with great impetuosity, and passed the travellers, apparently without seeing them. They did not, however, seem disposed to retreat from the field, for very shortly after Sparrman found them again facing him. "Indeed," says he, "I happened to discover them much sooner than I expected; and at the same time found they were nearer sighted than I could have ever supposed, as they stood about eighty or ninety paces from me on the open plain, without appearing to perceive either me or my horse, although they stood listening with their heads turned towards the place from which I advanced towards them." "After this," he continues, "dismounting from my horse, and walking on till I got within fifty or sixty paces of them, without anything to cover my approach, I fired at the old animal, which even now did not observe me, but, merely swinging the fore-part of her body from one side to the other with great impe-

tuosity, and at the same time blowing so hard and loud, that our horses, left to the care of an Hottentot, at several hundred paces off, were not a little terrified. After this, the two wild beasts ran away through the bushes, where it was both hazardous and difficult to pursue them. The Hottentots, who were better acquainted with this kind of chase, afterwards told us that it would have been much better for us had we fired at the calf, on which the small ball would have proved more effectual; in which case they supposed that the mother would have remained with the dead body till the next day, when they might have gone there and shot her also. In like manner they imagined that the calf would have remained with the body of the mother, in case she had been first killed."

When Sparrman reached his waggon he found that one of his Hottentot huntsmen, who had been in a different direction, had seen and wounded, but not *killed*, another rhinoceros that day. The breed, however, could not have been numerous in that part of Africa, even in his time, as Sparrman only saw eight rhinoceroses during all his journey. He gives a very amusing account of a hunt after one of these which passed within fifty paces of his waggon. His dogs boldly gave chase, and for some time were able to keep close to his heels, the pursuers contrasting singularly in size with the pursued, while the colossal animal on his part did not seem to take the smallest notice of them, but, with a trifling rise and fall of the neck, kept on an even and steady course, until he heard the report of fire-arms behind him, when he went off at a rapid pace.

In 1802 Lichtenstein found numbers of rhinoceroses near the Great Fish River and the coast, in a country overgrown with succulent plants. He was

informed that the animal was very dangerous to the traveller by night, when it rushes forward with blind fury at every noise of which it is informed by its acute hearing, and at every object betrayed to it by its more acute sense of smell. Examples were known of their having run in the dark against a waggon (in which vehicle, travellers in the interior of the Cape, where there are no habitations, pass the night), and not merely overturned it, but trampled it to pieces, and killed the oxen attached to it. As he descended this river towards its mouth, he found the country cleared of them and other large game, as a very grand hunting-match had recently been held there by a number of Dutch boors, who had coasted the stream almost down to the sea, and in going and coming, in twenty days, had killed five hippopotami, eight rhinoceroses, nine hartebeests, two wild boars, and five wild goats!

Continuing his journey, however, along the same river, the Doctor met a large rhinoceros, which was frightened away by the sight of his large party and by the cracking of the waggons' immense whips. Some hunters pursued it, but in vain. It ran with great swiftness, breaking down the bushes and underwood that opposed its progress with the greatest facility, and making way for itself where it was impossible for them or their horses to follow. This intelligent traveller agrees with Sparrman that the sight of the rhinoceros is defective, and that, with a little agility, its furious but stupid attack may be easily avoided. "The huge animal," he says, "always rushes straight forward, bending his head, closing his eyes, and pushing his horn along the ground. It is then easy to escape him, by stepping nimbly out of his way and letting him run onward; but attention should be paid to keep to the side

against the wind, so that he may not catch the scent. I have seen rhinoceros-hunters who have assured me that they have contended in this way with one of the monsters for four hours together, till his rage was at last quite spent, and he was easily killed.<sup>3</sup>

The commonest mode here, however, of killing rhinoceroses, was to watch them on a moonlight night to the spots where they went down to the river to drink, and there lie concealed among rocks or bushes until they came close to the muzzles of the guns. The part aimed at was about the eye.

In Burchell's travels, so valuable to the naturalist, as containing details of the habits of many interesting animals indigenous in the southern regions of Africa, we meet with a variety of facts relative to the rhinoceros, an abstract of which will not, we trust, be out of place or unacceptable. With regard to the senses of the rhinoceros, of which, as we have stated, those of smell and hearing are the most developed, a colonial Hottentot, named Speelman, well acquainted with the habits of the animal, confirmed the general observations of travellers. He stated as follows:—"Their smell is so keen and nice, that they know even at a great distance whether any man be coming towards them; and on the first suspicion of this take to flight. Therefore it is only by approaching them against the wind that the hunter can ever expect to get within musket-shot. Yet in doing this he must move silently and cautiously, so as not to make the least noise in the bushes as he passes through them; otherwise, their hearing is so exceedingly quick, that they would instantly take alarm, and move far away to some undisturbed spot." On one occasion Speelman, the above-mentioned Hottentot, happened to kill two rhinoceroses, of which one fell and remained in a position which

enabled Mr. Burchell to take accurate drawings of it. It sank in dying on its knees, and maintained "nearly the same attitude as when alive." "The first view of this beast," says Mr. Burchell, "suggested the idea of an enormous hog, to which, besides in its general form, it bears some outward resemblance in the shape of its skull, the smallness of its eyes, and the proportionate size of its ears; but in its shapeless, clumsy legs it more resembles the hippopotamus and elephant."

