

A Century of Natural History

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**BOMBAY NATURAL HISTORY SOCIETY
1983**

The Moghul Emperors of India as Naturalists and Sportsmen

[1927]

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The title of this paper is somewhat misleading, hence it may be advisable at the outset to indicate its scope. The term 'Moghul Emperors' here represents only the Big Six, from Babur—the illustrious founder of the dynasty—to Aurangzebe, with whose death the great empire launched on a career of steady and rapid decline.

The 'Naturalists' of the title also needs qualification. It stands here only in respect of animal life, though it is well known that the Moghuls were great lovers of Nature in all its other aspects as well.

The wonderful gardens¹ built by them all over Northern India remain to this day to bear testimony to their love for flowers and trees, and the genuine delight which Babur and his great-grandson Jehangir felt in the natural objects they saw around them cannot help impressing anyone who wades through the inimitable memoirs left us by these two sovereigns.

To avoid repetition of lengthy titles of works which I have most frequently quoted, I propose to use the following abbreviations:-

Babur = *Memoirs of Zahiruddin Mohomed Babur*, translated from the Chagatai Turki by John Leyden, M.D. and William Erskine in two volumes, annotated and revised by Sir Lucas King, C.S.I., LL.D., F.S.A.

Jeh. = *Tuzuk-e-Jehangiri* or *Memoirs of*

Jehangir, written by the Emperor himself and translated in two volumes from the Persian by Alexander Rogers, I.C.S. (Retd.) and H. Beveridge, I.C.S. (Retd.)

Ain. = *Ain-e-Akbari* by Abul Fazl, translated by Blochmann (first volume) and Jarrett (second and third volumes).

Names of other works quoted from occur in full in the text.

Though it is not my purpose to go into the history of the rise and fall of this great house, the following few remarks concerning each of the six sovereigns may not be out of place for introducing my subject.

BABUR

One of Babur's first cares after his victory at Panipat in A.D. 1526 was to describe at length the land of his acquisition, its peoples, customs, animals, fruits and flowers: to compile in fact a comprehensive Gazetteer of Hindustan. The outstanding feature of his accounts is their extreme truthfulness and accuracy. If there is anything of which he is not positive at the time of writing, he does not omit to make special mention of the fact, and hearsay of the veracity of which he is not convinced is likewise duly recorded as such.

Whether engaged in weighty affairs of state, or in marching against a foe, Babur always had his senses wide awake to objects around him beyond the pale of his immediate con-

¹ For descriptions of the gardens see C. M. Villiers. *The Gardens of the Great Moghuls*.

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A LION HUNT WITH BUFFALOES

Reproduced by the courtesy of the Trustees of the Prince of Wales Museum of Western India, Bombay from a Moghul painting
Photo: Sadashiv Gorakshkar

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cern. A new flower or bird or beast never failed to excite in him a feeling of the profoundest interest. He made a careful mental note of the object, and reproduced it faithfully in his memoirs whenever he found a temporary respite from the arduous duties of kingship in a newly conquered and unsettled country. For example, the Pied Myna (*Sturnopastor contra*) finds a place in this memoirs thus: 'When I threw a bridge over the Ganges and crossed it, driving the enemy before me, I saw in Lucknow, Oudh and these countries, a species of Sharak which has a white breast and a piebald head with a black back. I had never seen it before. This species probably does not learn to speak at all.'

Of the larger mammals of Hindustan, the rhinoceros was one that must have seemed altogether strange and unnatural to the conquerors, and Babur took great delight in hunting the beast. In his memoirs he gives the following account of a hunt. (This was at the time of his final march against Hindustan which ended successfully at Panipat.):—

'We continued our march till we came near Bekram (Peshawar) and then halted. Next morning we continued halting in the same station, and I went out to hunt the Rhinoceros. We crossed the Siah-ab (i.e. Black river—perhaps another name for the Bara) in front of Bekram, and formed our ring lower down the river. When we had gone a short way, a man came after us with notice that a rhinoceros had entered a little wood near Bekram and that they had surrounded

the wood and were waiting for us. We immediately proceeded towards the wood at full gallop and cast a ring round it. Instantly on our raising the shout the rhinoceros issued out into the plain. Humayun and those who had come from the same quarter (i.e. from Turkestan) never having seen a rhinoceros before, were greatly amused. They followed it for nearly a day, shot many arrows at it and finally brought it down. The rhinoceros did not make a good set at any person or any horse. They afterwards killed another rhinoceros. I had often amused myself by conjecturing how an elephant and rhinoceros would behave if brought to face each other; on this occasion the elephant-keepers brought out the elephants so that one elephant fell right in with the rhinoceros. As soon as the drivers put their beasts in motion the rhinoceros would not come up but immediately ran off in another direction.'

Further on Babur mentions, 'In the course of my expeditions into Hindustan, in the jungles of Peshawar and Hashnagar I frequently killed the rhinoceros. It strikes powerfully with its horn, with which in the course of these hunts, many men and horses were gored. In one hunt it tossed with its horn a full spear's length, a young man named Maksud, whence he got the name of "Rhinoceros Maksud" (i.e. Rhino's aim).'

It appears truly remarkable that a man in Babur's situation, faced with innumerable and ever-recurring practical and administrative difficulties in a foreign and unsettled land,

pite its bulk and strength the rhino is as a rule quiet and inoffensive. Owing to the nature of the terrain they inhabit, elephants are almost always used in rhino hunting in India. As a rule the mounts remain indifferent in the presence of the enemy though occasionally one takes fright and bolts.

¹ Now *Sturnus contra*.

² Captain Williamson in his *Oriental Field Sports* recounts several incidents of the deadly enmity that is supposed to exist between the rhinoceros and the elephant and the stories copied from this not over-veracious source have subsequently found their way into European works on Natural History. Des-

with the prospect of rebellion within and invasion without perpetually staring him in the face—with marked discontent amongst his troops and following to boot—should have found time to devote himself so earnestly to minor pleasures which would probably have had no appeal for lesser natures than his own.

HUMAYUN

On the death of Babur, his son Humayun ascended the throne of Hindustan. Unfortunately he appears to have kept no memoirs of himself and the chief contemporary records available to us are the *Tazkereh-alyakeat*¹ (or private memoirs of the Emperor Humayun) written by his confidential domestic Jouhar, and the delightful *Humayun Nama*² of his sister Gulbadan Banu Begum.

These tell us extremely little of the aspect of Humayun's nature that concerns our paper, but however suffice to establish the fact that he had inherited in full measure his father's love of nature and fondness for sport.

That Humayun was naturalist at heart is evident from just this one little passage that appears in the *Tazkereh*. To realize the true significance of the incident it must be remembered that it happened at a time when defeated by Sher Shah and deprived of his kingdom, he was fleeing for his life and liberty through the inhospitable desert of Sind—a harassed refugee—subjected to the greatest hardships from hunger and thirst, and accompanied only by a mere handful of his faithful adherents. At Amerkote, '... the king undressed and ordered his clothes to be washed, and in the meantime

wore his dressing gown. While thus sitting a beautiful bird flew into the tent the doors of which were immediately closed and the bird caught. His Majesty then took a pair of scissors and cut some of the feathers off the animal; he then sent for a painter and had a picture taken of the bird and afterwards ordered it to be released.'

A temperament capable of being roused from the gravest anxiety and concern to light-hearted pleasure and interest at the mere sight of a strange and insignificant bird, surely proves a more than ordinarily deep-rooted love for Nature.

AKBAR

Akbar, rightly called 'the Great' reigned over Hindustan from 1556 to 1605. Summing up his character Dr. Richard von Garbe³ states: 'Akbar was very fond of flowers and perfumes and especially enjoyed blooded doves (pigeons) whose care he well understood. About 20,000 of these peaceful birds are said to have made their homes in the battlements of his palace.' His historian (Abul Fazl) relates, 'His Majesty deigned to improve them in a marvellous manner by crossing the races which had not been done formerly.'

'Akbar was passionately fond of hunting and pursued the noble sport in its different forms, especially the tiger hunt and the trapping of wild elephants, but he also hunted with trained falcons, and leopards. He was not fond of *battue*; he enjoyed the excitement and exertion of the actual hunt as a means of exercise and recreation for training the eye and quickening the blood. Besides chess, cards and other games, fights between animals may be specially mentioned, of which elephant fights were the most common but there were also contests between camels, buffaloes, cocks and even frogs, sparrows and spiders.'

¹ Translated from the Persian by Major Charles Stewart of the Hon. East India Company's Service.

² Translated by Mrs. Annette S. Beveridge.

³ *Akbar, Emperor of India, A Picture of Life and Customs from the sixteenth century.*

Akbar was passionately fond of animals, and the Royal Menagerie was a very extensive one comprising of, as Abul Fazl states, 'Animals of all kinds from Persia, Turkestan and Kashmir, whether game or other which had been brought together to the wonderment of beholders.' Bernier mentions that the inmates of this menagerie were led past under the royal window where the monarch 'at every day about noon, the procession commencing with the horses and elephants. Other animals are next introduced' continues the writer, 'tame antelopes kept for the purpose of fighting with each other; Nilgaux or grey oxen that appear to me to be a species of elk; rhinoceroses; large Bengal buffaloes with prodigious horns that enable them to contend against lions and tigers; tame leopards or panthers employed in hunting antelopes; some of the fine sporting dogs from Usbec of every kind and each dog with a small red covering; lastly every species of birds of prey used in field sports for catching partridge, cranes, hares and even it is said, for hunting antelopes on which they pounce with violence beating their heads and blinding them with their wings and claws.'

Abul Fazl informs us that Akbar paid great attention to the selection and breeding of elephants, camels, cows, mules and horses and that through his encouragement of the last, the breed of horses produced in Hindustan was as fine as those of Irak or Arabia.

One of the modes of hunting most frequently employed by the Moghul emperors was the *Qamarzahi* or 'Ringing-in' method. Vast tracts of country were surrounded by the armies which gradually worked their way

¹ The Emperor Akbar was particularly fond of this sport and in the *Un.* pp 218-22 are to be found full details regarding the kind of fighting deer, how they fought together, and elaborate regulations as to the betting allowed on such encounters.

towards the centre driving in and collecting the game. On account of the area over which operations extended, very often hundreds of square miles, the processes occupied several months. The various divisions of the army were placed under command of their proper officers, and the whole thing was really in the nature of what are now known as Army Manoeuvres. As the favourite plan of campaign of the Moghuls was to surround an enemy first and then gradually close in upon him, these *Qamarzahi* hunts provided the means of keeping the soldiery in the necessary training and practice in times of peace.

One such 'drive' that took place under orders of the Emperor Akbar in the year 1567 is remarkable for the magnitude of the scale on which operations were carried out. On this occasion 50,000 beaters were employed and, according to Abul Fazl involved all the country 'from near the mountains on the one side and from River Bihat (Jhelum) on the other.' The historian proceeds: 'Each district was made over to one of the great officers and Bahshis, Tawacis and Sazawals were appointed to every quarter. Several thousand footmen from the towns and villages of Lahore Province were appointed to drive the game. A wide space within ten miles of Lahore was chosen for the collecting of the animals.'

This drive occupied a whole month. When all the arrangements were completed, 'His Majesty the Shah (Akbar) went to the hunting ground and viewed it from the circumference to the centre. Every one of the Grandees and other servants who had exerted themselves in this delightful service was gratified by H.M.'s approbation. Then he placed the foot of dominion in the stirrup of auspiciousness and made his tiger-like steed career in pursuit of the prancing deer. He used the arrow, the sword, the lance and the musket.

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THE CLOSE OF A QAMARGAH HUNT

Reproduced by the courtesy of the Trustees of the Prince of Wales Museum of Western India, Bombay from a Moghul painting

Photo: Sadashiv Gorakshkar

At the beginning the hunting ground was ten miles in circumference, but day by day the *Qamargah* was pushed on and its area lessened....'

Akbar had a special Game Department and caused an account to be kept of all the animals hunted with measurements and the minutest details concerning them.

Besides shooting with the gun Akbar also did a good deal of hunting with the bow and arrow, and several instances are on record of his tackling tigers with these weapons.

He was possessed of remarkable observational powers and it is said of him that he could at once tell by seeing the hide, to what hunting ground a particular deer belonged.

Besides the cheetas (it is asserted to the number of 9,000) and lynxes which largely constituted his hunting establishment, Akbar was extremely fond of good hunting dogs, and imported them from all countries. 'Excellent hunting dogs come from Kabul,' says Abul Fazl, 'especially from the Hazara District (north of Rawalpindi). These dogs will attack every kind of animals, and more remarkable still, they will attack a tiger.'

