

CASSELL'S NATURAL HISTORY.

EDITED BY

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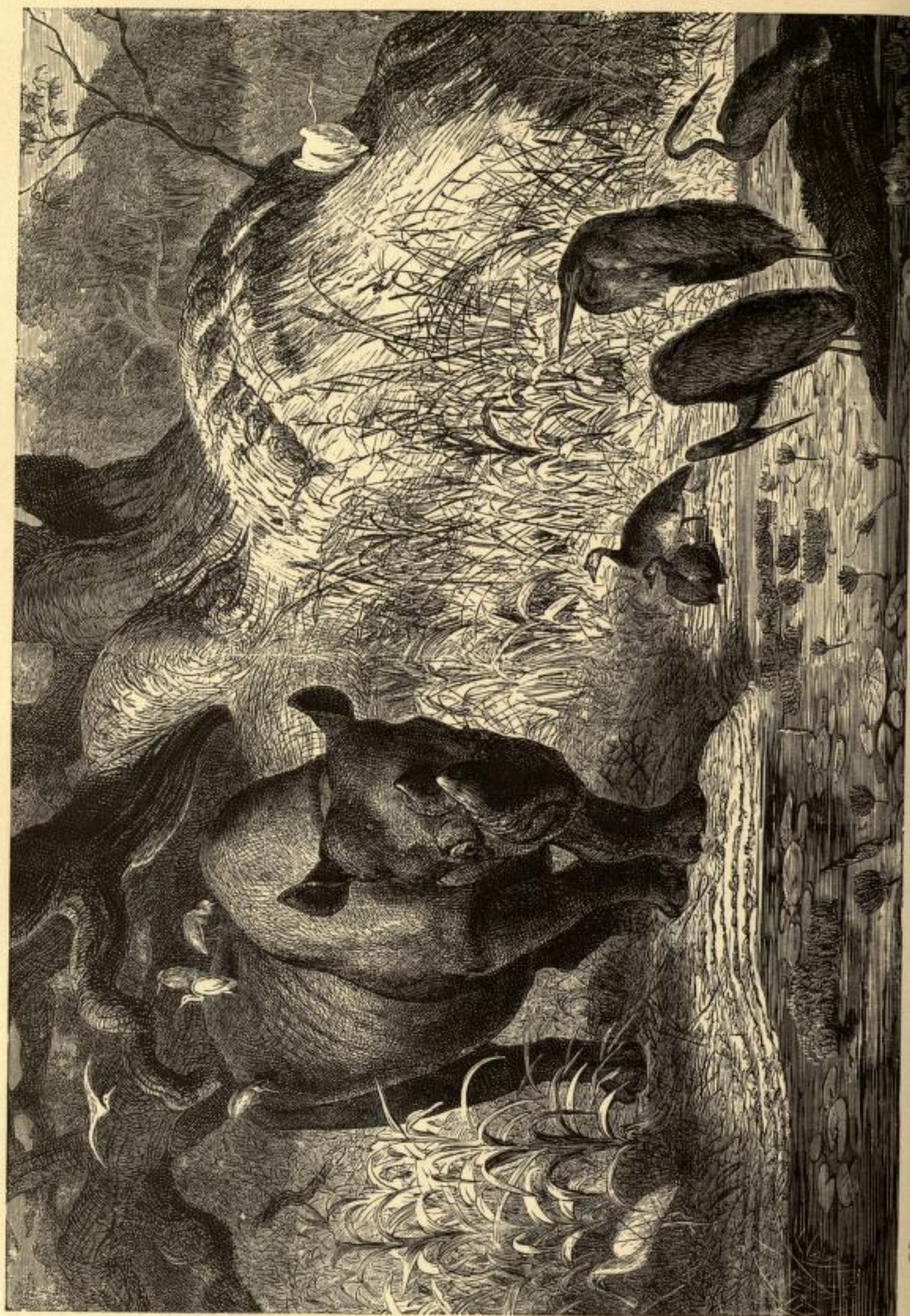
UNIV. OF
CALIFORNIA

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into the forests, but return again in the evening to the house in which they are kept and fed. The Tapir is capable of considerable attachment to its owner, and possibly, by care and attention, might be turned to good account, as the qualities with which it is credited—strength, docility, and patience—ought to render it capable of the duties of a beast of burden.

THE HAIRY TAPIR,* the second species of American Tapir, inhabits the inner range of the Cordilleras, this species being strictly mountainous in its habits.

It is stated to differ from the other species of America by not possessing a mane; but has altogether longer hair, and there are no wrinkles on the proboscis. In the conformation of the skull and general characteristics it more nearly resembles the Asiatic Tapir than the American, and is less common than the latter animal.

THE MALAYAN TAPIR.†—The Asiatic Tapir, which appears to have become known to Europeans only in the present century—at least, the first certain information of it reached Europe in the year 1816—is an inhabitant of Sumatra, Malacca, and the south-west provinces of China. It is said to have been found also in Borneo. In size it is larger than either *T. americanus* or *T. villosus*. It is distinguished by the absence of a mane, the general colour of the hair being glossy black, but with the back, rump, and sides of the belly white.

In its habits the Asiatic Tapir appears to be similar to his American cousin, and in captivity it is said to be of a most mild and inoffensive disposition, becoming as tractable and familiar as a Dog.

FOSSIL TAPIRS.—The living Tapir is known at the present day only in the warmer regions of the New and Old Worlds, in South America, and in the East. In the Pleistocene Age, however, it is proved to have ranged far up the valley of the Mississippi in the United States. In the Miocene and Pliocene Ages the animal inhabited Europe, and its fossil teeth are met with by no means unfrequently in the Crag deposits of Norfolk and Suffolk. The *Lophiodon* of the European and American Eocenes is also a closely allied form.

III.—THE RHINOCEROS FAMILY (RHINOCEROTIDÆ).