"The length of this animal was as follows:—Over the forehead, and along the back, from the extremity of the nose to the insertion of the tail, was eleven feet and two inches, but in a direct line not more than nine feet three inches. The tail, which at its extremity was complanated or flattened, vertically measured twenty inches; and the circumference of the largest parts eight feet and four inches." In this specimen, most probably young, there were on each side above five large molars and a small posterior one, making six; but in the lower jaw there were on each side six larger grinders and a small one at the back, making seven.

The flesh of the rhinoceros is by no means despicable as food. Sparrman observes that its flavour when broiled is not much unlike that of pork, in which he is supported by Bruce, who states that "the most delicate part about him is supposed to be the soles of his feet, which are soft, like those of a camel, and of a gristly substance. The rest of the flesh seems to resemble that of the hog, but much coarser." Mr. Burchell however says that its flesh is like beef. "The meat of the rhinoceros was excellent, and had much of the taste of beef;" that of an old one, however, he adds, "was somewhat tough, perhaps on account of having been just killed." A female, which was slain, "being fatter,

proved exceedingly well-tasted and wholesome. The tongue would have been pronounced a dainty treat even by an epicure."

From the same authority we learn that the Hottentot hunters adopt an ingenious mode of escaping from the attacks of this impetuous animal. They carry a sort of umbrella, made of ostrich-plumes, and this, when hard pressed and in imminent danger, they stick into the ground, and leave it to the fury of the enraged beast, which, imagining that its enemy is planted before it, makes the feather-stick (as it is called) the object of attack; the hunter in the mean time being enabled to effect his escape, or gain time for a second attempt.

We know not whether the African rhinoceros can be rendered as tame as its Indian relative, but we cannot doubt but that much may be accomplished, notwithstanding the furious temper and stupidity of the animal; not, however, by starvation and close confinement, but by a system of indulgence, mingled with a moderate degree of restraint, especially at first, so as to be as little irksome as may be. The indolence and want of intelligence which are said to be so characteristic of the animal are we suspect much overrated. It is true that the brain is small in proportion to the bulk of the body, being in volume truly stated "to be but one-third of that which usually belongs to an individual of the human species" (see Brewster's *Encycl.*, Art. *Mazology*), but so is that of the hog, the ox, the horse, and yet these animals are not indocile, nor is the hog, notwithstanding all that has been said, destitute of intelligence. It is astonishing how old errors pass from generation to generation, and how difficult it is to suppress them. The hyæna, for example, was but lately believed to be utterly untameable, and is so still by many, whereas nothing can be farther from the



truth: the rhinoceros has been regarded as utterly irreclaimable: we have seen, however, that the Indian species may be rendered tame and taught to carry burdens, and until the trial be fairly made, and found to fail, we have no reason to believe that the African animal is more indomitable. "A steady uniform fierceness in the brute creation," says Bruce, "is to be subdued by care and by hunger; this is not the case with the rhinoceros; his violent transports of fury upon being hungry, or not being served in the instant with food, seem to bar this manner of taming him. His revenge and fury are directed as much against himself as against an enemy; he knocks his head against the wall or the manger with a seeming intention to destroy himself." This blind fury is at least as characteristic of the Indian as the African species. Our readers will remember the fate of the individual sent by Emmanuel, king of Portugal, to the Pope, and also F. Cuvier's account of the paroxysms of frenzy to which the individual in the menagerie at Paris was subject: yet we know that this animal may be rendered quiet with comparative facility, as Bishop Heber testifies, and indeed as is proved by the specimen now living in the gardens of the Zoological Society of London.

Bruce gives many details concerning the rhinoceros in Abyssinia, but his figure of the animal is to all appearance that of the Indian species apparently copied from Buffon, to which is added a second horn on the nose; a circumstance which, notwithstanding all that he says, would lead us to suspect that he never saw, or at least closely saw, the animal. He states indeed, in the Appendix to his Travels, that the drawing which he made of the double-horned rhinoceros was the first that had been presented to the public, and that he had opportunities of seeing the animal in its native woods: if his drawing be faith-

ful, we have yet to become acquainted with the species, for it is not, as Salt affirms, identical with the *Rhinoceros bicornis* of South Africa. However this may be, we must leave to be determined hereafter.

Bruce regards the rhinoceros as identical with the reem of Scripture, a point to which we have previously adverted. He observes also, that though, considering his size and unwieldiness, the rhinoceros is rapid in his motions, it is not true that he is swifter than the horse, and that he has himself many times passed him with ease on horseback. Indeed the animal does not trust to speed for safety, but at once makes for the woods and thickets.