European bloodhounds were also imported by the Portuguese, which helped them greatly to maintain favour at court.

With regard to the birds employed in the chase, the historian says, 'H. M. is very fond of these remarkable animals and often uses them for hunting purposes. Though he trains the Baz (*Astur palumbarius*), Shahin (*Falco peregrinator*) Shunqar (either *Falco cherrug* or *F. milvipes*) and Burqat falcons (probably the Golden Eagle—*Aquila chrysaetus*) and makes them perform wonderful deeds, H.M. prefers the Bashah (Sparrow Hawk—*Accipiter nisus*), to which class of hawks he gives various names.

If Akbar was the greatest monarch of the Moghul dynasty, it cannot be denied that Jehangir was far and away its greatest naturalist. His profuse and engrossing memoirs are a veritable natural history of the animals that came under his notice, and a record of the most searching observations concerning them.

It has been rightly said of Jehangir that had he been head of a Natural History Museum he would have been a better and happier man. Besides a passion for justice the outstanding features of his character were his love of nature and his powers of observation.

Extensive game preserves were maintained and frequently the emperor hunted accompanied by the ladies of his zenana. His beautiful and accomplished queen Nur Jehan was his constant companion on such occasions. She was an excellent horsewoman and possessed remarkable dexterity in handling a gun. Jehangir gives the following account of a hunt where Nur Jehan killed four tigers in quick succession '...the huntsmen marked down four tigers and I went out to hunt them with my ladies. When the tigers came in sight Nur Jehan Begum submitted that if I would order her she herself would kill the tigers with her gun. I said "Let it be so." She shot two tigers with one shot each and knocked over the two others with four shots. In the twinkling of an eye she deprived of life the bodies of these four tigers. Until now such shooting was never seen that from the top of an elephant and inside of a howdah, six shots should be made and not one miss, so that the four beasts found no opportunity to spring or move. As a reward for this good shooting I gave her a pair of bracelets of diamonds worth one hundred thousand rupees and scattered 1,000 *ashraffis* (gold mohurs) over her.'

It is unnecessary here to dilate upon Jehangir's qualities as a naturalist. His descriptions of animals bespeak his interest and proficiency in unmistakable language.

Like his father, Jehangir also caused minute records to be kept of his hunts with particulars as to the bag, etc. The registers showed that from the twelfth year (1580) of his age to his fiftieth lunar or forty-eighth solar year, 28,532 animals had been taken in his presence, including 17,167 which had been killed by the Emperor himself.

SHAH JEHAN

Shah Jehan ruled over the Moghul Empire from 1627 to 1665. Gifted with the love of nature and artistic temperament of his distinguished ancestors, his name is however best associated with architecture. The palace-fort at Delhi and the peerless Taj at Agra are living tributes to his magnificent regime.

Compared with his father, Shah Jehan's fondness for sport was moderate. He preferred hawking and hunting with cheetas to the actual shooting of game.

The following is an account of one of Shah Jehan's tiger hunts written by Manucci, who lived at his court for a number of years. 'His ordinary amusement,' says the writer, 'was tiger hunting, for which he kept ferocious buffaloes with very big horns. These fought with each other or with tigers, and they are very brave animals, and skilful in the sport above referred to.

When the king desires to go out hunting the huntsmen are warned. These men see to the finding of the tigers and send out into the jungle asses, cows, sheep and goats to pre-

vent the tigers from changing their haunts. The king goes out on his tallest elephant and the other princes likewise on elephants acquainted with the requirements of this sort of fight. They sit in uncovered howdahs, each one with his matchlock. Then they encircle the jungle with high nets, leaving only one opening, through which the king and huntsmen enter. Around the net on the outside stand a number of soldiers, who cannot wound the tiger when it comes near the net, nor can the tiger injure them, for in no manner can it break the net and get out. The order in which the king moves is as follows: In front go the buffaloes, sometimes more than one hundred in number, all in a row. On each one is mounted a man with his legs guarded by leather, and having a broad sword in one hand and holding with the other the reins, which are passed through the buffaloes' nostrils. Behind them comes the king on an elephant, and after the king the princes and the men in highest favour. When they get into the jungle where the tigers are, the buffaloes advance slowly in the formation of a half moon, until the tigers are in sight. After locating the tigers by sight and smell, a circle is formed, leaving them in the centre. In this way, the tigers finding themselves caught, search for an exit. Unable to get away, each one makes its spring in the direction that it sees best. When this spring takes place the man who is mounted on top jumps off with agility, and the buffaloes seize the tigers on their horns with great dexterity and, shaking their heads tear them to pieces. If any one of the tigers escapes the horns or refuses to stir from its place, the king fires his gun and kills it, or gives an order to kill it.

Sometimes they go out to these hunts without taking any buffaloes, but riding on elephants as I have before said. This way of hunting has much more risk for the hunters.

¹ *Storia do Mogor or Mogul India, 1653-1708*, by Niccolao Manucci, translated with introduction and notes by William Irvine, B.C.S. (Retd.), vol. i, p. 191.

Once it happened to King Shah Jehan that a badly wounded tiger bounded up and lunged on with its claws fixed in the elephant's head. The elephant-driver fell to the ground from fright. The king seeing himself in this urgent danger, clubbed his matchlock and hit the tiger on the head with it, but the tiger did not let go, and the elephant finding he could not make use of his trunk, ran furiously till he found a tree, against which he crushed the tiger. It was on this account that Shah Jehan gave orders for the head of the elephants to be protected in future down to the end of the trunk with a covering of thick leather, studded with sharp nails. In addition to the huntsmen, there is always an official present whose business is to take possession of the tiger's whiskers; and therefore as soon as the tiger is dead, they put on his head a leather bag, coming down as far as the neck. Having tied the bag the officer attaches to it his seal. After this the tiger is carried in front of the entrance to the royal tents, when the official appears who has charge of the poisons, and removes the whiskers which are employed as venom.'

AURANGZEBE, 1665-1707

The circumstances under which Aurangzebe came to the throne of Hindustan are well known and no doubt supply the basis for the character in which this Emperor has been painted by most historians of the past.

He was fond of the chase and occasionally indulged in hunting with cheetahs and hawks. Hunting the lion was his favourite sport. The method of hunting most commonly in use at this period also was the *Qamargah* as will

be seen from the following account by Bernier,¹ who was physician at the Court for a number of years: 'I could never conceive how the Great Mogul could hunt with an army of one hundred thousand men, but there certainly is a sense in which he may be said to hunt with 200,000 or with any number of which his army may consist. In the neighbourhoods of Agra and Delhi, along the course of the Jumna reaching to the mountains, there is a large quantity of uncultivated land covered either with copsewood or with grasses six feet high. All this land is guarded with the utmost vigilance; and excepting partridges, and quails and hares, which the natives catch with nets, no person, be he who he may, is permitted to disturb the game which is consequently very abundant. Whenever the monarch is about to take the field, every game keeper near whose district the army is to pass is called upon to apprise the Grand Master of the hunt of the various sorts of game under his particular charge, and of the places where they are in the greatest plenty. Sentries are then stationed at the different roads of that district to guard the tract of ground selected, which extends sometimes four or five leagues; and while the army is on its march, on one side or the other, so as to avoid that tract, the king enters it with as many Omrahs and other persons as have the liberty to do so, and enjoys leisurely and uninterruptedly the sports of the field, varying them according to the nature of the game.'

Bernier then goes on to describe the various methods of hunting, such as with cheetahs, tiger hunts and so on.

The order followed in the arrangements of the descriptions and notes concerning of the animals of Moghul Hindustan is that adopted in the Fauna of British India series.

¹ Francois Bernier, *Travels in the Mogul Empire*, A.D. 1656-1668 (A. Constable).

THE LION

In his Fauna of Hindustan Abul Fazl mentions the lion as being numerous.

Jehangir describes a lion hunt of his father, the Emperor Akbar, in a jungle in the neighbourhood of Lahore 'which was known to be infested by these fierce and ferocious quadrupeds to the number of twenty, male and female.'

Jehangir shot a lion while encamped at the village of Giri in the Subah of Malwa about which he remarks: 'As the braveness of the lion (*Shir babar*) has been established, I wished to look at his intestines. After they were extracted it appeared that in a manner contrary to other animals, whose gall-bladder is outside their liver the gall-bladder of the lion is within its liver. It occurred to me that the courage of the lion may be from this cause.'¹

The shooting of another lion is recorded by the same Emperor in the neighbourhood of Shakkar Tank (now locally called 'Sagan Sea' tank) within the famous fortress of Malwa on about March 25, 1617. On this occasion the lion charged his retinue and mauled ten or twelve persons, whereupon Jehangir 'finished his business with three shots from my gun, and removed his evil from the servants of God.'²

Another lion was shot by him in the neighbourhood of the pergana of Rahimabad (probably in the Bari Duab). This appears to have been a particularly large animal and Jehangir writes of it as follows: 'Of all the tigers (? lions) I have shot from the time I was a prince I never saw a tiger (?) like this for

size and majesty, and the symmetry of its limbs. I ordered the artists to take its portrait according to its real form and body. He weighed 8½ Jehangiri maunds. His length from the top of his head to the end of his tail was 3½ cubits (?) and 2 tassu.'

What has been rendered as cubit here is 'Dara' or 'Zara' in the text. A 'tassu' is 1/24 of a yard, and the length of this lion would therefore be about 10 ft. 3 in.

All translations of this work erroneously state that the animal of this adventure was a tiger, while the painting reproduced in the frontispiece and obviously depicting this very hunt proves conclusively that it was a maneless lion.

'It is related,' says Percy Brown³ 'that Jehangir and his courtiers used to ride these beasts down and kill them with bows, carbines and lances. In all the shikar scenes of the Moguls, the animal is represented as the animal of their choice, pictures of tigers being extremely rare.'

Sir Thomas Roe who visited Jehangir's court as ambassador from James I of England, mentions how a lion and a wolf broke into his quarters one night while encamped at Mandu, and fell upon some sheep in the courtyard. He says, 'I sent to ask leave to kill them; for in that country none but the king may hunt a lion. Leave being granted I went out in the court: the lion quitted his prey and fell upon a little Irish mastiffe.'

THE TIGER

The tiger is also mentioned in Abul Fazl's chapter on the Fauna of Hindustan as being plentiful. He describes several methods of hunting the animal, the following of which were most commonly employed:—

1. Cage with sliding door and goat bait.

¹ *Jehangir*, vol. i. p. 350.

² *Ibid.*, p. 371.

³ *Indian Painting under the Moguls*.

⁴ 'Sir Thomas Roe's Voyage to India,' *Pinkerton's Voyages*, vol. viii. p. 14.

2. Poisoned arrows from bows set on trees on the tiger's path.

3. Bait surrounded with glued straw in which the tiger got more entangled the more he attempted to extricate himself, till at last the hunters came up and finished him off.

The faithful Abul Fazl adds that 'His Majesty (Akbar) from straightforwardness, dislikes having recourse to such tricks and prefers with bows and matchlocks openly to attack this brute which destroys so many lives.'

Yet another method, apparently not in common use is thus described: 'An intrepid experienced hunter gets on the back of a male buffalo and makes it attack the tiger. The buffalo will quickly get hold of the tiger with his horns and fling him violently upwards, so that he dies. It is impossible to describe the excitement of this manner of hunting the tiger. One does not know what to admire more, the courage of the rider or his skill in standing (?) firm on the slippery back of the buffalo.'

The killing of a man-eater by Akbar in the neighbourhood of Ajmer in the year 1572 is thus recorded in Abul Fazl's picturesque words: 'On the way the scouts reported that there was a powerful tiger there that always lay in wait for travellers and killed them. Inasmuch as the extirpation of causers of evil is one of the duties of sovereignty, the prince went forward to destroy him, and did so.'

THE LEOPARD OR PANTHER (*Felis pardus*¹)

Abul Fazl mentions this animal as occurring in the Sarkar of Kashmir where it was tracked. It is possible that the Snow Leopard is referred to. The tracking of this animal in the snow is still considered very good sport.

¹ *Panthera pardus*

² *Acinonyx jubatus*

In the chapter on the Fauna of Hindustan, the animal is stated by the same author to be 'numerous'.