The Rhinoceroses form the third family of the sub-order of Perissodactyla. They are to be found in Africa south of the Sahara Desert, and in Eastern Asia—in India, Java, and Sumatra, &c., where the climate is tropical or sub-tropical. They are represented by several living species, as well as by several extinct forms which ranged, in the later Tertiary times, over nearly the whole of Europe and Northern Asia. The principal characters which are to be observed in the Rhinoceros are the large unwieldy bodies, supported on short, stout legs, terminating in a large callous pad with hoof-bearing toes, the large and long head, the small eyes and ears, and the short tail. All the living species also possess one or two horns, which are placed in the middle line of the head on and above the nose. The horns are to be viewed as a mere appendage to the skin, like hair, for they are only skin deep, and are composed of a series of fibres matted together, and are essentially a mass of hair in which each hair is confluent with those next to it. Horns were present also in all the fossil species excepting one, the *Aceratherium*, the hornless Rhinoceros of the Miocene Age. The skin in all the Rhinoceroses is very thick, and is converted into a jointed armour in some of the Asiatic species; it is also scantily covered with hair, except in “the Hairy-eared Rhinoceros.” A fossil kind was woolly.

It is a disputed point whether the word Reëm, mentioned several times in the Bible, and translated in the authorised version as Unicorn, is the Rhinoceros or the Urus; the probability seems to be that the latter is intended. The first time Reëm is mentioned in the Bible is in Numbers xxiii. verses 21, 22, to the following effect:—“The Lord his God is with him, and the shout of a king is among them. God brought them out of Egypt; he hath as it were the strength of Reëm.” Whatever animal Reëm may have been, it was a creature evidently of great power, and the strongest known to the prophet. In another passage—Deut. xxxiii. verses 16, 17—we obtain the information that Reëm was a two-horned and not a one-horned animal, and therefore could not possibly have been the Indian Rhinoceros at least, and that it is mentioned at the same time with Bullocks. Other passages speak

* *Tapirus villosus*.

† *Tapirus malayanus*.

of Reem in connection with the plough and harrow, for which its tameless and savage disposition rendered it unfit. It is also spoken of in Isaiah in connection with sacrifice: of cattle (chap. xxxix. verses 5, 7).

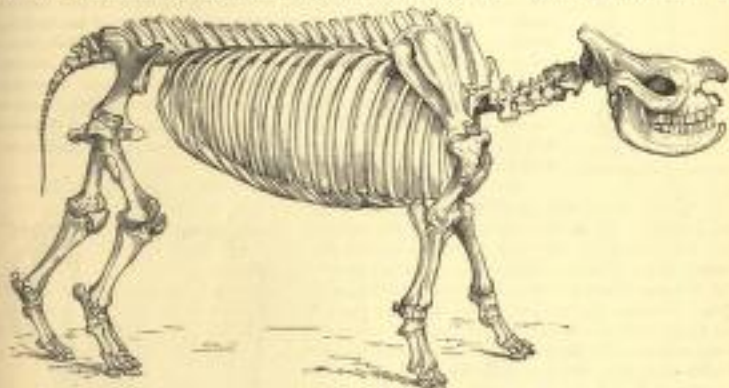
Topel, an author of the sixteenth century, while trying to show that there lived such a creature as the fabled Unicorn, and giving a picture representing it as possessing the horn of the Narwhal, the body of a Horse, and the feet of an Ox, successfully shows Reem to mean neither a Unicorn nor Rhinoceros, but simply an Ox. He relates:—"That there is such a beast the Scripture itself witnesseth, for David thus speaketh in the 22nd Psalm: *Et erigetur cornu meum tanquam unicornis*—that is, my horns shall be lifted up as the horns of a unicorn." He goes on to say:—"We have already shown, in the story of the Rhinoceros, that Reem in Hebrew signifies a Unicorn, although Munster be of another opinion; yet the Septuaginta, in the translation of Deut. xxxiii, do translate it a Unicorn, for the Rhinoceros hath not one horn but two. Rabbi Solomon, David Kimchi, and Saadiah do always take Reem and Karni for a Unicorn, and they derive Reem from Rom, which significth Affluence, height, because the horn of the Unicorn is lifted up upon high. Herunto the Arabians agree, which call it *Barkas*, and the Persians *Bark*; the Chaldeans, *Reemna*. In the 39th chapter of Job the Lord speaketh in this manner to Job:—'Will the Unicorn rest and serve thee, or tarry beside thy crèches? Canst thou bind the Unicorn with a halter to thy plough to make furrows? or will he make plaine the clefts of the valleys?' . . . Whereby God Himself must needs be traduced if there be no Unicorn in the world." We may therefore conclude that Reem was one of the Oxen wild in those times in Palestine. It, probably, was the great wild Ox, or Uru, which formerly abounded in the forests of Macedonia, and was hunted in the forests of Germany as late as the tenth century after Christ.

The Rhinoceros was first seen at Rome, according to Pliny, in the games given by Pompey to the Roman people. He describes it as being possessed of one horn on its nose, which it sharpens on a stone before it fights, and that when it fights with the Elephant it attempts to rip its belly open. The earliest time the animal was mentioned by name was by Agatharchides, who describes it as fighting in the manner above alluded to. In both these instances it is evident that the one-horned Asiatic species is meant. The African Rhinoceros, according to Dion Cassius, was for the first time brought before the notice of the Romans in a.d. 39, in the games given by Augustus to celebrate his victory over Cleopatra. It was exhibited along with a Hippopotamus, and both animals were in all likelihood obtained from the Upper Nile.