Among the natural tormentors of the rhinoceros, the flies are most annoying, and to him the most formidable: it would appear, however, fortunately for the animal, that they swarm only during the rainy seasons, when the soft parts of the earth in low situations become miry. The rhinoceros has then the opportunity of getting rid of his enemy. "In the night, when the fly is at rest, he chooses a convenient place, and, there rolling himself in the mud, he clothes himself with a kind of case which defends him against his adversary till the following day." As with the Indian species, rolling in the mire is not only a means of defence against the attacks of insects, but in itself a real luxury. While taking his mud-bath, Bruce says that "he grunts and groans so loud, that he is heard at a considerable distance," and that the enjoyment, combined with the darkness of the night, deprives him of his usual vigilance, so that the hunters, guided by the noise, steal secretly upon him. The Shangalla kill him with arrows, and these "the worst and most artificial that were ever used by any people practising that weapon."

The rhinoceros is hunted for the sake of its skin

and horns, which are valuable articles of trade throughout the country, Arabia, and indeed the East in general. The skins are made into shields, whips, &c., the horns into handles for swords and daggers.

The Abyssinians, who are familiar with the animal's stupid and unvaried mode of charging, and who are excellent horsemen, attack the rhinoceros on horseback and on an open plain without fear. As the rhinoceros rushes forward after the manner of the wild boar, the horse, which is well trained and in hand, is easily made to turn short aside and avoid the shock; on the instant a naked man drops from behind the hunter on the saddle, and, unperceived by the beast, which turns with difficulty, cuts at a blow with a sharp sword the tendon of the heel, so as to render the poor animal incapable of flight. The natives near the internal African lake, the great Tchad, are said to hunt the rhinoceros, which, as well as the hippopotamus, abounds in that district, in a still more fearless manner, following the animal on horseback into the swamps near the lake, much as they do the wild buffaloes.

The following is an account by Bruce of a rhinoceros-hunt in which he was engaged: it occurred near Tcherkin:—

“The next morning we were on horseback by the dawn of day in search of the rhinoceros, many of which we had heard make a very deep groan and cry: as the morning approached several of the Agageers then joined, and, after we had searched about an hour in the very thickest part of the wood, one of them rushed out with great violence, crossing the plain towards a wood of canes that was about two miles' distance; but, though he ran or rather trotted with surprising speed, considering his bulk, he was in a very little time transfixed with thirty or forty javelins, which so confounded him, that he left his purpose of

going to the wood, and ran into a deep hole, ditch, or ravine, a *cul de sac*, without outlet, breaking above a dozen of the javelins as he entered. Here we thought he was caught as in a trap, for he had scarce room to turn, when a servant who had a gun, standing directly over him, fired at his head, and the animal fell immediately to all appearance dead. All those on foot now jumped in with their knives to cut him up, and they had scarce begun when the animal recovered so far as to rise upon his knees: happy then the man who escaped first; and, had not one of the Agageers, who was himself engaged in the ravine, cut the sinew of the hind leg as he was retreating, there would have been a very sorrowful account of the foot-hunters that day.

“After having despatched him, I was curious to see what wound the shot had given which had operated so violently upon so large an animal, and I doubted not it was the brain; but it had struck him nowhere but upon the point of the foremost horn, of which it had carried off above an inch, and this occasioned a concussion which had stunned him for a minute till the bleeding had recovered him. I preserved the horn from curiosity, and have it now by me. I saw evidently the ball had touched no other part of the beast.”

Le Vaillant's narrative of a rhinoceros in South Africa, “an immense menagerie,” as he appropriately terms the country, may interest such of our readers as are actuated by the spirit of Nimrod, and long for mightier game to follow than hares or foxes.

“In the midst of this immense menagerie, the variety of which kept me in a continual state of enchantment, I was surprised not to find that prodigious number of rhinoceroses which had been mentioned to me by the people of Haripa's horde.

“One day however Klaas, who was always concerned in every matter of importance, and the first to communicate agreeable intelligence, came in great haste to my tent to inform me that he had observed at some distance from my camp two of these animals standing quietly close to each other in the middle of the plain, and that I had it in my power to enjoy the pleasure of the finest hunt I had ever yet experienced.

“The hunt indeed promised to be amusing, but, independently of danger, I foresaw that it was likely to be attended with difficulties. To attack two such formidable enemies it was necessary to use great precaution, and that we should approach them in such a manner as that they might neither see nor smell us, which is always very difficult. I at first proposed to form a ring which should surround them on all sides, and to advance upon them, gradually contracting the circle, so as to unite the moment we were about to commence our attack; but the savages assured me that with these animals this plan was impracticable. I gave myself up therefore entirely to their direction, and we set out armed alike with a good fusee and with the necessary courage. All my hunters wished to be of the party, and each proposed to display the greatest prowess. I caused two of my strongest dogs to be led in a leash, in order that they might be let loose on the rhinoceroses in case it should be found necessary. We were obliged to make a long circuit to gain the lea-side of them, lest they should smell us; and we reached the river, the course of which we followed under cover of the large trees that grew on its banks, when Klaas soon made us observe the two animals at about the distance of a quarter of a league in the plain. As one of them was much larger than the other, I supposed them to be a male and female.