Jehangir relates that on his return march from Kabul, from one of his periodical tours of inspection, a female panther (*yuz*) fell into their hands in the course of a hunt between the Garden of Wafa and Nimlah, in the neighbourhood of Jelalabad. 'The zamindars of that place,' he continues, 'Laghmanis, Shali and Afghans came and said that they did not remember, nor had they heard from their fathers that a panther had been seen in that region for 120 years.'

THE CHEETAH OR HUNTING LEOPARD (*Cynaeulrus jubatus*)

The Moghul emperors were extremely fond of this animal, large numbers of which were kept at court for hunting purposes.

With regard to the capture of cheetahs, Abul Fazl observes: 'The ordinary pitfalls were liable to injure the animals severely and sometimes these managed to jump out and get away. Akbar invented a special sort of trap-door which closed when the cheetah fell into the hole. This pit was three gaz deep (about eight feet). Falling through the trap-door the animals were never hurt. On one occasion seven leopards—six males following a female—fell into a pit of this kind.'

Akbar was said to be able to train wild cheetahs in a much shorter time than was ordinarily required, and Abul Fazl relates an instance where 'a newly captured cheetah followed the emperor about without collar or chain to the astonishment of his court.'

The following account of a hunt with cheetahs is interesting inasmuch as it conveys some idea of the depth of interest Akbar took in this form of sport. Abul Fazl writes that '...at

the time the army was encamped at Sangarir. His Majesty according to custom engaged in hunting. He was at this much devoted to hunting with cheetahs, and assigning cheetahs to numerous parties, he went off himself with some special attendants. It chanced that they loosed a special cheetah called "Chitr Najan" at a deer. Suddenly there appeared in front of them a ravine which was twenty-five yards (gaz?) broad. The deer leapt into the air to the height of a spear and a half and conveyed itself across. The cheetah in its eagerness took the same course, cleared the ravine and seized the deer. On beholding this astonishing occurrence the spectators raised a cry of amazement and there was great rejoicing and astonishment. The khedive raised the rank of that cheetah and made him chief of the cheetahs. He also ordered that as a special honour, and as a pleasure to men, a drum should be beaten in front of the cheetah.'

Fr. Monserrate, a Jesuit, who sojourned at Akbar's court for a considerable time refers to the Emperor's love for this form of sport and to the method of hunting, in the following words: 'Zelaldinus (Jelaluddin Akbar) spends enormous sums in keeping countless hunting panthers, for hounds such as those of the Gallic and Alan breeds are unknown in this country. The panthers are drawn by horses under care of the keepers to the place where the game is feeding. They are blindfolded so

that they may not attack any one on the way. When they are freed they dash ravenously upon the quarry: for they are kept in a state of starvation.'

Speaking of the various kinds of animals in the albino phase that had come under his notice, which included hawks, quails, flying squirrels, black buck, chinkara and others, Jehangir mentions a white cheetah which was brought to him at Agra by one Raja Bir Singh Deo. He states that he had never seen a white cheetah before and describes the animal thus: 'Its spots which are usually black were of a blue colour, and the whiteness of the body was also inclined to bluishness.'

The breeding of a pair of cheetahs in captivity is recorded by Jehangir in the year 1613. This is a valuable record: Blanford¹ says that they do not breed in captivity. 'It is an established fact,' writes the Emperor, 'that cheetahs in unaccustomed places do not pair off with a female, and my revered father (Akbar) once collected together 1,000 cheetahs.² He was very desirous that they should pair, but this in no way came off. At this time a male cheetah, having slipped its collar, went to a female and paired with it, and after two and a half months, three young ones were born and grew up. This has been recorded because it appears strange.'

Writing in the time of the Emperor Aurangzebe, the traveller Mons. de Thevenot³ states: 'There are a great many Forests about Ahmedabad where they take panthers for hunting, and the Governor of the Town causes them to be taught that he may send them to the king. The Governor suffers none to buy them but himself, and they whose care it is to tame them in the meidan where from time to time they stroke and make much of them that they may accustom them to the fight (?) of men.'

¹ Fauna British India (1890).

² The *Iqbal Nama* (p. 70) has 9,000. It says that Akbar was so keen on their pairing in captivity that he even allowed some cheetahs to run about in the gardens without collars, letting them walk about and hunt after their fashion, but all to no purpose.

³ *Travels into the Levant*, licensed December 2, 1686.

THE ELEPHANT (*Elephas maximus*)

Of all the animals Babur found in his new kingdom, the one that appears to have excited the utmost wonder and amazement in himself and his Tartar hordes was the elephant. It is possible that neither he nor his followers had ever beheld an animal before of such gigantic proportions, possessing such power behind his push, such a faithful ally in battle, and withal so tractable and docile. All of Babur's descendants shared with him this special regard for the elephant, and it has always figured prominently in all their State functions, peaceful and otherwise.

Babur thus describes the animal: 'As for the animals peculiar to Hindustan, one is the elephant. The Hindustanis call it Hathi which inhabits the district of Kalpi¹ and the higher you advance thence towards the east, the more do the wild elephants increase in number. That is the tract in which the elephant is chiefly taken. There may be thirty or forty villages in Karran² and Manikpur³ that are occupied solely in the employment of taking elephants. They account to the Government for the elephants that they take. The elephant is an immense animal and of great sagacity. It understands whatever you tell it, and does whatever it is bid. Its value is in proportion to its size. When they arrive at a proper age, they sell it, and the largest brings the highest price. They say that in some Islands the elephant grows to a height of ten gaz (25 ft.). I have never in these countries seen one above four or five gaz (10 or 12½ ft.). The elephant eats and drinks entirely by means of its trunk. He cannot live if he loses it. On the two sides

of its trunk, in his upper jaw, he has two tusks: it is by applying these teeth and exerting all his force that he overturns walls and tears up trees; and when he fights or performs any operation that requires great exertion, he makes use of these tusks which they call 'ai' (ivory). The tusks are highly valued by the Hindus. The elephant is not covered by hair or wool like other animals. The people of Hindustan place great reliance on their elephants; in their armies every division has a certain number with it. The elephant has some valuable qualities: it can carry a great quantity of baggage over deep and rapid torrents, and passes them with ease; gun carriages which it takes four or five hundred men to drag, two or three elephants draw without difficulty. But it has a great stomach and a single elephant will consume the grain of seven or fourteen camels.'

Sanderson found by experiment that a full-grown elephant consumes between 600 and 700 lbs of fodder per day.

The measurements given by Babur are also in keeping with actual facts. There is a skeleton of an Indian elephant in the Calcutta Museum which measures 11 ft. 3 in. so that its owner must in life have stood quite 12 ft. in height. This is the largest Indian elephant known.

As regards the sagacity of the elephant, Babur's description falls short of Aelian's who in his attempt to endow the elephant with unusual mental perception, relates that an elephant after carefully watching its keeper wrote after him with his trunk letters upon a board.

Both Blanford and Sanderson agree in believing that the intelligence of the elephant has been greatly overrated, its extreme docility being confounded with intelligence. From a comparison of the development of its brain it

¹ A town of great historic interest on the right bank of Jumna in the Jalaun District. U.P.—*King*.

² A town on the left bank of the Jumna in Allahabad District.—*King*.

³ A town in Partabgarh District. Delhi.—*King*.

is assumed that an elephant is probably of lower intellectual capacity than other ungulates.

Babur had probably never seen a newly born elephant for it is an interesting fact that the young of both the Indian and African elephants have a complete coat of fairly long hair which disappears in a few weeks.

Only once does Babur make an allusion to the sport of elephant hunting. It is doubtful whether this refers to the killing of elephants with bows and arrows or other weapons, or to the trapping of the beasts. Elephant trapping was an ancient practise necessitated by the extreme utility of the captures to the possessors, and Aristotle's descriptions show that the methods of capturing them differed little from those in vogue at the present day. Then as now, tame elephants were used as decoys.

Abul Fazl mentions that 'Garha' is a separate state abounding with forests in which are numerous wild elephants... and again that 'in the Sarkar of Bijagarh there are herds of wild elephants.'

He also describes an elephant hunt from which, it appears that there were several methods employed at the time for capturing these beasts. On the occasion referred to, Akbar's army which was encamped at Gwalior marched to Narwar where the elephant forests were. Arrangements for hunting were made and servants divided into several bodies. To each of them a great officer was appointed and several tame elephants assigned. Strong ropes too were provided for dragging purposes, and in case of need for nooses. An order was issued that whenever wild elephants were found, the tame one should fall with and lose its power of movement from weariness. Then

from each side of the wild elephant, the drivers who were seated on the tame elephants should cast one end of the rope round the neck of the wild elephant and the other round the neck of the tame one. In this way to be brought to captivity and dragged along. Every day they were to tame him more and more and throw fodder before him till they could mount on him. This to occupy a short time. The real method of training every wild animal is gentleness and the exhibition of everything that is agreeable to him, such as grass, grain and water. On rational grounds this mode of hunting seems to be the best plan for hunting elephants: for the wild elephant is great of body and powerful, and is subdued by elephants more powerful than or like himself, the hunters avert his malignity from themselves and gain the victory over him....

The historian recounts that on the third day of this hunt, as Akbar was on horseback at early dawn, he came across a herd of over seventy elephants. These were ordered to be driven into a dense forest where the foot of each was secured to a tree. Watchers were stationed over each animal till the tame elephants with ropes arrived from camp, when under Akbar's direction the elephants being firmly bound each between two of the royal elephants, were conveyed to the camp by evening.

Abul Fazl enumerates the methods of capturing elephants as under:—

1. Kheddah. This method was practically the same as now employed.

2. Chor Kheddah. Here a driver lay flat on the back of a tame female which was driven into a herd of wild elephants. The driver secured a wild one by throwing a rope round its foot.

3. Gadh—Pitfalls.

4. Bar.

¹ Ancient capital of the Gond dynasty of Garha of Mandla—*Imp. Gazetteer*.

Regarding the last he states: 'From times of old people have enjoyed elephant hunts by any of the above modes. His Majesty has invented a new manner which admits of remarkable finesse. In fact all excellent modes of hunting are inventions of H.M. A wild herd of elephants is surrounded on three sides by drivers, one side alone being kept open. At it several females are stationed, from all sides male elephants will approach to cover the females. The latter then gradually go into the enclosure whither the males follow. They are now caught.'

With regard to the period of gestation and the birth of an elephant, Jehangir records: '... a female elephant in the private elephant stud gave birth to a young one in my presence. I had repeatedly ordered them to ascertain the period of their gestation; at last it became evident that for a female young it was eighteen months and for a male nineteen months. In opposition to the birth of a human being, which is in most cases by a head delivery, the young elephants are born with their feet first. When the young one was born the mother scattered dust upon it with her foot and began to be kind and pet it. The young one for an instant remained fallen and then rising made towards its mother's breasts.

The following account of a hunt given by Jehangir is interesting more particularly in the fact that the locality where it took place has long since gone out of the wild elephant's range of distribution. Writing from camp at the village of Sajra (Sajwara?), eight kos from Dohad, now in the Panchmahals District (Bombay Presidency), the Emperor says: 'I went to hunt elephants with a body of my servants. As the grazing place of elephants is in a hilly country, with elevations and depres-

sions, a passage is obtained with difficulty by one on foot. Before this, a large body of horse and foot had surrounded the jungle after the manner of a qamargah, and outside the jungle on a tree they had prepared a wooden platform for me. On all sides of this they had arranged seats on other trees for the Amirs. They had got ready 200 male elephants with strong nooses and many female elephants. On each elephant there were seated two elephant drivers of the tribe of Jarga, whose special employment is the hunting of elephants, and it had been arranged that they should bring the wild elephants from the jungle into my presence, that I might witness the hunt. It happened that at the time when the men from all sides entered the jungle, in consequence of the thickness of the forest and the heights and hollows, the chain was broken and the order of the qamargah did not remain perfect. The wild elephants in bewilderment turned in every direction, but twelve males and females came to this side (i.e. where Jehangir was). As the fear was that they might escape, they drove in the tame elephants and tied the wild elephants up wherever they found them. Although many elephants were not caught at least two excellent ones were captured, very handsome in shape, of good breed and perfect marks. As there is a hill in the jungle where the elephants were, called "Rakas (Rakshas) Pahar" or "Demon Hill"; I called the two elephants "Ravan Sar" and "Pavan Sar", these being the names of two demons.'

The hill referred to is, as suggested by Rodgers and Beveridge, doubtless Pavagarh, a hill-fort in the Panchmahals District which is 2,800 ft. above sea level.