Probably the first Rhinoceros ever seen by modern Europeans was a one-horned species, the *R. unicornis*, sent from India to Emanuel, King of Portugal, in 1513. A sketch was sent from Lisbon to Nürnberg, and a most extraordinary engraving was made by Albert Dürer, from which Goussier, Topel, &c., took copies. This animal was made to appear in a wonderful suit of armour beautifully decorated, and supplied with a second horn on the shoulders, resembling the point of that of the Narwhal. Topel's description of the Rhinoceros is most ludicrous—"First of all, that there is such a beast in the world both Pliny, Solinus, Diodorus, Aelianus, Lampridius, and others, doe yield creffigible testimony." He then goes on to say:—"The picture here expressed was taken by Goussier from the beast alive at Lisbon, in Portugal. . . . Eucherius saith that the Rhinoceros hath two horns in his nose, but that is utterly false, as you may see by the picture. . . . The Rhinoceros cast up a Beare into the aire even as a Bull would do a bull which were laid upon his two horns; we shall not needs to apply *Gomina cornu* to the Bull, as Politianus doth, but rather take it figuratively for a strong horse, and if it must needs be littell, it is apparent by the picture that there is another little horse, not upon the nose, but upon the wither of the beast. . . . When they are to fight they whet their horns upon a stone; and there is not only a discord betwixt these beasts and Elephants for their food, but a naturall description and enmity: for it is confidently affirmed that when the Rhinoceros which was at Lisbon was brought into the presence of an Elephant, the Elephant ran away from him. . . . Hee (the Rhinoceros) is taken by the same means that the Unicorn is taken, for it is said by Albertus, Isidorus, and Alucenta, that above all other creatures they love virgins, and that unto them they will come, be they never so wilde, and fall asleep before them, so being asleep they are easily taken and carried away." Topel then goes on to inform us that "all the later physicians attribute the virtue of the Unicorn's horn to the Rhinoceros's

horn, but they are deceived by imitation of Isidorus and Albertus, for there is none of the ancient Grecians that have ever observed any medicines in the Rhinoceros. The Indians made bottles of their skins, wherein they put their lycion, or *sarcos modification*.*

The first Rhinoceros brought alive to England was in 1683, and another was shown throughout a great part of Europe in 1739, and another in 1741. Parsons[†] described and figured the Rhinoceros of 1739, and refers to that of 1741, which Cuvier says he believes to be the same animal afterwards shown in Paris in 1749, painted by Oudry, and afterwards engraved by Edwards and figured by Albinus. It was the one described by Daubenton, as well as by Meckel. The one of which Cuvier gives the osteology was the fifth brought to Europe. It arrived at Versailles in 1771, and died in 1793, at the age of about twenty-six years. Another Rhinoceros arrived from the East Indies in 1799, as a present to Mr. Dundas. This was afterwards purchased for £700, and exhibited at Exeter Change and also about England generally. Another animal, which was



SKELTON OF THE RHINOCEROS.

destined for the menagerie of the Emperor of Germany, arrived from India in 1800, but died in London soon after its arrival. It was dissected by Mr. Thomas, and his observations thereon were published in the "Philosophical Transactions." Shortly afterwards an eighth arrived, which subsequently went to Germany. Since this it has become common in the Zoological Gardens in various parts of Europe, and, in 1878, the genus was represented in the Regent's Park by no less than five different species and varieties.

The skeleton of the Rhinoceros, viewed generally, has a resemblance to that of the little Hyrax, the Tapir, and the Horse. The skull is much elevated at the base, being somewhat of a pyramidal form, and the nasal bones curve upwards and downwards, and are of such a size and thickness, in order to support one or more immense horns, that they are quite unparalleled for their development in any other existing quadruped. The nasal bones, together with the pre-maxillary and maxillary bones, form the general contour for the external apertures of the nostrils. This is peculiar, and found in no other animal, with the exception of the Tapir.

The Rhinoceros has no canine teeth; the incisor teeth vary, not only in regard to their form and proportions, but also their existence; and in the varieties of these teeth we may discern the same inverse relation to the development of the horns which is manifested by the canines of the Ruminants. Thus, the two-horned Rhinoceroses of Africa, which are remarkable for the great length of one or both of the nasal weapons, have no incisors in their adult dentition; neither had the great extinct hoary

* Philosophical Transactions, xli.

species (*Rhinoceros siseoides*), though that the latter had great horns is proved by the nature of the bones of the nose and face which supported their weight. The *Sumatran bicorn Rhinoceros* combines, with comparatively small horns, moderately developed incisors in both jaws.



FEMUR OF RHINOCEROS.

The sternum of the mature animal consists of four bones, the first of which is compressed into a ptephoid-like shape, and projects in a point in front of the first ribs. All the bones of the fore limbs of the *Rhinoceros* resemble those of the *Tapir* more than those of any other animal; but from their much larger size are not at all likely to be confounded with them. Of the hind limbs, the points offering peculiarities are as follows:—The femur is remarkable for being extremely flattened from before backwards, and the projection called by Cuvier the third trochanter projects very much, forming a hook ascending towards a hook which descends from the projection known as the grand trochanter, thereby leaving an oval hole between these two projections. With regard to the lower portions of the hind leg, resemblances are to be found both to the Horse and *Tapir*, the tibia, fibula, metatarsals are to be found both to the Horse and *Tapir*, the tibia, fibula, and tarsus being built on the same plan as those of the former, although some of the bones of the tarsus resemble those of the *Tapir* more than they do those of the Horse. There are also some points of resemblance in the metatarsus to that of both the Horse and *Tapir*. The difference between the hind legs of the *Rhinoceros* and Elephant is very marked, and their gait is different.

The dentition of the *Rhinoceros* differs in a very remarkable degree from that of the family of Horses. The grinders are implanted by distinct roots, and in the upper jaw their crowns are traversed by two deep folds of enamel, which constitute open valleys. In the lower jaw they are composed of two crescent-shaped lobes, also open. The covering of "enamel" is thin, and never fills up the valleys, as in the case of the more complex dental system in the Horse. The normal number of the grinders is seven in each jaw, while the incisors, as we have already remarked, vary, not only in form, but also are sometimes absent, and canines are not developed in any of the living or fossil members of the family.

THE AFRICAN RHINOCEROSES.