Motionless by the side of each other, they were still in the same posture in which Klaas had first seen them, but they stood with their noses to the wind, and consequently presented to us their rumps.

“It is the custom of these animals when thus at rest to place themselves in the direction of the wind, in order that they may discover by their smell what enemies they have to dread. From time to time, however, they move their heads round to take a look behind them, and to be assured that they are safe on all sides; but it is only a look, and they soon return to their former position.

“We were already deliberating on the dispositions to be made for commencing the attack, and I was giving some orders to my company, when Jonker, one of my Hottentots, requested that I would permit him to attack the two animals alone as a *vekruyper*.

“My readers will here recollect that, when I foolishly attempted to cross the Elephant’s river, near its mouth, on the trunk of a tree, Jonker was one of the swimmers who saved my life, and that in return, at the desire of his companions, I raised him to the rank of hunter. At that time he was entirely a novice in this exercise, but I have already remarked that he afterwards became a most excellent shot, and surpassed all the rest of my hunters, particularly in the art of creeping. I have before observed that hunting in Africa has no resemblance to that in Europe; that to get within the reach of certain wild animals we must approach them without being perceived; and that it is impossible to get near them but by creeping on the belly. Those who have acquired this art are called *vekruypers*, and it was in this quality that Jonker asked leave to attack alone the two rhinoceroses, assuring me that he would acquit himself to my satisfaction.

“As his design would not prevent the execution of our plan, and as, in case his particular attack should not succeed, it would not impede our general one, I granted his request. He then stripped himself naked, and, taking his fusee, proceeded towards the animals, creeping on his belly like a serpent.

“In the mean time I pointed out to my hunters the different posts they were to occupy. They repaired to them by circuitous ways, each accompanied by two men. As for me, I remained on the spot where I was with two Hottentots, one of whom held my horse and the other my dogs; but, to avoid being seen, we posted ourselves behind a bush.

“In my hand I held a glass, which had often enabled me to see the operation of stage machinery and the effect of our theatrical decorations. How changed the scene! at this moment it brought before me two hideous monsters, which at times turned towards me their frightful heads. Their movements, which indicated fear and observation, soon became more frequent, and I was apprehensive they had heard the agitation of my dogs, who, having discovered them, made efforts to escape from the keeper, and rush upon them. Jonker still kept slowly advancing, but with his eyes fixed on the two animals. If he saw them turn their heads, he stopped, and remained motionless; one would have taken him for a large stone, and indeed in this respect I myself was deceived. He continued creeping with various interruptions for more than an hour. At length I saw him proceed towards a large bush of *euphorbia*, which was only 200 paces from the animals. Being certain when he reached it that he could conceal himself there without being seen, he rose up, and, casting his eyes everywhere around, to see whether his comrades had arrived at their

posts, he made preparations for firing. During the time he was creeping along I had followed him with my eye, and in proportion as he advanced I felt my heart beat with involuntary palpitation.

“ This palpitation, however, increased when I saw him so near the animals, and just upon the point of firing at one of them: what would I not have given at that moment to have been in the place of Jonker, or at least by his side, that I might have brought down also one of these savage monsters! I waited with the utmost impatience the report of the gun, and I could not conceive what prevented him from firing, but the Hottentot who stood near me, and who was able by the bare sight to distinguish him as perfectly as I could with my glass, informed me of his design. He told me that Jonker did not fire because he was waiting till one of the rhinoceroses should turn round, that he might if possible take aim at his head, and that on the first motion they made I should hear the report.

“ Presently, the largest of the two having looked behind, was immediately fired at; being wounded, he sent forth a horrid cry, and followed by the female, ran furiously towards the place where the noise had proceeded. I found my heart now agitated by the most violent emotion, and my fear was carried to its utmost extent. A cold sweat diffused itself over my whole body, and my heart beat with such force as to prevent me from breathing. I expected to see the two monsters tear up the bush, tread the unfortunate Jonker under their feet, and tear him to pieces; but he had thrown himself down with his belly on the ground, and this stratagem succeeded. They passed close by his side without perceiving him, and came straight towards me. My fear now gave place to joy, and I prepared to receive them; but my dogs,



animated by the report they had heard, became so restless on their approach, that, being unable to check them, I ordered them to be let loose, and encouraged them to the attack. When the animals saw this, they instantly turned aside, and proceeded towards another of the hunters placed in ambush, from whom they received a second fire, and then to another, from whom they received a third; my dogs, on the other hand, harassed them prodigiously, which still increased their rage; they kicked at them in the most terrible manner, ploughed up the plain with their horns; and, digging furrows in it seven or eight inches in depth, threw around them a shower of pebbles and stones.