Jehangir left the place while the khedda operations were still in progress, and soon after he mentions that a report was received from Gajpat Khan, Superintendent of the ele-

: *Jeh.*, vol. i, p. 265.

phant stables, and Baluch Khan the chief Huntsman that upto this time sixty-nine elephants male and female had been caught. Whatever took place after this would be reported. I ordered them to beware not to take old or small elephants, but with this exception they should catch all they saw, male and female.'

With regard to the size of elephants Jehangir¹ says, 'In the elephant stables of His Majesty Akbar the largest elephant I saw was "Durjan Sai". It was long the premier elephant. Its height was four yards (dara) and 3½ quarters of the ilahi gaz, which is eight yards and three fingers of the ordinary gaz. At present among the elephants of my establishment the largest athlete is "Alam Gajraj" which H. M. Akbar himself had caught. It is the chief of my special elephants. Its height is 4½ yards (dara) or 7 yards 7 fingers of the ordinary yard. The ordinary gaz (yard) has been fixed at twenty-four fingers' breadths of an average sized man and the ilahi gaz is forty fingers' breadths.'

This would make the height of 'Alam Gajraj' about 11 ft. and that of 'Durjan Sai' about 12½ ft.

Jehangir mentions that one of his private elephants Gajpati by name and a female that was with him in the stables were both bitten on the foot by a mad dog. The symptoms and effects of the bite recorded by him as follows are interesting: He writes, 'When a month and five days had passed after this event, one day when it was cloudy, the growling of thunder came to the ear of the female elephant that was in the act of eating, and it all of a sudden raised a cry and its limbs began to tremble. It threw itself on the ground

but rose again. For seven days water ran out of its mouth, and then suddenly it uttered a cry and showed distress. The remedies the drivers gave it had no effect and on the eighth day it fell down and died. A month after the death of the female they took the large elephant to the edge of a river in the plain. It was cloudy and thundering in the same way. The said elephant in the height of excitement all at once began to tremble and sat down on the ground. With a thousand difficulties the drivers took it up to its own place. After the same interval and in the same way as had happened to the female elephant this elephant also died.' The Emperor concludes this account with 'Great amazement was caused by this affair, and in truth it is a matter to be wondered at, that an animal of such size and bulk should be so affected by such a weak creature.'

Two records of African elephants being brought to India are to be found in Jehangir's *Memoirs* (p. 323). One was a young individual brought as an offering by the Governor of Gujarat to the Emperor Akbar which we are told was very fiery and bad tempered when it grew up. The other was a small elephant presented to Jehangir in 1616 by one Muqarrab Khan which had been brought by sea from Abyssinia. Regarding these Jehangir observes that: 'In comparison with the elephants of Hindustan it presents some peculiarities. Its ears are larger than the ears of the elephants of this place, and its trunk and tail are longer.'

THE GREAT ONE-HORNED RHINOCEROS (*Rhinoceros indicus*²)

Babur, as we know, frequently hunted this animal which he describes as follows:

'The rhinoceros is a huge animal. Its bulk

¹ *Jeh.*, vol. ii, p. 18.

² *Rhinoceros unicornis*

is equal to that of three buffaloes. The opinion prevalent in our countries that a rhinoceros can lift an elephant on its horn is probably a mistake. It has a single horn over its nose, upwards of a span in length, but I never saw one of two spans. Out of one of the largest of these horns, I had a drinking vessel made,¹ and a dice box, and about 3 or 4 fingers' bulk of it might be left.'

'Its hide is very thick. If it be shot with a powerful bow drawn up to the armpit with much force, and if the arrow pierces at all, it enters only 3 or 4 fingers' breadth. They say however, that there are parts of its skin that may be pierced and the arrows enter deep. On the sides of its two shoulder blades and of its two thighs are folds that hang loose, and appear from a distance like cloth housings dangling over it. It bears more resemblance to the horse than to any other animal. As the horse has a large stomach, so has this: as the pastern of a horse is composed of a single bone, so also is that of the rhinoceros. It is more ferocious than the elephant and cannot be rendered so tame and obedient.'²

As regards the distribution of the rhinoceros, Babur says: 'There are numbers of them in the jungles of Peshawar and Hashnagar, as well as between the rivers Sind and Behreh in the jungles. In Hindustan too they abound on the banks of the Saru (Gogra).'

Towards the end of Humayun's reign, in

¹ A span would be equal to 8½ or 9 inches. The record horn of *R. indicus* given in Rowland Ward's *Records of Big Game*, 7th ed. is 24 inches length on front curve or equal to 3 spans of Babur. It will be noticed here how guarded Babur is regarding the measurements he gives.

² In commenting on this Sir Lucas King observes as follows: 'The rhinoceros's horn was supposed to sweat on the approach of poison, a quality which fitted it in a peculiar manner for being made into a drinking cup for an Eastern king.'

about the year 1556, a Turkish admiral of Suleiman the Great, by name Sidi Ali Reis, who by the exigencies of war and weather, had found himself obliged to travel overland from Surat to Lahore and thence across all the intervening lands to Turkey' records that his party came across two rhinoceros near Peshawar, an event' as Mrs. Beveridge observes 'which makes one wonder whether there still remained a part of the ancient lake of the plain of Peshawar to serve as habitat for the huge now vanished beasts.'

Compare the above distribution with the present sadly diminished territories of the animal, which are Burma, Assam and the Nepal Terai, nowhere of which can it be said to be really plentiful, except perhaps in the last named, where owing to its being strictly preserved as Royal Game, the rhinoceros is still to be found in fair numbers. In parts of Assam, too, owing to strict protection, its numbers are slightly on the increase.

The belief in the efficacy of the rhinoceros's horn against poison remained in England even upto the time of Charles II. In his *Science from an Easy Chair*, Sir E. Ray Lankester mentions that at that time a cup made of rhinoceros horn was handed over to the Royal Society for experiment, with the result of entirely disproving the superstition. The belief however, still exists in certain parts of India and in Oriental countries generally. In Tenas-

³ *Babur*, vol. ii, p. 210.

With regard to Babur's comparison of the animal to a horse, Mrs. Beveridge in her translation of the *Memoirs* notes 'The anatomical details by which Babur supports this statement are difficult to translate, but his grouping of the two animals is in agreement with the modern classification of them as 2 of the *Ungulata vera*, the third being the Tapir *F.B.I., Mammals*, pp. 467-8, Blanford.'

⁴ Vambery, *Travels and Adventures of Sidi Ali Reis*, Luzac & Co., 1899.

serim, where both *R. sondaicus* and *R. sumatrensis* are found, the Chinese pay big prices for the horn. The blood, urine and other fluids of the body are likewise preserved and greatly valued. The blood is believed to possess tonic and aphrodisiac properties and sells at about Re. 1 per tola dried. The animal when killed is turned on its back with its feet in the air. The viscera is carefully removed so as not to lose any of the precious fluids, and all the blood, etc., which flow down into the body cavity are scooped out and collected in hollow bamboos, or in the guts of the animal in the form of sausages, and smoke-dried. It is said that a dead rhino is worth anything from Rs. 900 to 1,200 to its hunters. Professional Siamese hunters, presumably having exterminated the rhinoceros in their own country, formed themselves into small roving bands and crossed over into British territory in the Mergui and Tavoy Districts of Lower Burma, and carried on the merciless slaughter of this animal on an extensive scale, and it was on this account that the Government of Burma had to pass legislation to protect it, making poaching a serious offence, and to appoint patrols in areas inhabited by these species.

Writing in the reign of the Emperor Akbar, his chronicler Abul Fazl states regarding the Sarkar of Chambal: "There is game in plenty and the rhinoceros is found. It is an animal like a small elephant without a trunk, and having a horn on its snout with which it attacks animals. From its skin, shields are

made, and from its horn finger-guards for bow-strings, strings and the like." The same author includes this beast in his Fauna of Hindustan where it is described thus: "The rhinoceros is a stupendous creature: he is twice the size of a buffalo, and much resembles a horse in armour. His feet and hoofs are like those of an elephant and his tail similar to a buffalo's, and he has a pastern joint like a horse. On the point of his snout he carries a single horn, and his hide is so thick that an arrow will not pierce it. Of this breast-plates and shields and the like are made, and he is bold enough to charge a man on horse-back."

The above description, as will be noted, closely resembles Babur's account, and may have probably been taken from his Memoirs.

The record Indian rhinoceros shot in Nepal measured 6 ft. 4 in. at the shoulder. A good sized bull buffalo measures 5 ft. or a few inches above.

The Emperor Jehangir mentions that one day he was hunting the rhinoceros from an elephant in the Kul Nuh Ban (Forest) in the neighbourhood of Aligarh. He says "A rhinoceros appeared and I struck it with a bullet on the face (mana) near the lobe of the ear. The bullet penetrated for about a span. From the bullet it fell and gave up its life. It has often happened in my presence that powerful men (*jawanani*) good shots with the bow, have shot 20 or 30 arrows at them and not killed." This took place about the year 1622 A.D. It has been stated that this animal was a wolf, but this is obviously incorrect. In Persian *Gurg* is a wolf and *Kurg* a rhinoceros. A wolf certainly would not require 20 or 30 arrows to kill it.

¹ *Ibid.*, vol. iii.

A Century of Natural History

edited by

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Curator, Bombay Natural History Society

With 12 coloured and 141 monochrome plates
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BOMBAY NATURAL HISTORY SOCIETY
1983

The Two-horned Asiatic Rhinoceros (*Dicerorhinus sumatrensis*)

[1939]

THEODORE HUBBACK

The Sumatran or Two-horned Rhinoceros (*Dicerorhinus sumatrensis*), of Asia, now regarded as a distinct genus, *Dicerorhinus*, the generic title *Rhinoceros* being reserved for the Indian and Java species, was once widely distributed, but owing to continual persecution for the sake of its horn and other parts of its anatomy it has been brought to the verge of extinction.

It is on observations made on this mammal in British Malaya that this monograph is based, but *sumatrensis* has been recorded from India, Burma, Indo-China, Siam, Sumatra and Borneo. Except in Sumatra, where its incidence has not been completely investigated, it appears that in these countries this species of rhinoceros is rapidly disappearing.

No doubt the habits of the Sumatran rhinoceros with local adaptations to different environments, would be much the same in all the above countries; still my ecological remarks must not be taken as applying to other countries than Malaya.

HISTORICAL.

The Asiatic twohorned rhinoceros was, according to Blandford, in his 'Mammalia' in the *Fauna of British India*, first named *Rhinoceros sumatrensis* by Cuvier in 1817. (See *Cuv. Règne An.* 1, page 240, 1817.) I have been unable to ascertain when the first record

was made establishing the fact that there was a two-horned rhinoceros in Asia.

Greek writers described certain animals bearing a single horn and designated one as the Indian Ass. The first Greek writer to mention the rhinoceros was Strabo who wrote just before and after the beginning of the Christian era.

Rhinoceroses were seen in Europe for the first time in 61 B.C. when Pompey the Great introduced them to the games of the Roman circus. Pliny (23-79 A.D.), the Latin writer, mentions the rhinoceros and describes its fights with elephants. But these were probably African animals because those represented on the coins and sculpture of the Romans are shown with two horns and there is nothing to justify us in believing that these may have represented the *sumatrensis*. Marco Polo (1298) appears to have seen rhinoceroses in Java, probably *Rhinoceros sondaicus*, and presently I shall quote what he said about the rhinoceros which provides us with a link between the unicorn and the rhinoceros.

It is well established that rhinoceroses have been known for centuries. The incidents of the unicorn as the animal of fable and the rhinoceros as the animal of fact may have some bearing on the superstitions attached to the rhinoceros. At least one legend associated with the unicorn has been passed on to the rhinoceros. The horn of the unicorn when

Hubback: Twohorned Asiatic Rhinoceros



Mounted heads of the Twohorned Asiatic Rhinoceros *Dicerorhinus sumatrensis* (Cuv.)
— Pahang Federated Malay States *Above*, old male. *Below*, old female
Photos: *Author*

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Hubback: Twohorned Asiatic Rhinoceros



The Twohorned Asiatic Rhinoceros *Dicerorhinus sumatrensis* (Cuv.) shot in steep country
in Ulu Benus, Pahang Federated Malay States

Photo: Author

made into and used as a drinking cup, was supposed to be able to detect poison and we find that even at the present time the same wonderful properties are assigned to the horn of the rhinoceros.

The idea of an animal's horn when used as a drinking cup detecting poison in any liquid placed in the cup is as old as Ctesias, who attributed this virtue to the horn of the Indian Ass, which, I think, must have been some species of Asiatic rhinoceros.