Of the number of species of *Rhinoceros* there is considerable doubt. At least four, possibly five, inhabit Africa, and four Asia. With regard to the African species, we will first take the large "WHITE" RHINOCEROS (*Rhinoceros siseoides*) described by Burchell. This is an animal measuring somewhat over twelve feet in length and about five feet ten inches in height. It has a square nose and two large rounded horns, the anterior one averaging about two feet six inches in length, but not uncommonly found measuring three feet six inches, sometimes even over four feet; the posterior rarely or never exceeding fifteen inches, and generally not being more than twelve inches. Its skin is smooth, and without any of those folds so characteristic of the Asiatic species. It inhabits all the country south of the Zambesi, and probably it may also exist in Central Africa. It feeds solely on grass, and sometimes collects into small herds.

Oswell's *Rhinoceros** is in no way differs from *R. siseoides*, except that the front horn points

* *Rhinoceros Oswelli*.



TEETH OF RHINOCEROS. A, UPPER; B, LOWER JAW.

forwards, and in some cases even downwards. This Mr. Dromstedt considers not to be a distinct species, but only an accidental and local variety.

The so-called **Black Rhinoceros** (*Rhinoceros bicornis major*) is a much smaller animal than *R. sinuatus*, being about eleven feet in length and five feet in height, with an elongated head and horns thicker in proportion to length than those of *R. sinuatus*. The front horn is twenty inches or



"WHITE" RHINOCEROS.

twenty-two inches in length, and never attains to more than twenty-six or twenty-eight inches; while the back horn averages ten inches or twelve inches. Its skin is not black, but flesh-coloured, and the upper lip is highly prehensile. The first specimen ever brought to Europe was captured in Upper Nubia in 1848, and was provided with a lodging in the Regent's Park Zoological Gardens. It is found in all the country south of the Zambesi; inhabits thorn thickets chiefly (in which *R. sinuatus* is never found), but occasionally occurs in other jungle or open ground. It feeds chiefly on thorn leaves and branches, though also eating grass, for the plucking of which its flexible upper lip is as well fitted as the long tongue of the Giraffe. It is gregarious, five or six being sometimes found together.

The **KEITLOA**, or Sloan's Rhinoceros (*Rhinoceros leifsoi*), differs but little from *R. bicornis major*,

excepting in the formation of the head, which is somewhat shorter and broader, and it has a less prehensile lip. Its chief characteristic is the posterior horn, which is flattened at the sides, being of almost equal length to the anterior, and even occasionally longer, twenty inches and twenty-two inches being about the average. It is found sparingly in all the country south of the Zambesi, and is not gregarious, a bull and cow only being usually seen together. *RHINOCEROS BICORNIS MINOR* is the smallest,



RHINOCEROS.

being seldom over ten feet in length, or more than four feet ten inches in height. The head is more elongated and the nose more prehensile than in any other species, while the legs are shorter in proportion and the feet smaller. The anterior horns rarely exceed twelve inches, and the posterior seven or eight inches. It is usually found only between Zululand and the Limpopo river, although it has been killed farther north, not far from the Zambesi. It is not gregarious, two full-grown cows and a calf being the greatest number that has been recorded as seen together. It feeds on thorns, leaves, and shoots, and rarely, if ever, is found out of the thorn jungle.

Until recent times, it was universally believed that the hide of a Rhinoceros was too tough to allow a bullet to penetrate; indeed, even now in popular opinion the belief is still retained, but, like many popular opinions, it has been proved to be untrue; and that a Rhinoceros may be as easily shot

with an ordinary bullet as an Ox is fully established on the authority of Gordon Cumming, Sir S. Baker, Dr. Livingstone, and others.

Sir S. Baker, in his "Nile Tributaries," gives the following interesting account of a Rhinoceros hunt:—"We were leisurely returning home through alternate plains and low open forests of mimosa when Taher Sheriff, who was leading the party, suddenly reined up his Horse, and pointed to a thick bush, beneath which was a large, grey, but shapeless mass. He whispered, as I drew near, 'Oss qerin' (mother of the horn), their name for the Rhinoceros. I immediately dismounted, and with the short No. 10 Tatham rifle I advanced as near as I could, followed by Saleiman, as I had sent all my gun-bearers direct home by the river when we had commenced our circuit. As I drew near, I discovered two Rhinoceroses asleep beneath a thick mass of bushes; they were lying like Pigs, close together, so that at a distance I had been unable to distinguish any exact form. It was an awkward place; if I were to take the wind fairly, I should have to fire through the thick bush, which would be useless; therefore I was compelled to advance with the wind direct from me to them. The aggressors remained about a hundred yards distant, while I told Saleiman to return, and hold my Horse in readiness with his own. I then walked quietly to within about thirty yards of the Rhinoceroses, but so curiously were they lying that it was useless to attempt a shot. In their happy dreams they must have been suddenly disturbed by the scent of an enemy, for, without the least warning, they suddenly sprang to their feet with astonishing quickness, and with a loud and sharp whiff, whiff, whiff! one of them charged straight at me. I fired my right-hand barrel in his throat, as it was useless to aim at the head, protected by two horns at the nose. This turned him, but had no other effect, and the two animals thundered off together at a tremendous pace. Now for a 'tally ho!' Our stock of gun was scattered on the ground, and away went the aggressors in full speed after the two Rhinoceroses. Without waiting to re-load, I quickly remounted my Horse Tital, and, with Saleiman in company, I spurred hard to overtake the dying Arabs. Tital was a good strong colt, but not very fast; however, I believe he never went so well as upon that day, for, although an Abyssinian Horse, I had a pair of English spurs, which worked like minisseries, but with a more decided result. The ground was awkward for riding at full speed, as it was an open forest of mimosa, which, although wide apart, were very difficult to avoid, owing to the low crowns of spreading branches; these, being armed with fish-back thorns, would have been serious on a collision. I kept the party in view until, in about a mile, we arrived upon open ground. Here I again applied the spurs, and by degrees I crept up, always gaining, until I at length joined the aggressors. Here was a sight to drive a hunter! The two Rhinoceroses were running neck and neck, like a pair of Horses in harness, but bounding along at tremendous speed within ten yards of the leading Hunter. This was Taher Sheriff, who, with his sword drawn and his long hair flying wildly behind him, urged his Horse forward in the race, amid a cloud of dust raised by the two huge but active beasts, that tried every sinew of the Horses. Roder Sheriff, with the withered arm, was second; with the reins hung upon the hawk-like claw that was all that remained of a hand, but with his naked sword grasped in his right, he kept close to his brother, ready to second his blow. Abou Do was third; his hair flying in the wind, his heels dashing against the flanks of his Horse, to which he shouted in his excitement to urge him to the front, while he leant forward with his long sword, in the wild energy of the moment, as though hoping to reach the game against all possibility. Now for the spurs! and as these, vigorously applied, screwed an extra stride out of Tital, I soon found myself in the rack of men, horses, and drawn swords. There were seven of us, and passing Abou Do, whose face wore an expression of agony at finding that his Horse was falling, I quickly obtained a place between the two brothers, Taher and Roder Sheriff. There had been a jealousy between the two parties of aggressors, and each was striving to outdo the other; thus Abou Do was driven almost to madness at the superiority of Taher's Horse, while the latter, who was the renowned hunter of the tribe, was determined that his sword should be the first to taste blood. I tried to pass the Rhinoceros on my left, so as to fire close into the shoulder my remaining barrel with my right hand, but it was impossible to overtake the animals, who bounded along with undiminished speed. With the greatest exertion of man and horses, we could only retain our position within about three or four yards of their tails—just out of reach of the swords. The only chance in the race was to hold the pace until the Rhinoceroses should begin to flag. The Horses were pressed to the utmost; but we had already run about two miles, and the game showed no signs of giving in. On