“During this time we all kept approaching in order to surround them more closely, and to unite against them our forces. The multitude of enemies by which they found themselves enclosed rendered them completely furious. The male, however, suddenly stopped, and, turning round to attack the dogs, endeavoured to rip up their bellies with his horn, and while he was engaged in pursuing them the female quitted him and made her escape. I was highly pleased at her flight, which I considered a fortunate circumstance; for it is certain, notwithstanding our number and our arms, we should have been much embarrassed by two so formidable adversaries. I must even confess that without the assistance of my dogs we should not have been able to combat, but with great hazard and danger, the one that remained. The bloody traces which he left wherever he went announced that he had received more than one wound; but, reduced to despair, he only defended himself with the greater obstinacy.

“After a fruitless attack, which lasted for some time, he began to retreat, and seemed as if desirous

of gaining some bushes, apparently with a view of finding shelter, and to prevent his being harassed but in front. I guessed this stratagem, and, in order to disappoint him, I rushed towards the bushes, and made a sign to the two hunters who were nearest to me to advance there also. He was only thirty paces from us when we took possession of the post; accordingly, we all at the same time presented our pieces, and, discharging our three shots, he instantly fell, and was never after able to rise. I beheld his fall with the utmost satisfaction: as a hunter and a naturalist it afforded me a double triumph.

“Though mortally wounded, the animal still continued to defend himself when lying on the ground as he had done when on his legs; with his feet he threw around him heaps of stones, and neither we nor our dogs durst venture to approach him.

“I wished to put an end to his torment by firing one more ball, and was making preparations for the purpose, when my people entreated me to desist. As I could not ascribe their request to pity, I was at a loss to conceive what could be their motive. I have already said that all the savage tribes, and even the people at the Cape and in the colonies, set a high value on the dried blood of the rhinoceros, to which they ascribe great virtues. . . . The animal had lost a great deal by his wounds. It was with much regret that they saw the earth moistened with it around him, and they were apprehensive that a new wound would increase that loss.

“Scarcely had the animal breathed his last, when both old and new Hottentots all approached with eagerness in order to collect the blood. With that view they cut open its belly, and took out the bladder, which they emptied. One of them then applied the mouth of it to one of the wounds, while the rest shook

a leg of the animal to make the blood flow more readily. In a little time, to their great joy, the bladder was filled, and I am persuaded that with what was lost they might have filled twenty.

“I had approached the body also, but with a different design; for my intention was only to measure and examine it.

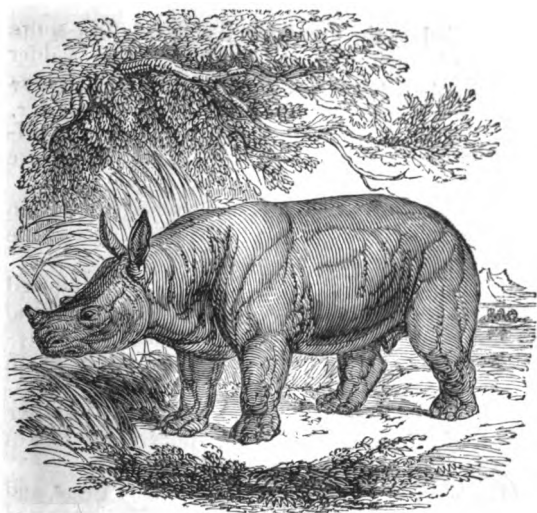
“The savages of the horde, accustomed to see such animals very often, assured me that it was one of the largest of its species.

“I however did not believe them, and what induced me to doubt their information was, that its principal horn was only (in French measure) nineteen inches three lines in length, and I had seen horns much longer, in the possession of some of the Dutch planters. The height of the animal was seven feet five inches; and its length, from the snout to the root of the tail, eleven feet six inches.”

The *Rhinoceros Africanus* feeds upon twigs and the shoots of trees or bushes, its flexible elongated upper lip serving as an organ of prehension.

It exhibits an aversion to fire, towards which it rushes with fury, so that it is not safe for parties or travellers passing the night around a fire in the districts frequented by it to go to rest, unless one of the number keep diligent watch, and arouse the slumberers on the first intimation of its approach. This precaution is indeed not always effectual. On one occasion a rhinoceros rushed with such rapidity on a military party, lodged among the bush covering the banks of the Great Fish river, that before the men could be aroused it had severely injured two of them, tossed about and broken several guns, and completely scattered the burning wood.

The second species of rhinoceros, namely, the white or blunt-nosed rhinoceros (*Rhinoceros simus*)

*Rhinoceros Simus.*

was first described by Mr. Burchell, and a head of one was brought over to England by the missionary, Mr. Campbell. The white rhinoceros is the largest of the African species, and seems to be distinguished by the truncate form of the snout, the upper lip being square instead of pointed. With this peculiarity of form is conjoined a difference in habits. Its food consists not of twigs and shoots, but of grass: hence it resorts to the open plains, (rather than to the woods,) where its favourite food is to be obtained. Another character consists in the smallness of the posterior horn, and in the great length of the anterior, which projects obliquely forwards, and is often three feet in length. Though of colossal magnitude, the white rhinoceros is more gentle and timid than are its other African relatives, and it is

not regarded by the natives with that fear which the other two inspire.