In a note in the 1840 Edition, published by Blackie & Son, Glasgow, of Oliver Goldsmith's *History of the Earth and Animated Nature*, which book, without the notes, was first published in 1774, we find the following in relation to rhinoceroses' horns.

Thurnberg says, "It is generally believed that goblets made of the horns in a turner's lathe, will discover any poisonous draught that is put into them by making the liquor ferment until it runs quite out of the goblet. Such goblets are frequently set in gold and silver, and are regarded as suitable presents to kings, person of distinction, or particular friends; or else they are sold at a high price, sometimes at the rate of fifty six-dollars a goblet. 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; and 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 enclosed in the pores of the horn, and which was now disengaged from it."

'Besides the use of its horns for goblets and handles of swords and daggers, there is scarcely any part of the animal which is not employed medicinally in the countries it inhabits.'

Another legend which long persisted in relation to the unicorn and was apparently also passed on to the rhinoceros was that this normally fierce animal was wonderfully gentle in the mating season, and from that evolved the idea that it became docile in the presence

of a maiden and was lulled to sleep with its head on her breast. This fancy appears in the *Physiologus* which states:—'They send to it a pure virgin all robed. And the unicorn springs into the lap of the maiden and she subdues him and he follows her.'

But Marco Polo would have none of this in relation to the rhinoceros and when describing that animal wrote:—'It is a hideous beast to look at and in no way like what we think and say in our countries, namely a beast that lets itself be taken in the lap of a virgin. Indeed I assure you that it is quite the opposite of what we say it is.'

These superstitions attached to the mythical unicorn and bestowed on the substantial rhinoceros have been responsible for conferring on the rhinoceroses' horns and other parts magical properties resulting in its continual persecution which has brought all species of the Asiatic rhinoceros to the verge of extinction. The two-horned variety has in no way escaped the baleful influences of these illusions.

To come down to more modern times Prince Henri d'Orléans in his book *From Tonkin to India*, being an account of a journey made by him in 1895, records seeing the head of a two-horned rhinoceros in a druggist's shop at Mong-le, a small Chinese town in Yunnan, close to the Tonkin border, in, approximately latitude 22.30N., and longitude 102E. The rhinoceros was alleged to have been killed about four miles away.

Again in the same book Prince Henri records that they found plenty of the spoor of rhinoceroses in the valley of the Nam-Tsai, near Assam. The rhinoceroses' trails must have been numerous because Prince Henri writes, 'We had to thank the latter (rhinoceros) for many an enlarged path and flattened bank.' He also stated that their guide Poulanghing explained that these were the tracks of the

two-horned rhinoceros and that their flesh was good. This was in the Singpo country, approximately latitude 27.30N., and longitude 97E.

In view of what R. Lydekker wrote in his book *The Game Animals of India, Burma, Malaya and Tibet*, 1907 edition, regarding an unidentified species of two-horned rhinoceros which he suggested might be found in the Singpo country, this record is interesting. These two notes by so accurate an observer as Prince Henri show that the two-horned rhinoceros extended over a large area of country directly south of the Chinese and Tibetan borders, and as we know it is still to be found in Sumatra and Borneo no doubt in days gone by its distribution was very wide.

Henri Mouhot, the distinguished French Naturalist, in his book *Travels in Indo-China*, published in 1864, refers in Volume II to a rhinoceros hunt at which he was present in the Laos country, somewhere east of Luang Prabang, approximately in latitude 21N. and longitude 103E. There is an illustration accompanying this account which was drawn by M. Janet Lange from a sketch by M. Mouhot, but the animal depicted is obviously a *Rhinoceros sondaicus* and not a *Dicerorhinus sumatrensis*, the single horn and the fold across the back of the neck being clearly depicted. This is not very far from where Prince Henri d'Orléans recorded having seen the head of a two-horned rhinoceros in a druggist shop, and approximately six degrees of longitude east of the Singpo country. This indicates that at the time of M. Mouhot's journeys there were probably two species of rhinoceroses to be found in Indo-China and Northern Siam and this also may have a bearing on Lydekker's 'Singpo' rhinoceros.

The Asiatic two-horned rhinoceros has from time to time been divided into two or more species, *sumatrensis* and *lasiotis* being amongst

them. Blanford in his *Mammalia* in the *Fauna of British India* discusses these species and gives the reasons for their designation. He inclines to believe, however, that there is only one species but possibly more than one variety. This is supported by modern nomenclature. In the latest edition of Rowland Ward's *Records of Big Game* it is suggested that there are two local races, one *lasiotis*, embracing Assam to Borneo, and the other *blythi*, the race found in Tenasserim. It is doubtful whether the latter race would vary from that found in Malaya although the Malay Peninsula, if *Records of Big Game* is to be followed, holds *lasiotis*.

Lydekker, in his *Game Animals of India, etc.*, 1907 edition, refers to even more than two varieties and suggests that the Malayan animal should be known as *R. sumatrensis niger*, but his premises are, to my mind, incorrect so far as the colour of the Malay animal is concerned. This I will refer to later on.

In *The Field* of the 23rd October 1915, R. I. Pocock wrote a note on the Two-horned Asiatic Rhinoceros after having seen two recently mounted heads of this rhinoceros in Messrs. Rowland Ward's showrooms in London.

In this note Mr. Pocock remarks on the difference in the shape of the skulls and states that it would be important to ascertain if the difference is sexual as it was obviously not geographically racial the two specimens having been obtained in the same district. It was not sexual both the animals being mature males. In fact I think it extremely unlikely that the female of the *Dicerorhinus sumatrensis* would ever have such massive horns as are shown on these specimens.

Mr. Pocock refers also to the absence of fringes on the ears of these animals. I do not think that any rhinoceros which reaches matu-

rity and lives in the dense thorny jungle of Malaya could hope to save the fringes on its ears, even if it ever had them. I have seen, in Malaya, a specimen of a baby *sumatrensis*, and it had much hair on its body and ears.

PHYSICAL ATTRIBUTES

The *Dicerorhinus sumatrensis* is not a very large animal. I think the maximum height for a male would be about 4 ft. 6½ in. at the shoulder this being the measurement of an old male I obtained in Ulu Benus, Pahang. This beast which was stocky and bulky measured 96 in. in girth directly behind the shoulder and 102 in. in length from the end of his nose to the rump, as near as I could measure it. These measurements were taken on a steep hill side so cannot be considered as very accurate. But I have measured other rhinoceroses and the mature animal, whether male or female, has invariably measured more than 4 ft. at the shoulder. One very old female whose molars were worn right down almost to the gum measured 4 ft. 3 in. in height at the shoulder. The measurements of the horns of this animal are given under No. 4 in the table below.

The colour of the *sumatrensis* which has been mentioned as differing from the variety called *lasiotis* and which Lydekker thought was blacker than the northern variety does not, in my opinion, entitle the subspecies *niger* to be recognized. The colour of the hide of the Malayan variety is a dark grey and the underside of the skin, on the belly, under the forelegs, and in the groin, distinctly shades towards pink. The blackest part of the rhinoceros is the horn; even the head is not so dark as the horn. The tail is bare and short, tufted with sparse hairs. The ears, which have been taken as one of the parts which show a

difference from the more northern variety, have a very short fringe and a few hairs on the inside, but no mature rhinoceros living in the dense jungles of Malaya, behaving in the way they do, could possibly save long hairs on the edges of its ears. The young rhinoceros is hairy but this hair disappears as the animal ages and only very short hairs, almost bristles, are found on most of the exposed parts of the mature body. A young rhino following its mother passed on one occasion very close to some of my men as recounted later, and it was noticed as being hairy. It was not a baby by any means.

There are two very long horns in the British Museum which are labelled as having been produced by *sumatrensis*. These horns, according to Rowland Ward's *Records of Big Game* measure 32½ in. and 27½ in. in length, but the next horn recorded only reaches a length of 15 in. That horn came from the Malay Peninsula. The Datok Raja Kiah of Jelebu in Malaya, who is mentioned later on, told me that he had once obtained a *sumatrensis* whose front horn measured about 20 in. in length, but I am afraid I cannot attach much importance to the measurement although it was probably an abnormally long horn. I think that any anterior horn of a *sumatrensis* which measured over 10 in., and any posterior horn which measured over 5 in. should be considered as above the average. The females have smaller and less rugged horns than the males, and seldom show anything but a small development of the posterior horn. In an old male the whole of the top of the nose both around and in front of the horns becomes a mass of horn and at times may develop small lumps which might almost be called subsidiary horns. I have seen two heads with what were almost third horns, and the illustration of the mounted head of a male *sumatrensis* clearly shows

a small horny protuberance over the left eye. The horn is merely agglutinated hair and as the *sumatrensis* is very fond of rubbing his horn against trees one can quite imagine that rough surfaces may easily become enlarged into embryo horns? The horn never appears to be used as a weapon, the large incisors in the lower jaw being the weapon of defence and offence.

The following are the measurements of the horns of four mounted heads of *Dicerorhinus sumatrensis* obtained in Malaya. Numbers 1 and 4 are illustrated.

	Length on outside curve of horn		Circumference of horn	
	Anterior	Posterior	Anterior	Posterior
No. 1	10½"	6"	18"	16½"
No. 2	9"	broken	22"	14"
No. 3	7½"	4½"	16½"	12½"
No. 4	8½"	1½"	15"	10"

Numbers 1, 2 and 3 are those of males, number 4 that of a very old female with teeth worn right down to the gums.

These measurements can be taken, I think, as typical of the class of horn that was obtainable in Malaya.

The *sumatrensis*, for his height, has a fairly large foot. The greatest measurement of the track of a fore foot that I have recorded was 9½ in. across the widest part which would be to the outer edges of the two lateral toe nails. Measurement of the centre toe nail, in this case, was 3½ in. wide. Another track that I measured of what was a slightly smaller beast was 8½ in. across with a centre toe nail measuring 2½ in. These were all measurements of fore feet. The hind feet are narrower and the toe nails generally slightly longer. The older the rhinoceros the more he digs his toes in when going up hill, which I believe he must

do every day of his life! Anyway he always did whenever I followed him! The result is that his toe nails get shorter as he gets older. The impression of a short but wide toe nail indicates old age. This is in contradiction to the wild elephant which gets down on his heels the older he gets so that his toe nails are inclined to grow longer. The most extraordinary portion of the rhinoceros's external anatomy is his sheath and penis. The sheath points backwards and the result is that when the male urinates he does so behind. This is the only definite clue that can be obtained as to what is the sex of the animal one is following.

The illustration Plate IV shows the sheath and although not very clear it can be seen to hang down like a scrotum. If the male urinates when he is walking or even running he appears to throw his penis backwards and his urine shoots up into the air between his legs. The result is that, when following a track, splashes and drops of urine can be seen on leaves of the bush he has passed through, even up to a height of six feet. One's attention is sometimes drawn to the fact that the animal has urinated, because of the smell which is thus brought so close to one's face. In an article in the *Journal* of the Bombay Natural History Society, volume xxxviii, No. 1 published in August 1935, written by Mr. W. S. Thom on Rhinoceros Shooting in Burma, he states that this phenomenon of urinating on the bushes is done by the female, but I do not think that this is so. I have followed rhinoceroses for too many miles to be mistaken in what I have written above. Several other peculiarities mentioned by Mr. Thom in his article do not correspond with my experience, but I do not wish to criticise further the writings of a very experienced shikari, so I will merely record the deductions I have made from my own observations.

THE TWO-HORNED ASIATIC RHINOCEROS

HABITS AND TERRAIN

In the Malay Peninsula the *Dicerorhinus sumatrensis* was to be found in many parts of the mountainous country and sometimes in the coast belts. The *sumatrensis* is now almost entirely a mountain animal due, I think, to having been driven back from the lower lands. It is, however, very occasionally found some-way from the mountains in foothills or dense low-lying jungle. It lives in the thickest and roughest jungle terrain it can find and that alone, up to this time, has saved it from extermination.

The Datok Rajah Kiah of Jelebu, an old and experienced rhinoceros hunter, who belonged to a type now passed from Malaya, informed me many years ago that he thought when two rhinoceroses were seen together that they were probably mother and calf except on the rare occasions when two came together for propagation purposes. I have on four occasions followed two rhinoceroses. In one case they were mating but on the other occasions when I came across two they may have been mother and calf, because apparently the calf runs with the mother until nearly full grown. The evidence that I have on the latter point is not very convincing, but taken cumulatively it does seem to point to slow maturity and long association with the parent.