THE RHINOCEROS HUNT.

they flew—sometimes over open ground, then through low bush, which tried the Horses severely; then through strips of open forest, until at length the party began to tail off, and only a select few kept their places. We arrived at the summit of a ridge, from which the ground sloped in a gentle inclination for about a mile towards the river; at the foot of this incline was thick, thorny, matted jungle, for which impenetrable covert the Rhinoceroses pressed at their utmost speed. Never was there better ground for the finish of a race; the earth was sandy, but firm, and as we saw the winning post in the jungle that must terminate the hunt, we redoubled our exertions to close with the unfatigued game. Subman's Horse gave in—we had been for about twenty minutes at a killing pace. Tétel, although not a fast Horse, was good for a distance, and we now proved his power of endurance, as I was riding at least two stons heavier than any of the party. Only four of the seven remained; and we swept down the incline, Taher Sheriff still leading, and Alon Do the best! His Horse was done, but not the rider; for, springing to the ground while at full speed, sword in hand, he forsook his tired Horse, and, preferring his own legs, he ran like an Antelope, and for the first hundred yards I thought he would really pass us and win the honour of first blow. It was of no use; the pace was too severe, and, although running wonderfully, he was obliged to give way to the Horses. Only three now followed the Rhinoceroses. Taher Sheriff, his brother Rodur, and myself. I had been obliged to give the second place to Rodur, as he was a mere Monkey in weight; but I was a close third. The excitement was intense; we neared the jungle, and the Rhinoceroses began to show signs of flagging, as the dust puffed up before their nostrils, and, with noses close to the ground, they snorted as they still galloped on. 'Oh for a fresh Horse!' We were within two hundred yards of the jungle; but the Horses were all done. Tétel reeled as I urged him forward; Rodur pushed ahead; we were close to the dense thorns, and the Rhinoceroses broke into a trot; they were done! Away went Taher; he was close to the very heels of the beasts, but his Horse could do no more than his present pace; still he gained upon the nearest; he leaned forward, with his sword raised for the blow—another moment and the jungle would be reached! One effort more, and the sword flashed in the sunshine, as the foremost Rhinoceros disappeared in the thick screen of thorns, with a push about a foot long upon his hind-quarters. Taher Sheriff shook his bloody sword in triumph above his head; but the Rhinoceros was gone—we were fairly

beaten, regularly outpaced. Tabor Sheriff explained that at all times the Rhinoceros was the most difficult animal to subvert, on account of his extraordinary swiftness, and, although he had killed many with the sword, it was always after a long and fatiguing hunt, at the close of which the animal, becoming tired, generally turned to bay, in which case one hunter occupied his attention, while another galloped up behind and severed the hamstring. The Rhinoceros, unlike the Elephant, can go very well upon three legs, which enhances the danger, as one cut will not utterly disable him."

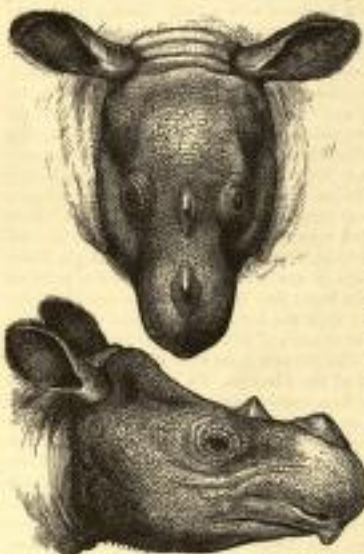
Not infrequently, however, it is the hunter who has to fly away before the Rhinoceros, as Sir R. Baker found out to his cost in the Upper Nile.