The third rhinoceros of South Africa (*Rhinoceros ketloa*) was lately made known to science by Dr.



*Rhinoceros Ketloa.*—(From Dr. Smith's specimen in the British Museum.)

Andrew Smith, who discovered it during the late expedition into the interior of the country, and brought a most magnificent specimen to Europe, which now graces the British Museum. In a catalogue of the objects procured by the party under the direction of Dr. Smith, in the districts to which they penetrated, the writer observes, "Previous to June, 1835, this species of rhinoceros was not known, no doubt from its never having approached the confines of the colony; though there is reason to

believe that individual specimens have occasionally travelled as far south as Lattakoo, the kind of horns peculiar to it having reached the Cape and England from that quarter. In that country however the occurrence of this animal must have been rare, as the natives there have no name for it; and, when questioned as to the number of species, never made mention of a third. This is the very opposite to what was experienced among the inhabitants of the countries in which it more commonly occurs, who when questioned on the subject invariably mentioned three by name, viz. *ketloa*, *boreli*, and *mohooloos*. Among those which are to be regarded as wanderers, the specimen in the present collection may be classed; it having been shot about 180 miles N.E. of Lattakoo, but considerably south of the country to which the species appears more directly to belong. It was upon that occasion that the expedition first became acquainted with the name of *ketloa*, which was only familiar even there to some few persons who had formerly resided more to the northward; but on the expedition penetrating to the northward of Lurrichane, every person was found conversant with the name, and able to direct to situations where the animal was to be found.

Few made mention of the *ketloa* without at the same time showing an inclination to observe upon its character; and those who had sufficient confidence in the party to venture a remark upon a native chief, then awfully oppressing that part of the country, spoke of the man and the animal as alike to be feared for their ferocity, and equally dangerous to the former inhabitants of that district.

In many points the rhinoceros *ketloa* bears considerable resemblance to the *Rhinoceros Africanus*: yet there are differences sufficiently palpable to enable even persons not very conversant in judging

of the fine shades of distinction between species readily to discover that it is distinct; such as the great length of the second horn, the more elongated and slender head, the form of the hunch on the shoulder, &c. Besides these differences, which are palpable to all, the naturalist is enabled to discover various others; the most important of which is the difference of dentition.

The form of the upper lip led those of the party who were acquainted with the *Rhinoceros Africanus* to infer that, like it, the present specimen must feed upon underwood; an inference which was completely justified by the statements of the natives when questioned upon the subject.

As the party advanced northward the ketloa became more common, though it never occurred in so great numbers as either of the other species; and it was only on one occasion that so many as seven were seen together, though the occurrence of such a number was by no means uncommon in the cases of the other two. From its having been considered of importance to ascertain the relative proportions of the three species, directions were given to the hunters to make a daily statement of the numbers they had seen of each; and it was thus found that only sixty-eight of the ketloa were seen in the course of the journey, a number far short of that of either of the others. The interest that the discovery of this new species excited led to the making of minute inquiries as to animals of this genus; and the expedition had sufficient reason to believe, from the replies to constant questions, that two other species existed farther in the interior, one of which was described as being somewhat like the ketloa, and having two horns, the other as differing in many respects, and having only one horn.

By way of comment on the three known African

species of rhinoceros, the clever writer of the catalogue observes, "The flesh of all the three species is esteemed wholesome food by the natives, who dig pit-falls for them in situations to which they are known to resort; and sometimes, though rarely with success, attempt even to kill them with the assagai or spear. In style of motion they are all alike, and so awkward, that their swiftness is to be appreciated, not by directly watching the animal itself, but by fixing the eye upon some two points between which it careers.

"The hide is generally about an inch thick, and so compact that a leaden ball will not pierce it: hence, to kill them, it has been found necessary to add to the lead a considerable proportion of tin. The hunter who would boast of killing one of these creatures at a single shot must hit it immediately behind the ear or the shoulder; and if this be not accomplished, and the sportsman be pursued by the enraged animal, which will often happen, then his best chance of escape is either to step aside suddenly from his course and pass behind a bush, or by a well-directed shot to break one of its legs.

"As they are animals which depend much upon smell for their existence and safety, it is necessary to advance upon them from the leeward side, if it be an object to get close without being discovered. In pursuit they also trust for guidance to the same sense, and they may be heard forcibly inspiring the air when they have lost the scent of the object they were following. The ticks and insects with which they are covered furnish for them another source of intelligence, inasmuch as they attract a number of birds, which sit quietly picking them off when nothing strange is in sight, but fly away when any object excites their fear. So well does the rhinoceros understand this, that he proceeds feeding with



the greatest confidence while the birds continue perched upon his back, but the moment they fly the huge animal raises his head, and turns it in all directions to catch the scent. Whether he accomplishes that or not, he generally feels so uncertain of his position that he moves to some other locality.