The 'To Raja Kiah caught a baby male rhinoceros which he carefully tended and kept for seven years. I did not see it when it was very young but the 'To Raja told me that it was still hairy when he got it. He shot the mother and found the baby near by. At the end of seven years the rhino had grown to a little over three feet in height: obviously not full grown. It was just showing the anterior horn, but there was no sign of the posterior horn. It foraged in the jungle during the day

as it got older, had its own wallows, and returned to the 'To Raja's house in the evening for a feed of rice. When the rice was ready one of the household would call with a loud and shrill, Hoh! Hoh! Hoh! and the rhino would answer from the jungle and come back at full speed for his evening meal. He slept under the house.

I have frequently seen tracks of rhinoceros at least as big as this one following a larger one and I think one may presume that they were mother and calf and that the calf was no longer extremely young. This tends to show that the rhinoceros is a long-lived animal although there is insufficient evidence to be dogmatic about it. The 'To Raja learnt two lessons in connexion with his rhinoceros. He had an offer from another Malay for the rhinoceros but with the usual financial jugglings of such people the 'To Raja was persuaded to part with the young rhino by promises of payment as soon as the purchaser was able to get in touch with his principal who lived some 50 miles away. Foolishly the old man allowed the animal to be taken away. About a week afterwards the would-be purchaser returned with the rhino to the 'To Raja and told him that it was sick and could not proceed any further on the journey. The poor little beast had been dragged along a jungle path, had never been given a chance to wallow, and its skin was cracked in dozens of places. It died shortly afterwards and the 'To Raja had neither his rhino, to which he had been very much attached, nor the money which he expected for it. The two lessons were:— (1) avoid greed, (2) a rhino cannot exist unless allowed to wallow.

As I have written above rhinoceroses have a poor development of the herd instinct and are extremely unsociable. I have followed rhinoceros on foot through dense jungles for

days and days but have seldom come across more than one animal. Although at times I have followed fresh tracks which crossed the fresh tracks of another animal I have seldom known them to join up. On one occasion when following the tracks of two big beasts another one crossed their trail and followed them. So then there were three. But the reason was obvious, because presently we came to a place where two of them had had a tussle and the third had laid down close by, no doubt wondering which of the two was to be her future lord and master. I hoped I was going to see a rhino fight and followed up the tracks but I was disappointed. I came upon some more traces of struggles and then one of them went away and left the two to continue their honeymoon. Perhaps it was the lone male which had intruded into the party and which now took up the running? I do not know, but I do know that the solitary one which I went after, it being easier to deal with one animal than two, was a very old male with his posterior horn broken off. This animal is No. 2 in the foregoing table.

Of all the difficult and exasperating animals to follow through dense jungle the rhinoceros easily takes first place. They invariably go through the thickest undergrowth they can find and deliberately leave a game path to go through, or under, or over, some fallen tree which appeals to their sense of humour, I suppose. They do this normally as recreation when going about their lawful occasions, but when once wise to the fact that they are being followed they excel themselves in ingenuity. Nothing is too difficult for them. I remember once tracking a rhinoceros up a steep hill side in very rough country with many rocks about. We came up to him almost on the top of the hill. He heard us, I suppose, and turned round to face the direction we were

coming from, but carefully put a large fallen tree and a dense thicket of rattan between himself and the line of our approach. We could see nothing, but were suddenly brought up standing by a tremendous snort just in front of us. Then a short rush away from us—cessation of all sound, and another magnificent snort, more like an engine blowing off steam than anything else. This was followed by a shrill squeal, denoting that he had smelt us and away he went crashing through everything. We saw nothing at all. He rushed down a dry gully and when we followed painfully in his rear—by that time he was far away—we found that, when tearing down this dry water course which was full of granite boulders, he had come to a place where the formation broke away to a sheer drop of twenty feet. This did not bother him, he just took it in his stride, nor did the flat slab of granite at the bottom on which he landed check him in any way, he had continued his rush as if nothing out of the ordinary had happened. The drop to this granite bed would have seriously injured if not killed any other heavy animal, but a rhino is the toughest animal on earth. His short leg bones enable him to do these things without much inconvenience. We followed him up for some miles before he stopped, apparently to amuse himself by rubbing his horn against a tree, taking off rather more bark than usual, and kicking up a greater amount of earth at the foot of the tree than is customary. That was the only indication that he remembered that granite bed rock. And so it is always with them. They seem impervious to any physical feeling of discomfort. Their walking powers in bad country are phenomenal. I have often followed up a rhino which has laboriously climbed—I should say we have laboriously climbed—a high mountain merely to go down the other side. A rhino that has been

Hubback Twohorned Asiatic Rhinoceros



The Twohorned Asiatic Rhinoceros *Dicerorhinus sumatrensis* (Cuv.)
passing through a 'salt lick' in Ulu, Pahang Federated Malay States

Photo: *Author*

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Hubback: Twohorned Asiatic Rhinoceros



The Twohorned Asiatic Rhinoceros *Dicerorhinus sumatrensis* (Cuv.). A side view of the animal.
Photo: Author

THE TWO-HORNED ASIATIC RHINOCEROS

scared may do this two or three times during a day without stopping, except to take a quick wallow if he comes across a mud hole, and, at the end of the day, the unfortunate people following him will be perhaps far enough behind him to take two or three days to catch him up. The hunting of rhinoceros by tracking is a very difficult business and, if that was the only way to get them, then the rhino would have been in no danger of extinction. But unfortunately the rhinoceros with all his highly developed senses will continually follow the same game trails, especially near wallows or near salt licks, and it is due to this habit that they have been so persecuted. Even to this day, one finds rhinoceroses' game paths passing alongside some long disused and partially filled-up pit, showing their extraordinary obsession for keeping to and following almost the exact paths which generations of rhinoceroses have used. This has resulted in pits being dug on their accustomed trails by poachers anxious to obtain their horns. I have described the procedure later on.

When travelling through the jungle on their ordinary rounds rhinoceroses move slowly and steadily covering a great deal of ground during the twenty-four hours. But occasionally finding some particular patch of jungle that he likes, a rhinoceros may hang about in the vicinity for some days. They particularly favour the heads of narrow valleys, where they generally have well used wallows, plenty of thick undergrowth and nice precipitous sides to the valley to give them plenty of exercise. An ideal place for a rhinoceros to frequent is jungle so dense, that a man can see nothing within five yards except a wall of forest, and so steep that he cannot walk without holding on to something, which something will almost certainly be thorny. Another delightful type of jungle favoured by rhinos is one interspers-

ed with the large bamboo known to Malays as *buloh semeliang* (*Dendrocalamus giganteus*). This bamboo grows quickly and to a great height. Not having much rigidity, much of this bamboo leans towards the ground while still alive and, on steep hill sides, thus presents an almost impenetrable tangle. But the rhinoceros does not bother about this; he goes under the bamboo letting the tangled mass pass over his back. This bamboo fractures easily leaving an edge as sharp as a razor which will cut to the bone with ease. To follow a rhinoceros along a steep hill side where he has passed under *buloh semeliang* is a very ticklish business and if your party gets through without casualties you will have done well. I have seen an elephant's trunk cut very severely by one of these bamboos when he was rushing down a hill after getting a taint of human scent. But they do not bother the rhinoceros; in fact, nothing, except human scent, seems to worry them. They go about their business without fuss or haste.

To follow rhinoceroses with the hope of making observations or watching their movements is extremely difficult and few opportunities ever come one's way.

There was an old rhinoceros in a very remote part of the Malayan jungle of which I wanted to make an intensive study. I tried to. I followed on his fresh tracks for an accumulative period of forty days, spread over five separate expeditions after him. I heard him three times, was very close to him several times but saw him never. His habits were fairly regular until he became alarmed and then he was the cunningest thing in the jungle. The country he frequented was not high but extremely steep and covered with thorns of many sorts. The worst obstruction was a palm called by Malays *chuchor* (*Calamus castaneus*). It grows in dense clumps to a height of about ten feet.

smoothed over all the rocks in the vicinity of a lick.

Rhinoceroses also visit mud-licks which show no exudation of sulphur but probably contain some trace of sulphur or possibly a saline which attracts them. There is I think no doubt but that wild animals visit salt licks for the purpose of cleansing their stomachs and intestines of parasites. Wild cattle droppings will be almost pure mud after a visit to a mud-lick, and I have often come across the dung of elephants slimy and covered with mucus after a visit to a salt lick.

SENSES

The senses of hearing and smelling in *Dicerorhinus sumatrensis* are extraordinarily acute. The enormous nasal cavities surely enhance its power of scent. The habit that this rhinoceros has of curling up its pointed upper lip when testing the wind is no doubt an effort to utilize more of the inner surface of the nostrils in trying to discover the direct line of scent. A rhinoceros, once he has decided that the wind is tainted, wastes no time in getting away and, as I have described elsewhere, he voices his fear in no uncertain manner. I have no doubt but that the rhinoceros relies more on his nose than any other organ to give him warning of danger. His hearing is also very acute, despite the fact that he has small ears which do not look as if they would be capable of catching much sound. The Datok Raja told me that, when approaching a rhinoceros, on no account to break anything along the side of the trail, except the smallest twig, if it was necessary to mark the route, because a rhinoceros could hear so extraordinarily well that he would be put on guard and would immediately start to test the wind in every direction. This is sound advice although a little

difficult to follow along a steep hill side with a thorny rattan holding one back by the lobe of one's ear!

In the dense jungles favoured by rhinos there is little movement in the air, except during a storm, and I have no doubt but that the rhinoceros with his extraordinary powers of smell would detect human scent from almost any direction if sufficiently close to him even on the stillest day. Their sight is poor, in fact probably of little use to them for detection purposes and can be ignored when stalking them.

The rhinoceros has several distinct methods of expressing pleasure, annoyance or alarm and uses both his throat and his nose to give vent to his feelings. It is interesting to know that a rhinoceros when alarmed has a very distinct way of showing his fear as against an extremely truculent demonstration when only suspicious. As I have written already, a suspicious rhinoceros will face the direction where he thinks there is something out of the normal and then give vent to a terrific blast from his nostrils. He may then turn round and trot away a few yards and repeat the performance. It is merely bluff. When he gets a taint of your wind his attitude immediately changes into one of abject fear. Of all animals I think the rhinoceros must hate the scent of man most. Possibly it is due to his being so seldom confronted with it, that to him it is the most horrible smell on earth! Occasionally a rhinoceros when suspicious will turn round and run away without any vocal display, stopping in a short distance to listen intently. It is then very difficult to approach him because he will keep absolutely still and one is liable to almost run into him. But when he gets one's wind the procedure is very different. The animal immediately goes off at full speed in any direction—if facing you he is liable to run

Hubback: Twohorned Asiatic Rhinoceros



A wallow of the Twohorned Asiatic Rhinoceros *Dicerorhinus sumatrensis* (Cuv.) near a 'salt lick'

Photo: Author

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A disused wallow of the Twohorned Asiatic Rhinoceros
Dicerorhinus sumatrensis (Cuv.)

Photo: Author

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straight in your direction—making a noise something between the bark of a dog and the quack of a duck. It is not exactly a squeal but a noise peculiar to a thoroughly alarmed rhinoceros. The intensity of the quacking will generally indicate the distance he will go before he slows up. When hunting in the mountains, I used to despair when I heard a rhino rush away making a series of long and plaintive quacks, knowing perfectly well that it would be days before we would be able to catch him up. On the other hand, if alarmed, he snorts violently and then rushes off; but he will nearly certainly pull up within a hundred yards or so, probably wondering what had disturbed him.

When feeding and quite undisturbed a rhino will continually squeak and talk to himself making some of the noises through his mouth and some with his nose. These noises can be heard for some distance. I have never heard them after a rhino has been disturbed, although followed all day. Apparently he only makes these noises when he is completely at peace with everything. There is a peculiar noise that a rhinoceros makes when in a wallow. This is a quite distinctive sound and not at all like a rhinoceros. The first time I heard it I was with the old Datok Raja and we could hear a rhino splashing about in a wallow but could see nothing. Presently I heard a noise which I took to be made by a monkey, probably a gibbon I thought. I whispered to the Datok that there was a monkey evidently close to the wallow who had spotted the rhino and that we must be careful that he did not spot us too. The old man smiled and shook his head. 'That is the rhino; they make that noise when enjoying themselves in a wallow.'

I often heard that noise on other occasions and was often hard put to it to believe that it really was the rhino and not a gibbon. The

sound was low and rather plaintive, something like the low note of a white-handed gibbon, but also with a faint resemblance to a bird. A noise impossible to describe accurately. Finally a rhinoceros will squeal terribly when dying a violent death, not unlike the screaming of the sambur deer under similar circumstances, but an even more distressing sound.