Geoffrey Cunningham, in his "Hunter's Life in South Africa," gives the following details of the Rhinoceros:—"Of the Rhinoceros there are four varieties in South Africa, distinguished by the Bechuanas by the names of the *Bordé*, or Black Rhinoceros; the *Kéilloa*, or Two-horned Black Rhinoceros; the *Machoché*, or common White Rhinoceros; and the *Robasta*, or Long-horned White Rhinoceros. Both varieties of the Black Rhinoceros are extremely fierce and dangerous, and rush headlong and unprovoked at any object which attracts their attention. They never attain much fat, and their flesh is tough, and not much esteemed by the Bechuanas. Their food consists almost entirely of the thorny branches of the *waitabit* thorns. Their horns are much shorter than those of the other varieties, seldom exceeding eighteen inches in length. They are finely polished with constant rubbing against the trees. The skull is remarkably formed, its most striking feature being the tremendously thick ossification in which it ends above the nostrils. It is on this mass that the horn is supported. The horns are not connected with the skull, being attached merely by the skin, and they may thus be separated from the head by means of a sharp knife. They are hard and solid throughout, and are a fine material for various articles, such as drinking-cups, mallets for rifles, handles for turners' tools, &c., &c. The horn is capable of taking a very high polish. The eyes of the Rhinoceros are small and sparkling, and do not readily observe the hunter, provided he keep to leeward of them. The skin is extremely thick, and only to be penetrated by bullets hardened with solder. During the day the Rhinoceros will be found lying asleep, or standing indolently in some retired part of the forest, or under the base of the mountains, sheltered from the power of the sun by some friendly grove of umbrella-topped *minomas*. In the evening they commence their nightly rambles, and wander over a great extent of country. They usually visit the fountains between the hours of nine and twelve o'clock at night, and it is on these occasions that they may be most successfully hunted and with the least danger. The Black Rhinoceros is subject to paroxysms of unprovoked fury, often ploughing up the ground for several yards with its horns, and assaulting large herds in the most violent manner. On these bushes they work for hours with their horns, at the same time snorting and lowering loudly, nor do they leave them in general until they have broken them in pieces. All the four varieties delight to roll and wallow in the mud, with which their ragged hides are generally encrusted. Both varieties of the Black Rhinoceros are much smaller and more active than the white, and are so swift that a Horse with a rider on his back can rarely overtake them. The two varieties of the White Rhinoceros are so similar in habits that the description of one will serve for both; the principal difference consisting in the length and set of the anterior horn: that of the *Machoché* averaging from two to three feet in length, and pointing backwards; while the horn of the *Robasta* often exceeds four feet in length, and inclines forward from the nose at an angle of 45°. The posterior horn of either species seldom exceeds six or seven inches in length. The *Robasta* is the rarer of the two, and it is found very far in the interior, chiefly to the eastward of the *Limpopo*. Its horns are very valuable for loading-rods, supplying a substance at once suitable for a speering implement and excellent for the purpose. Both these varieties of Rhinoceros attain an enormous size. They feed solely on grass, carry much fat, and their flesh is excellent, being preferable to beef. They are of a much milder and more inoffensive disposition than the Black Rhinoceros, rarely charging their pursuer. Their speed is very inferior to that of the other varieties, and a person well mounted can overtake and shoot them. The head of these is a foot longer than that of the *Bordé*. They generally carry their heads low; whereas the *Bordé*, when disturbed, carries his very high. Unlike the Elephants, they never associate in herds, but are met with singly or in pairs. In districts where they are abundant from three to six may be found in company; and I once saw upwards of a dozen congregated together on some young grass; but such an occurrence is rare."

Gordon Cumming relates that the Rhinoceros and Hippopotamus are usually attended by little birds known as Rhinoceros Birds, "their object being to feed upon the ticks and other parasites that swarm upon these animals. They are of a greyish colour, and are nearly as large as a common Thrush. Their voice is very similar to that of the Mistletoe Thrush. Many a time have these ever-watchful birds disappointed me in my stalk, and tempted me to invoke an anathema upon their devoted heads. They are the best friends the Rhinoceros has, and rarely fail to awaken him even in his soundest nap. 'Chukuroo' perfectly understands their warning, and, springing to his feet, he generally first looks about him in every direction, after which he invariably makes off. I have often hunted a Rhinoceros on horseback which led me a chase of many miles, and required a number of shots before he fell, during which chase several of these birds remained by the Rhinoceros to the last. They reminded me of mariners on the deck of some bark sailing on the ocean, for they perched along his back and sides; and as each of my bullets told on the shoulder of the Rhinoceros, they ascended about six feet into the air, uttering their harsh cry of alarm, and then resumed their position. It sometimes happened that the lower branches of trees, under which the Rhinoceros passed, swept them from their living deck; but they always recovered their former station. They also adhere to the Rhinoceros during the night. I have often shot these animals at midnight when drinking at the fountains, and the birds, imagining they were asleep, remained with them till morning; and on my approaching, before taking flight, they exerted themselves to their utmost to awaken Chukuroo from his deep sleep."

THE ASIATIC RHINOCEROSES.

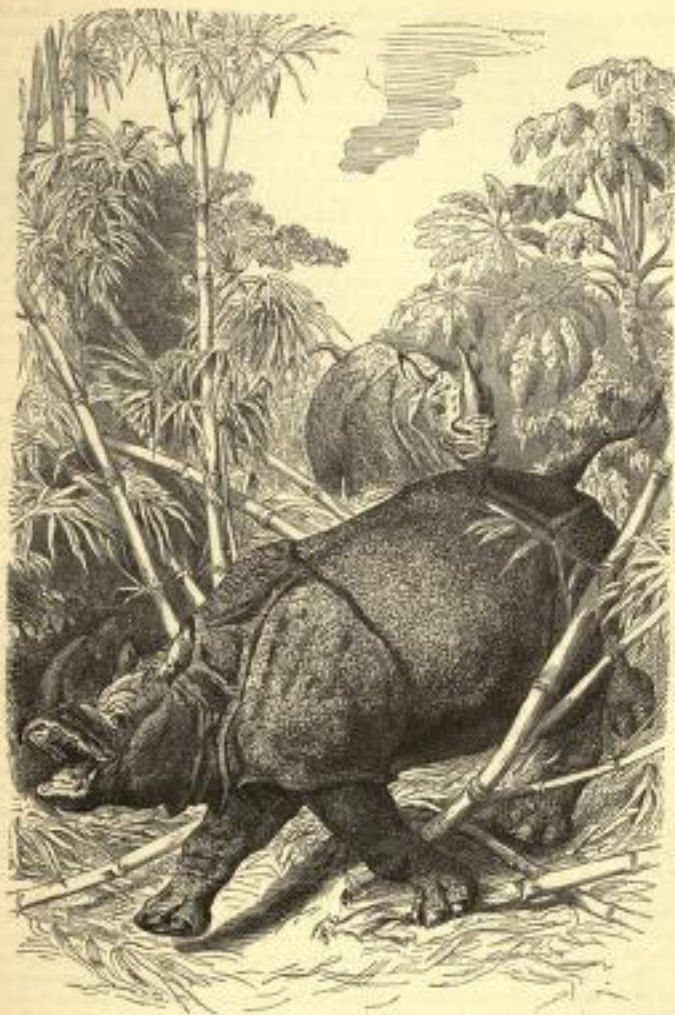
There are four different Rhinoceroses in Asia, of which two are characterised by the possession of one horn, while the remaining two possess two horns, as in the African species. All the adult Asiatic possess incisors or front teeth, which are conspicuous by their absence from the African species. The