“The young animal shows all the ferocity of the adult, but the party inferred, from what took place after the capture of one of the second species, that this ferocity speedily succumbs to the power of hunger.\*

“When the animal in question was first procured, it butted violently at every one within his reach, though it was not much larger than a half-grown pig; but after being fastened up during the night it was on the following morning extremely mild, and quietly indicated its want of food. Subsequently it followed those who were in the habit of noticing it, and even showed signs of attachment to them; a remarkable change, as when first separated from its mother it was so savage that it actually butted for some minutes against a tree in which one of the hunters had sought shelter from the fury of the old animal.

“All the African species have two horns, for which the party could neither perceive nor hear of any other purpose than that of weapons of defence. It is true that they were sometimes seen to plough up the earth for several paces with the front horn, but with what object it was not possible to discover.

“The *Rhinoceros Africanus*, and the *Rhinoceros sinus* appeared to occur in nearly equal proportions; but the *rhinoceros ketloa* was much less common,

\* This is contrary to the experience we have had with specimens of the Indian rhinoceros in captivity in Europe, as previously noticed. When the animal is very young it may prove a successful mode of subjugation.

only sixty-eight individuals of that species having been seen by the expedition. Taking the three into consideration, it may, without exaggeration, be said that, in some situations well fitted for their residence, about one hundred or one hundred and fifty individuals were seen in the course of a day's journey."

Among the fossil relics of extinct animals, which at some former epoch have tenanted this globe, and, after a quiet possession (generation succeeding generation) of their pasture-lands, have passed away and become as it were blotted out of the book of nature, those of the rhinoceros are extremely abundant, little less so, indeed, than those of the mammoth or fossil elephant, and widely distributed. Occurring in the same strata, in the same localities, as those of the elephant, they have been more frequently overlooked, and less industriously collected. The teeth, as being most easily preserved in superficial situations, are the parts commonly met with; but as they are far inferior in size to the huge grinders of the elephant, and as the ponderous tusks of this latter animal have no parallel in the dentition of the rhinoceros, the attention of labouring men (and it is by such men that the discovery of fossil relics is mostly made) would be naturally absorbed in the contemplation of the more imposing objects revealed to their sight than of such as would seem comparatively insignificant; and it is thus perhaps that the reliquia of the rhinoceros, or rather of the various extinct species of the genus, appear less abundant than they are in reality. The first notice of the teeth of the fossil rhinoceros appears to be that of Dr. Grew, who gives the figure of a molar, simply describing it as the tooth of a terrestrial animal, whence it is evident that he was not aware of the animal to which it belonged. In another place, however, he speaks of a fragment of the lower jaw

of a rhinoceros, found near Canterbury, but without entering into any details; there, however, is little doubt but that he refers to one of the fragments discovered in the year 1668, in sinking a well at Chatham, at the depth of seventeen feet. Since that period fossil relics of the rhinoceros have been found in Germany, France, Italy, and Siberia, as well as in our own island, and that in considerable abundance, especially in Germany and Italy. It is, however, in Siberia that the astonishing discovery occurred of an entire animal still covered with skin. Pallas, who, in 1768, was appointed director of the museum of St. Petersburg, in which was then a vast collection of bones from Siberia, the result of researches made by order of Peter the Great (among which were four skulls of the rhinoceros), undertook himself to travel in the little-explored regions of that portion of the globe. In December, 1771, on the banks of Wiluji, which joins the Lena, he discovered below Jokoutsck (in  $64^{\circ}$  N. lat.) an entire rhinoceros with its skin, buried in the sand, and preserved by the cold. It was at the mouth of the Lena that the elephant with its flesh and skin entire was found imbedded in a block of ice, which, as it gradually melted, disclosed the stranger—the being of a prior epoch. From these and other circumstances it would seem that the borders of the Lena and its tributary streams are rich in the fossil *reliquia* of huge extinct *pachydermata*, and, among them, of those of the rhinoceros.

The remarkable discovery of Pallas, with the details respecting it, was published in commentaries of the Imperial Academy, vol. xvii., for 1773.

To enter into an account of the places and times in which the fossil bones of various species of rhinoceros have been found, and to record their first describers, would be irrelevant to our plan: we shall

therefore proceed at once to a brief account of the fossil species themselves as far as the discrimination of naturalists has enabled them to determine.

In the first place, then, we are presented with the *reliquia* of a huge species, distinguished by the division-plate of the nasal cavity being a solid bone instead of cartilage (gristle). To this species Cuvier has given the title of *Rhinoceros tichorhinus* (from *τοιχος*, a wall, and *ρην* nose). Of all the fossil species, it is of this that the relics have been longest known, and it was this that Pallas discovered on the banks of the Wiluji with its flesh and skin preserved. Happily, therefore, we know the form and true proportions of the living animal. The head was covered with unfolded skin, destitute of irregular callosities, in which respects, as well as in the presence of double horns, it agreed with the common two-horned rhinoceros of the Cape. The feet had three toes, as in all the extant species, but the hoofs were lost. Like the fossil elephant of Siberia, this animal was originally covered with hair: in many places this hair still remained, especially on the feet, where it was very abundant, measuring from one to three inches in length, of a stiff quality, and of a dusky grey. The head was invested in a similar clothing.