In addition to noises which present some sort of endeavour to express its feelings there is a complete series of snorts and grunts and blowings which the rhinoceros sometimes gives vent to when wallowing, probably due to trying to get the mud out of his nose and eyes. But generally speaking, they do not make much noise when settled down in a wallow for a good rest. When lying down on the ground, and probably also in a wallow, they never, I believe, lie on their sides, but fold themselves up with their legs tucked under them.

FOOD

I do not think that *Dicerorhinus sumatrensis* ever graze; I have never seen any evidence of them doing anything of the sort. They eat fallen fruit and so far as that goes do take food off the ground but do not appear to eat grass or roots of any sort. Their principal food is the small branches of certain trees, and bitter or astringent fruits. I have once seen a rhinoceros eating lichen, or possibly some fungus off a fallen tree, but their main food supply is from young trees that they break down. Whereas the other species of large wild life in Malaya will often find food in secondary jungle, the *sumatrensis* invariably feeds only in virgin forest or very old regenerated jungle. They seem to feed indiscriminately, that is to say they do not appear to have any regular hours, although they do frequently

sleep during the heat of the day. They may however wallow at any time.

Rhinoceros are particularly fond of trees of the SAPOTACEAE family, some of which are enumerated below. Other trees and fruits which they eat are included in the following list. The native name is given in brackets.

Trees and Fruit eaten by
Dicerorhinus sumatrensis

ANACARDIACEAE. *Mangifera* sp. (Machang berlawin) fruit eaten.

APOCYNACEAE. *Dyera* spp. (Jelutong).

EUPHORBIACEAE. *Sapium baccatum*. (Memaya).

GUTTIFERAE. *Garcinia* spp. (Kandis); *Kayea kunstleri* (Gaha).

LEGUMINOSAE. *Pithecolobium* sp. (Keredas); *Saraca* sp. (Tengelan), flowers eaten.

MYRISTICACEAE. *Myristica* spp. (Penarah).

MYRTACEAE. *Eugenia* sp. (Kelat merah, kelat kuning, etc. etc.).

RUBIACEAE. *Urophyllum* spp. (Manai badak, manai pahit, manai rumpah).

SAPOTACEAE. *Palaquium* and *Payena* spp. (Nyatoh, several varieties); *Payena costata* (Mengelut or Salut), fruit eaten; *Palaquium gutta* (Taban merah, etc.).

Of the many species of *Eugenia*, which are common in the virgin forests of Malaya, young trees are often broken down and the smaller branches and leaves eaten. Many trees containing gum or getah are favoured by rhinoceroses. *Jelutong* seedlings they are fond of. The gum from large *jelutong* trees is the principal ingredient of chewing gum. The several species of the shrub *Manai* which grow in patches on hill sides are often eaten down by rhinoceroses which are very fond of the bitter leaves.

The principal jungle fruits that they are fond of belong to the genus *Mangifera*, as well as

the fruit of a tree called *Mengelut* or *Salut* which has a thick sticky creamy juice, no doubt palatable to the rhinoceros. Once when following a *Rhinoceros sondaicus* on the coast of Tenasserim, Lower Burma, I found that the animal had eaten large quantities of the bark of a tree *Ceriops candolleana* which grows in mangrove swamps and in tidal water. It has a bright orange inner bark and it is, I believe, used for tanning. The urine of this rhinoceros was stained bright orange by the juices in the bark and dried on the leaves like small discs of gelatine.

The rhinoceros obtains most of his food by breaking down small trees, pushing against them with his forehead or chest until the tree is sufficiently bent over to enable him to walk it down by pressing the tree under his belly. Sometimes when the tree is fairly large he puts his fore feet on it to bring more weight into play. He may even hold a tree down by standing on it with his fore feet: I have often seen the marks of his toe nails on the trees that have been broken down.

Having defeated the tree, the rhinoceros proceeds to eat the twigs and small branches. He will move round and round the end of the tree continually altering his position during the process of demolishing the leaves and ends of the branches.

A favourite trick of the rhinoceros when feeding is to get a sapling behind his front horn and twist it round and round until it is thoroughly decorticated and covered with mud from his head. I do not know exactly how this is done never having caught a rhino *flagrante delicto*; but it is generally supposed that this is only done by a rhinoceros which has sufficiently long horns to enable it to twist the saplings between the two horns. I found that this was not the case. In one instance I was following a rhinoceros which had twist-

ed a number of saplings but discovered later that it had a very poor and stumpy posterior horn. Also, I believed, for the same reason, that a female rhinoceros could not twist saplings and, when following rhino's spoor and finding twisted saplings, I concluded that I was on the track of a male which had a good horn. I disproved this by finding saplings twisted in approved style by a cow rhinoceros which was accompanied by a calf. I do not now believe that the length of the horns has anything to do with the thoroughness of the twistings and such indications are no guide either to the sex of the animal being followed or the size of the horns.

Another favourite trick of the rhinoceros is to rub his horn against smallish trees and take the bark off. This is frequently accompanied by pawing up of the earth at the foot of the tree and the sprinkling of the surrounding shrubs with urine. In this case there is generally some indication of the type of horn possessed by the rhinoceros: an old rugged horn will knock large chunks of bark off; a young horn will merely plane the bark off. Much disturbance in this way to the tree and the ground around it will almost certainly indicate a male rhinoceros. I think that the pawing up of the ground may show that there is some sexual connexion between the rubbing of the horn and the disturbed earth which is spread about in all directions, no doubt some of it being directed against his sheath. Female rhinos do rub their horns against trees in a similar fashion but I have never noticed that it has been accompanied by pawing.

GENERAL OBSERVATIONS

Rhinoceros frequently defecate into water but also on land. I have only once seen a place where a rhino had returned to a parti-

cular spot to defecate. Their droppings consist of round balls rather larger than a cricket ball in the case of a mature beast. It is impossible to tell the female from the male faeces. The faeces of an old animal will contain coarse and only partly digested twigs, no doubt due to defective or much worn teeth. Often during the fruit season their faeces are full of the stones of jungle fruits, unbroken but clean of all fibre. Thus does the rhinoceros spread trees, useful to himself and other animals, throughout the jungle. I have often seen young *Mangifera* seedlings growing out of an old accumulation of rhinoceros dung.

A rhinoceros will never defecate in a wallow or a salt lick; at least I have never seen any signs of one having done so. An elephant will defecate in a salt lick and foul the whole place for any other animals, and even seladang (*Bibos gaurus*) are known to occasionally offend in this way.

I am afraid I cannot write much about the young of rhinoceros. I have sometimes come across their tracks but have only once been very close to a rhinoceros calf. All my men saw it but I did not.

We were looking for the tracks of the old rhinoceros mentioned earlier and had been following along a game trail on the top of a narrow ridge. The ridge dipped and then climbed again. I was ahead with one man, and some way behind were six Malay carriers and behind them six Sakai, the aboriginals of the Malay Peninsula. Presently we crossed a fresh track of what was obviously a large rhino. The lateral toe nails were far apart and I mistook the track for that of the old male. The wide spreading toe nails of this rhinoceros should have indicated to me that they were the tracks of a big female and not those of the old male I was looking for. I had noticed this trait before and think that it is due to the

result of an ageing body and flabby muscles of the foot, which may not be so pronounced in the male. I think the track of a large splayed foot may be taken as an indication, but only an indication, when following the spoor of a *Dicerorhinus*, that the animal is a female. The tracks were very new and I sent my companion back along the trail to stop the carriers, natives cannot restrain their chattering and I did not want them to upset the whole business. While my man was on his way back, I heard directly below me the breaking of a tree and then the swishing of some branches. That was the rhino. I started to move nearer the edge of the ridge but before I had gone five yards the rhino became aware of my presence and rushed off. I was well above it and the wind should not have played me such a dirty trick. The animal made a low squeaking noise and ran back towards where my men were. Soon I heard weird noises and then cries of alarm from the Sakai. It all happened too quickly for any of the men to realize what was happening. I had not far to go to find them. The rhinoceros, which was a female followed by a calf, had run right between them. I heard stories of bravery which, knowing their characters, astonished me!

Apparently the rhinoceros having got my scent rushed back more or less on the level until it came out on the game path just in front of my Malays who were plodding along the narrow ridge. The rhino had nowhere else to go so just carried on. The men who had stopped, having heard something coming towards them through the jungle, scattered to each side of the ridge, no doubt looking for suitable trees to climb, but before they could do anything the rhino had passed. The same thing had happened to the Sakai who had rather more time being a hundred yards in

the rear and some of them were up trees when the rhino passed them.

What interested me was the calf. I questioned the Malays and Sakai very closely regarding the position of the calf, and those that observed anything more than the bole of a tree told me that the calf was so close to its mother that its head was almost entirely hidden between her hind legs. I extracted this information when inquiring if they had seen whether the calf had any signs of a horn. One of the men said that he distinctly noticed that the calf showed a good deal of hair on it and they all said that the cow proceeded at a slow trot and was blowing hard. They also said, which I confirmed afterwards by examining the tracks, that the calf was not a very small animal.

The route taken by the rhino was a perfectly natural one and was more or less in the direction it was moving when I disturbed it. But had this incident occurred when I was not there it would have been described as a desperate charge and still another story of the ferocity of the rhinoceros would have come into being. The track of the rhino along the ridge showed that she had followed more or less the centre of the path and, for all she cared, the men might not have been there at all. Her main object was to get away from my smell!

I examined the place where the rhinoceros with her calf had been when I disturbed her. There was a wallow there which was very nearly dry but they had been stamping about in the mud. Here the cow had twisted up a small sapling in approved style. My men had noticed merely a small anterior horn on the cow and no signs of a second horn at all.

The tracks of the calf which were very faint on the ridge were very visible in the drying mud of the wallow and were those of

THE TWO-HORNED ASIATIC RHINOCEROS

a young, but not very young rhino. It is very difficult to spot the tracks of a calf, when with its mother, as generally it keeps either just in front and so has its tracks covered by those of the larger animals or follows close behind stepping into the depressions made by the mother's feet. The dung of a calf is hardly ever seen: I saw some on this single occasion. It was near the wallow. Datok Raja told me that the mother covers up the dung of the calf with her own dung, and the only way to find the calf's droppings is by moving those of the cow very carefully to see if there are any small-sized faeces underneath. I give this for what it is worth; native observations of this sort are not of much value.

The rhinoceros has three toes on each foot. The only other animal in the Malayan jungle that has three toes on its hind foot is the tapir. But the tapir has four toes on his fore foot, so its tracks should not be confused with those of a rhinoceros, but when tracking is difficult, and the fourth toe of a tapir obliterated by the track of its hind feet, mistakes can be made except by experienced trackers. The tracks made by a rhinoceros are not easy to follow. Its large spongy feet press down leaves which spring back to their original level and only faint indications may be left by the toe nails. An old track of a day or two may easily be confused with a new track, especially during dry weather. Heavy rain will almost completely obliterate rhinoceros's tracks at times, and it is often terribly disappointing after a long day's tracking to have a night of heavy rain and know that a long, difficult and tiring day is ahead of one until such time as the rhinoceros has reached some spot, probably miles away, when the rain had ceased.

There is one great help to the tracker and that is the rhinoceros's habit of wallowing. His hide is always dirty. As I have written, the only

other animal whose tracks in any way resemble a rhino's is the tapir and an oldish track of a large tapir which had been perhaps partially washed out by rain might easily be mistaken for that of a rhinoceros. Since the tapir never wallows a careful examination of the saplings or trees that the animal has rubbed against will soon show traces of mud or a mud smear if the animal is a rhinoceros.

POACHING

If salt licks have been a benefit to the rhinoceros they have also spelt his doom. Their habit of making periodical visits to salt licks has enabled poachers to set traps for them along the many game trails which lead to these licks. In Malaya, there is little trapping of rhinoceroses done now for the simple reason that rhinoceroses are very few and far between. But a few decades ago there was a regular business done in pitting for rhinos and hundreds must have been destroyed.

I have travelled a great deal through what was once rhinoceros country and have found dozens and dozens of old disused pits. Most of them were in the vicinity of salt licks, but some in places where there were well defined trails.