FRONT AND SIDE VIEWS OF HEAD OF SUMATRAN RHINOCEROS.
(From the Proceedings of the Biological Society.)

normal number of these is four in the upper, and four in the lower jaws, the median pair being the larger in the upper, and the smaller in the lower. The development of these teeth seems to stand in relation to the development of horns, those animals with the smallest horns being provided with the largest incisors. The most familiar is the Indian Rhinoceros (*Rhinoceros unicornis* = *R. indica*, Currier), with a single horn on the nose, and thick naked skin covered with large boss-like granulations, which lies in massive folds on various parts of the body, and more especially behind and across the shoulders and before and across the thighs. There are a few stiff hairs on the tail and ears. It inhabits the East Indies, principally beyond the Ganges, and is recorded as having been found in Bengal, Siam, and Cochin-China. It is found in shady forests, the neighbourhood of rivers, and marshy places, its food consisting of herbage and branches of trees. The fully-grown animal rarely arrives at a greater height than five, and its average may be taken at four feet.

Williamson, in his "Oriental Field Sports," speaking of the Indian Rhinoceros, describes it as an inveterate enemy of Elephants, attacking whenever he can find them single, or, at least, not protected by a male of great bulk; ripping without mercy, and confiding in his coat of mail to defend him from the puny attacks of the females, as well



INDIAN RHINOCEROS.

as to resist the tusks of young males. He relates that the apparent bluntness of the horn of the Indian Rhinoceros, which is about as broad at the base as it is high, would make it appear a somewhat insignificant weapon, and inadequate to penetrate any hard or tough substance. This, however, we are informed, is not the case, Elephants often being found dead, obviously, it is stated, from the wounds received from the horn of the Rhinoceros; and in one case, as is related by Williamson, a large male Elephant and Rhinoceros were found both dead together, the Elephant's abdomen having been ripped open, and the Rhinoceros's horn found transfixed beneath the ribs. Williamson also states that Major Lally, an officer of the Indian army, whose veracity is beyond question, while engaged in one of his hunting expeditions, and having arrived at the summit of a low range of hills, was suddenly presented with a distinct view of a most desperate engagement between a Rhinoceros and a large male Elephant, the latter, to all appearance, protecting a small herd which were retiring in a state of alarm. The Elephant was beaten, and decamped, followed by the Rhinoceros, into a heavy jungle, where much roaring was heard, but nothing could be discerned. From this we may conclude that the habit which Pliny describes of the Rhinoceros ripping open the Elephant is confirmed by modern observation.

THE JAVAN RHINOCEROS (*R. sondaicus* = *R. javanicus* of Cuvier) is a smaller representative of the Indian Rhinoceros, with the skin not so coarsely granulated, and the folds not so strongly marked. It is covered with a sparse growth of bristles, and its head and limbs are longer and more slender in their proportions than in the latter species. It inhabits Java and the Malay Peninsula, and the Sunderbunds of Bengal, living on herbage and the branches of trees.

THE SUMATRAN RHINOCEROS (*R. sumatrensis* of Cuvier) is the more commonly known of the two two-horned species inhabiting Asia. Its head is armed with two obtusely-pointed horns, its body is covered with bristles, and the folds of the skin are deep, and especially that behind the shoulder. The folds on the neck, however, are not so distinct as in the one-horned species.

THE HAIRY-EARED RHINOCEROS (*R. lasiotis*) has been confounded by naturalists with the Sumatran species, until Dr. Schater showed from the comparison of these two animals, in the Zoological Gardens, that they were specifically distinct. The former is characterised by the long hairy fringe to the ears, by the covering of long fine reddish hair on the body, the smoother and more finely granulated skin, and the shorter tail. The one in Regent's Park was captured in January, 1858, under very singular circumstances, as described in the following extract from a Calcutta newspaper:—"The quiet station of Chittagong has been lately enlivened by the presence of a Rhinoceros. It appears that about a month ago some natives came into Chittagong and stated that a Rhinoceros had been found by them in a quicksand, and was quite exhausted with the efforts to relieve herself. They had attached two ropes to the animal's neck, and with the assistance of about 200 men dragged her out, and keeping her taut between two ropes they eventually made her fast to a tree. The next morning, however, they found the Rhinoceros so refreshed, and making such efforts to free herself, that they were frightened, and made application to the magistrate of Chittagong for protection. The same evening Captain Hood and Mr. H. W. Wickes started with eight Elephants to secure the prize, and after a march of about sixteen hours to the south of Chittagong they came up with the animal. The Elephants, at the first sight of the Rhinoceros, were very much afraid, and belted one and all, but after some exertion they were brought back and made to stand by. A rope was now with some trouble attached to the animal's hind leg, and secured to an Elephant. At this juncture the Rhinoceros roared; the Elephants again belted, and had it not been for the rope slipping from the leg of the Rhinoceros, that limb might have been pulled from the body. The Rhinoceros was, however, eventually secured with ropes between Elephants, and marched into Chittagong in perfect health. Two large rivers had to be crossed—first the Sengoo River, where the animal was towed between Elephants, for she could not swim, and could only just keep her head above water by paddling with the fore-feet like a Pig; and, secondly, the Karnafoole River, when the ordinary cattle ferry-boat was used. Thousands of natives thronged the march in, which occupied a few days, the temporary bamboo bridges on the Government road invariably falling in with the numbers collected thereon to watch the Rhinoceros crossing the stream below; and sometimes the procession was at least a mile in length. The 'Begum,' as the Rhinoceros has been named, is now free from all ropes, and kept within a stockade enclosure, having therein a good bath excavated in the ground, and a comfortable covered shed attached. She is already very tame, and will take plasmain leaves or chapatties from the hand,



HAIRY-RUMPED RHINOCEROS. (From the Proceedings of the Zoological Society.)

and might almost be led about by a string." Begun was ultimately brought to London, and sold to the Zoological Society for £1,250.