The skull of this species differs from that of the two-horned African rhinoceros, not only in the presence of the osseous nasal partition, but in general form and proportions. The length and narrowness of the skull are very remarkable, as is also the space between the orbits, which is much more contracted than in the common two-horned species, and the nasal bones are far more elongated. In the two-horned rhinoceros the disc which bears the anterior horn is a semi-sphere, in this an oblong ellipse, and a disc of similar figure supports the second horn,

whence it may be safely concluded that the horns of this fossil species were strongly compressed at the sides. The occipital ridge is elevated and drawn out backwards, so that from the highest point the occipital bone slopes at a very acute angle inwards to the condyles.

The most important character of this fossil rhinoceros, as Cuvier observes, "consists in the form of the nasal bones and in their junction with the intermaxillary. In this respect it differs not only from all other rhinoceroses, but also from all other known animals. The point of the nasal bones, instead of terminating unconnected with, and at a certain distance above, the intermaxillary bones, descends without becoming thinner before the nasal apertures, and there presenting three projecting tuberosities, then unites by a rather thinner portion to the intermaxillary bones at the part where they join together and where they form two tuberosities.

With respect to the dentition of this species, the number of molars is seven on each side above and below, as in the living species; but it yet remains a question whether incisors were present, as in the Indian species, or wanting, as in the African. Cuvier leaves the subject in abeyance, observing, "After many researches I dare almost affirm that the most common fossil rhinoceros wanted these teeth, as does the common two-horned rhinoceros of the Cape." Yet, as it regards the species with the bony partition of the nostrils, he adds that there is some degree of variation in the accounts given of it, but only as far as the dentition of the lower jaw is concerned. He states that in a fragment from Bologna he observed no trace of incisors, and he also notices the account of Pallas, who, in reference to the first skulls he discovered, writes (1769), "I was not a little surprised that in all the four skulls there was not the

least vestige at all of incisor teeth;" and four years afterwards (1773), speaking of the specimen found on the banks of the Wiluji, he still says, "The extremities of the jaws had no vestige either of teeth or of their *alveoli*."

A few pages afterwards, however, Pallas, speaking of a very perfect skull found on the borders of the Tchikoï, says, "At the apex of the lower jaw, or, as I may say, on its incisorial margin, though no teeth were present, there yet appeared four obliterated vestiges of minute equidistant alveoli, of which the two outer were the most obsolete, but the intermediate were tolerably denoted by very evident *fossæ*. In the upper jaw also of this cranium an osseous tuberosity existed at the anterior end of the palate, remarkable for an almost completely obliterated fossa, denoting the former existence of an alveolus."

"If," says Cuvier, "our figure 5 be well examined, it will be seen that the edges of the intermaxillary bones do not appear large enough to have contained teeth." Collini is of this opinion. "It does not seem to me," he says, "that incisor teeth could have existed at the anterior extremity of the jaw, for no space appears in which alveoli can be accommodated."

Cuvier sums up, however, by observing that, if, after all, this species had incisors, they were *very small*, and confined to the lower jaw;—and we may add, that it is not improbable that they disappeared when the animal became adult, for the cranium found on the borders of the Tchikoï was that of a young animal, in which only five molars on each side had made their appearance.

Besides this huge species with the osseous division of the nostrils and without incisors, at least in the upper jaw, there are at least three other species well determined: of these the first is that discovered in Italy; it is the *Rh. leptorhinus* of Cuvier, and had

two horns like the preceding species, but its nostrils were not divided by a bony partition, and the nasal bones were far more thin; the general proportions of the animal were also more slender, and its whole contour less cumbrous and massive; it appears to have resembled the common rhinoceros of Africa. Incisors wanting.

The next species is that of which Camper procured the teeth in Germany: it was of the ordinary stature of the living species, and characterised by the presence of incisor teeth, from which circumstance Cuvier has given it the name of *Rh. incisivus*.

The last species, the *Rh. minutus* of Cuvier, was at least two-thirds less than any living species. Its reliquia were found, mixed with the teeth of crocodiles and the bones of tortoises, as well as with the teeth and bones of a rhinoceros of ordinary size, at a village termed St. Laurent, near the town of Moissac, on sinking a well of considerable depth, in a bed of sand. To theorise upon the discovery of the fossil bones of extinct species, and to draw deductions from their existence in such or such strata, is the part of the geologist. Suffice it to observe, that we may not only reasonably expect that other species from the *regnum fossile* will yet be added to the list, but that the *reliquia* of intervening forms between the rhinoceros and others of the *pachydermatous order* will at no distant date reward the researches of science, and throw new light upon the multiplex chain of affinities, of which many links are yet to be discovered.