At one lick I found no less than 18 of these pits and I certainly did not find all the pits that had been dug. They were twenty to thirty years old. So many pits indicate a large rhinoceros population. There are none there now at all, although this is in an entirely unopened part of the country. At another well known salt lick I found eleven old pits, but on one side of the lick I did not make a careful investigation. This lick is still very occasionally visited by rhinoceroses, but every year their visits become less. In this lick I found, a few years ago, a shooting platform recently con-

structed, no doubt with the hope of getting a pot shot at a rhinoceros. At another lick, in quite a different part of the country, about twenty years ago, I found that a fence had been made covering each game trail into the lick and a spring bamboo spear placed so as to command a small opening left in each piece of fence. This was the work of Sakai, an aboriginal predatory tribe who do much damage to wildlife in some places.

The pits, of which I give an illustration (Plate VI), were made with much care, every trace of the activity of man being removed. There was no difficulty in finding where to make a pit, because there were numerous game trails leading to these salt licks and, in the old days, these trails were regularly used. Such a pit is about seven feet deep, nine to ten feet long, and three to four feet wide. It is so constructed that when a rhinoceros falls into it he is wedged between the slightly sloping sides of the pit and thus kept from reaching the bottom with its feet. A big animal would thus be tightly held by its own weight and entirely helpless. The chances of its getting out are very small, unless it fell so that it could get its head into the sides of the pit, when it would probably be able to dig itself out. In the north of the Malay Peninsula, I understand, that the pits used were lined with round jungle rollers of hardish timber so that there could be no question of an animal being able to dig himself out, but I have never seen any signs of any lining to any pit in Pahang where most of the pitting took place. In selecting the locality for a pit hard soil was searched for, and generally the pit was made on the side of a hill along which ran a game path. Every particle of earth removed from the pit is carried away for some distance and no trace of it was left near the spot. I think that this was more to remove the scent from the earth in

which the poachers had been working than to avoid the chance of the rhinoceros noticing a change in the landscape, because the rhinoceros has very poor eyesight. A fascine of jungle saplings would then be made and placed over the pit, the entire place being covered up with earth and leaves until it looked exactly like any other part of the game trail. I do not think that the poachers visited the pits very often, the extreme sensitiveness of the rhino's nose making it imperative that as few visits should be made as possible. But, so long as the poacher was satisfied that his work had been good enough to assure the capture of an animal falling into the pit, that was all he cared about. What did he care for the sufferings of the unfortunate animal? From what I have gathered these wretched animals very often starved to death. Under such circumstances only the horn would be taken and if the animal was an immature one quite possibly there was nothing to take at all.

Although the pit was the commonest and the most deadly way of obtaining rhinoceroses other methods were adopted. A platform made in a salt lick was one, but this was, I believe, a not very satisfactory business because in those days there were no electric torches and a rhinoceros would seldom come into a lick during the day time. The *belantek*, the spring bamboo or steel spear, was sometimes used as I have already mentioned, but the device was not so certain as the pit, although other animals—a deer or a seladang might be thus added to the bag.

The tracking of rhinoceroses was seldom undertaken by poachers, although an experienced hunter, like the Datok Raja, used no other method. In fact he told me that, when persons started pitting in the Negri Sembilan where he lived, he gave up hunting rhino in disgust. He complained bitterly that pits very

soon drove all the rhinos out of the district and described with scorn the methods of people who were only capable of getting a rhinoceros by digging a pit for it.

The tragedy of the whole thing lies in the fact that the *Dicerorhinus sumatrensis*, one of the cleverest, cunningest, sturdiest and most harmless of jungle animals should be driven from the face of this earth by superstition and greed. For years, in Malaya, this rare animal has been protected by laws which being ineffective are merely marks on pieces of paper, with the result that nothing practical has been done to try to save it from extermination.

COMMERCIALIZED SUPERSTITIONS

There has been for many decades in Malaya, a demand for horns and other parts of the rhinoceros due to the fact that Chinese shop-keepers and others have always been willing to pay big prices for such articles. In fact, I have known of Chinese who financed poachers, or at any rate would be willing to give them credit for provisions for a horn not yet obtained.

This stimulated the business and it went on steadily for many years until the *Dicerorhinus* has been brought to the verge of extermination.

In Northern Pahang, the largest of the Federated Malay States, and the least developed, a tremendous amount of destruction was done to the rhinoceros population at the beginning of this century, despite the fact that from 1896 there was a law in Pahang making it a punishable offence for any person, who was not licensed so to do, to capture, kill or wound any rhinoceros. Not that anyone was either licensed or punished. These poachers were not hampered in any way by an enforcement of the law and the inertness of the Government must be considered as a contributory cause for the disappearance of the rhinoceros.

Many years ago, I had the following conversation with an old Malay on the disappearance of rhinoceros from much of the country where we were at the time. I had been for some weeks trying to locate rhinoceroses but without success.

'What,' I said, 'has become of all the rhinos?'

'I do not know,' he answered.

'Do you remember if there were many here during your youth, because there must have been many at some time or other according to the number of game trails I have seen which were obviously made by rhinoceroses?'

'Yes, there were very many when I was a boy. I remember a man, who devoted all his time catching rhinos in pits, coming here with a sack full of rhino's horns. I have not seen a rhino horn now for years, nor do I know where all the animals can have gone to.'

I had my answer.

That the number of rhinoceroses must have been large, if the old man's story is to be believed, is confirmed to some extent by the numerous trails made by them over the country we were talking about. A rhinoceros game path is different from that of an elephant—sometimes of course they use the same paths—being narrower, as the rhino's footprints continually overlap. Thus they wear a deep furrow down the middle of the path when the track is in steep country. I have seen a trail leading down to a wallow which was six to seven feet deep and much too narrow for an elephant to pass along. But the most astonishing trail I ever came across was in limestone country, where the 'sack full of rhino's horns' came from. Here there is a huge limestone massif, 2,000 feet high, which was often circled by rhinoceroses when travelling that way. In this case a trail passed between two large limestone boulders, both of which were well polished for a height of about three feet. These

boulders rested on bed rock.—limestone—and in this bed rock the trail had been worn down a few inches! How many thousands, nay! tens of thousands, of rhino's feet must have passed along that trail?

None pass now, because there are none to pass.

As I have shown in an earlier part of this article, parts of the rhinoceros's body have been used since ancient times for magical rites or as medicine. This has been the main incentive to the hunting and killing of these animals in Asia so as to bring them to the point of extermination. Killing for profit, and large profits in the case of rhinoceroses, will always be fatal to rare species.

In Malaya the rhinoceros's horn is the chief attraction, Chinese being willing to pay as much as £2 (U.S. \$10) or even more per ounce for the horn or part thereof. The dried blood is also a marketable commodity, fetching 5*s*./l. (U.S. \$1) a pound. It is collected and dried on paper, brown paper for preference—it weighs more—then dried over a fire, the resulting blood-soaked paper fetching the above price. But almost all parts of the body are considered valuable medicine of one sort or another, even the contents of the small intestines before they have been evacuated have a value to the medicine seller. The skin, roasted like pork cracknel, is considered a great delicacy. The horn is purchased by Chinese almost solely as an aphrodisiac. I cannot trace when this was first discovered but it is undoubtedly considered now as an infallible stimulant. Whether the effect of taking powdered rhinoceros horn in your tea or other vehicle is psychological or physiological it is difficult to determine, although it is quite possible that the powdered horn has some irritant effect on the generative glands and so produces a sense of virility which is normally not

there. On the other hand, substitutes have been used as the following incidents show. Some years ago throughout Malaya imitation rhinoceros horns were hawked around the country by Chinese vendors who sold them to the Chinese medicine shops which are to be found in every small village. These imitations were good efforts to represent a rhinoceros's horn to anyone who had never seen the real thing, and went like hot cakes. The Chinese medicine shop-keepers knew, of course, that they were not rhinoceros's horns, but the ignorant Chinese labourer who felt the want of something to stimulate his desire, did not.

These imitations were made from buffalo horn and shaped like a rhino's horn.

There was no instance where one of these imitations horns was found in a Chinese medicine shop and displayed alongside a genuine rhinoceros's toe nail; just to show that there was no deception! These were seized by the Police who did not realize the difference between a real and a genuine horn. I saw the Chinese medicine man and asked him what he meant by having in his possession a rhinoceros's horn without a permit. The law requires one to have a permit. He immediately said that it was not a rhinoceros's horn at all. I explained that such was no news to me but he had apparently been selling shavings from this horn as rhinoceros horn and what was he going to do about it? That rather puzzled him. However I switched off on to the rhino's toe nail and he had a perfectly satisfactory explanation for that. However I warned him that he might still be prosecuted for cheating and the nail and horn would be held as exhibits.

Now, to finish this story I should have a string of satisfied or dissatisfied witnesses who testified to the efficiency or otherwise of the false horn. Unfortunately they were not forth-

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Hubback: Twohorned Asiatic Rhinoceros



The Twohorned Asiatic Rhinoceros *Dicerorhinus sumatrensis* (Cuv.)

Photo: Author

Hubback: Twohorned Asiatic Rhinoceros



The Twohorned Asiatic Rhinoceros *Dicerorhinus sumatrensis* (Cuv.)

Photo: Author

coming so the conclusion is incomplete. But the fact remains that this faked horn business was for some time quite a good line for the medicine shop-keepers, so possibly the superstition may be founded and supported on psychology only.

Malays attach all sorts of qualities to the rhinoceroses' horns which are merely childish. One is that a deep seated thorn can be extracted by rubbing the sore part with a rhinoceros's horn; another is that a severe stomach ache or any other ache can be relieved immediately by the application of a rhino's horn to the affected part, and so on. They are never willing to substantiate their claims by a demonstration—the horn is never forthcoming.

Still, these legends persist and so long as they persist and so long as there is no serious attempt to tackle the problem of how to preserve the rhinoceros for posterity, the *Dicerorhinus sumatrensis* is doomed.

In Malaya the *Rhinoceros sondaicus* is on the verge of complete extinction due to these superstitions and the failure of poor efforts to conserve it.

POSTERITY

What will Posterity say of the present generation which has allowed, in many parts of the world, the fatal progress of the extermination of species, while professing an anxiety to save such species for future generations?

Unfortunately in the present state of our civilization those who have most to say are frequently those who know the least about their subject. Wild Life Conservation is no exception to this unfortunate state of affairs as all true conservationists will agree.

Dicerorhinus sumatrensis is on the threshold of a position that will inevitably cause it to disappear. I do not suggest that the last of

its race will necessarily die a violent death but, due to disturbance and lack of proper facilities to enable them to exist under congenial and natural conditions, they will not breed.

The *sumatrensis* is, I believe, a long-lived species, and as such there will be for many years a solitary one or two left in remote places, which the opponents of proper conservation, and there are many of them, will point to as evidence of the adequateness of the futile arrangements, mostly on paper, that have been made for their salvation.

In the new Wild Life Protection Act, 1936, Burma, which might be considered as the last word on Wild Life Protection, the killing, taking, importation or exportation of rhinoceroses or any part thereof, is prohibited, although there is a provision to enable the Local Government to give special licences to do some of these acts for scientific purposes.

This sounds as if the rhinoceros was very well protected but unfortunately a proviso has been inserted in the Act which reads as follows:—

'Provided that it shall not be an offence for any physician or druggist to possess or sell or for any person to possess for private medical purposes rhinoceros blood or any preparation thereof: . . .'

How anyone can become possessed of any part of a rhinoceros when all killing and hunting of that animal is prohibited, when all import of the animal or any part thereof is prohibited, and still keep within the law, seems problematic. Why therefore insert a clause which seems to provide a very large loophole for illicit dealings in rhinoceroses' blood which means dead rhinoceroses?

Possibly the Local Government anticipates the giving of licences to such persons as those mentioned above to possess 'for scientific pur-

these objects will
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 e been responsible for the loop-
 ho Act.

But does not help the preservation of rhinoceroses which are now far too rare to be dealt with in any other way than by complete and adequate protection.

To save them from complete extinction, the only hope that remains for the rhinoceros in Malaya, and I think I may add in Burma, is to constitute inviolable sanctuaries in their own habitat where a suitable environment is

known to exist. These sanctuaries must be properly guarded and freed from human interference and severe penalties should be provided for any breaches of such laws as are enacted to make these places real refuges for the rhinoceroses in them.

There must be no loophole in the Act such as there is in the Burma Act. Whatever superstitions there may be connected with the rhinoceros, it must be recognized that these superstitions have brought all species of the Asiatic rhinoceros to the verge of complete disappearance, and, unless steps are taken to make it practically impossible to continue to commercialize these superstitions, then we must realize that we are impotent to save the *Dicerorhinus sumatrensis* from extinction.