THE FOSSIL RHINOCEROSES.

Although the species of Rhinoceroses living at the present time are but few, the researches of paleontologists show us that in past time the number of species was considerable, and that they were not, as now, confined to the warmer parts of the Old World, but were distributed over a large portion of Northern Asia and Europe.

The first representative of the Rhinoceros family is the *Orthoryxodon*, an animal with large upright canines, discovered in the Upper Eocene strata of the United States. The fossil Rhinoceroses properly so called are first found in the Miocene, and are divided into four groups. The first group is characterised by the nostrils being separated by a bony partition, and in the adult animal the incisor teeth are lost: the second is distinguished by the absence of a bony partition between the nostrils, and the incisor teeth are of a medium size: in the third there is no partition, but the incisors are large; and in the fourth it is imperfectly developed.

An example of the first group, and probably the best known form of all the extinct Rhinoceroses, is *Rhinoceros tiberhiensis*, or the Woolly Rhinoceros. Like that of the Mammoth, with which animal it was evidently associated, its entire body was covered with hair and wool, the skin had no folds, and its nose carried two horns, the anterior of which was of remarkable size, and characteristic of the group to which it belongs; the nostrils were separated by a complete bony partition. The Woolly Rhinoceros has been discovered under similar circumstances to that of the Mammoth, having been found embedded in ice in the northern latitudes of Asia, in the years 1771 or 1772, being some twenty years previous to that of the discovery of the first Mammoth by a fisherman named Schumacher. According to Pallas, the discovery was made by some Yakuts, who were on a hunting expedition, and took its dimensions on the spot; it was about eleven and a half feet in length. Its body was still clothed with skin, but altogether the animal was so far decomposed that not more than the head and feet could be brought away. On the skin many short hairs still remained. The range of the Woolly Rhinoceros was undoubtedly the same as that of the Mammoth, except that it did not cross Behring Strait, and, consequently, its remains are not found in America. The remains of the Woolly Rhinoceros are found in numerous

caves is associated with the remains of Hyænas, having undoubtedly been a staple article of food for these animals. In England remains have been found in the caves at Crowell, Nottinghamshire; in the Beishams Cave; in Kent's Hole, near Torquay, Devonshire; and in Woolley Hole, near Wells, Somerset, as well as in the caves of Wales and Derbyshire.

As an example of the second group, we have *Rhinoceros tiberianus* of the Pliocene and Pleistocene strata. This animal possessed two horns. Its remains are found in France and Italy, and in the pre-glacial forest bed of Cromer, and in the lower brick earths of the Thames valley. *Rhinoceros incisivus* represents the third group in Miocene times. It had no bony septum between the nostrils, the incisors are large, and there are four toes on the fore-foot. Of the fourth group the best examples are *R. elvianus* and *R. leptorhinus*. The former of these possessed two horns, and the nostrils were separated by an imperfect bony septum. Its remains are found in various Pliocene and Pleistocene deposits. The latter also possessed two horns, and its nostrils were divided by a thin and delicate bony partition, which can only be termed imperfect in comparison with the massive partition in the Woolly Rhinoceros. It is devoid of incisors. This species is found in Pleistocene deposits in Britain, France, and Italy, in caverns, and in river-beds, the most



SKULL OF FOSSIL RHINOCEROS [*R. LEPTORHINUS*].

perfect remains being met with in the valley of the Thames near Eford. These were collected by Sir Antonio Brady, and are now to be seen in the British Museum. In the figure the fragile nose septum is represented as broken.

The genus *Aceratherium*, of Karp, is a hornless Rhinoceros, found in the same Miocene strata as the *R. incisivus*. Like the latter, it possesses incisors, and, not improperly, may be considered as a female of the latter species, if the horn be viewed as a sexual characteristic: first of all in the possession of the male, and afterwards transferred by descent, in the case of all the Post-Miocene Rhinoceroses, to the female.

THE EXTINCT FAMILY PALEOTHERIIDÆ.

The Paleotheriids, or fourth family to be considered under the head of the Perissodactyla, is that which is found only in the fossil state in the Eocene strata of Europe and North America. They are allied, on the one hand, to the Horses, and on the other to the Tapirs. The type of the family, the *Paleotherium*, was originally discovered by Cuvier in the quarries of Montmartre, near Paris. The grinding teeth closely resemble, in the pattern of their grinding surfaces, those of the Rhinoceros. The full complement, however, of incisors and canines, as well as of grinders, is present in each jaw, namely—Incisors, 3; canines, 1; premolars, 4; molars, 3. These animals varied in size from that of a Roeder to that of a Tapir, and were possessed of three well-developed hoof-bearing toes.

The genus *Macrauchenia* is also an extinct form, constituting a separate family, *Macrauchenidiæ*, peculiar to the later Tertiaries of South America. Its skull is, on the whole, like that of the Horse, but the nasal bones are short and like those of the Tapir. It possessed a long neck, like the Llama, and a full complement of teeth, partly equine, partly resembling those of Rhinoceros. Both fore and hind feet were furnished with three toes.

W. BOYD DAWKINS.
H. W. OAKLEY.