EXTINCT AND VANISHING MAMMALS

of the

OLD WORLD

by

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illustrations by

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that tapirs in the wilds suffer from an eye disease and are often blind." (Ulmer, in Miller, 1942, p. 161.)

Various authors, including De Beaufort (1926, p. 61), extend the Malay Tapir's range to Borneo, while others consider it confined to Sumatra within the Malay Archipelago.

"It is not yet certain that the tapir has been met with in Borneo, although there are persistent reports that an animal of its size and appearance exists in the interior of the country. It would be wise to suspend our judgment for the present and content ourselves with the fact that so far it has only made its appearance on the North Bornean postage stamps!" (Mjöberg, 1930, p. 22.)

Family RHINOCEROTIDAE: Rhinoceroses

Two genera (*Ceratotherium* and *Diceros*), of two forms each, occur in southern and eastern Africa, and from the Sudan westward to Nigeria. Two additional genera (*Rhinoceros* and *Dicerorhinus*), consisting of four or five forms, range from India and Indo-China through the Malay Peninsula to Sumatra and Borneo. Unfortunately, a work of the present scope requires a discussion of every living form of rhinoceros.

Great Indian Rhinoceros; Great One-horned Rhinoceros. Rhinocéros unicorne (Fr.)

RHINOCEROS UNICORNIS Linnaeus

[*Rhinoceros*] *unicornis* Linnaeus, Syst. Nat., ed. 10, vol. 1, p. 56, 1758. ("Habitat in Africa, India" (Linnaeus); "probably the sub-Himalayan Tarai of Assam" (Lydekker, 1916, vol. 5, p. 48).)

FIGS.: Geoffroy and Cuvier, 1824, vol. 2, pls. 306, 307; Gervais, Hist. Nat. Mammif., pt. 2, pl. facing p. 164, 1855; P. L. Sclater, 1876, pl. 95; Royal Nat. Hist., vol. 2, pl. facing p. 464, 1894; Lydekker, 1900, pl. 1, fig. 2; Van der Byl, 1915, pl. 32; Faunthorpe, 1924, pp. 174, 181, figs.; New York Zool. Soc. Bull., vol. 27, p. 72, fig., 1924; Jour. Bombay Nat. Hist. Soc., vol. 37, no. 1, suppl., pl. 31, 1934; Pocock, 1937, p. 709, fig.

With a former range extending from the North-West Frontier Province of India eastward perhaps as far as French Indo-China, this species has more recently become restricted largely or wholly to the Nepal Terai, northern Bengal, and Assam. Its numbers also have greatly diminished.

This is the largest of the Asiatic rhinoceroses, reaching a height of 6 feet 4 inches at the shoulder and a total length of 14 feet 1 inch, with a horn of 24 inches; fold of skin in front of shoulder not continued across back of neck; other folds behind shoulder, in front of and across thigh, and around the neck; sides of body and upper limbs studded with large rounded tubercles; skin naked except for a fringe of hairs on the margin of the ears and some bristly hairs on

the tail; general color uniformly blackish gray, with more or less pink on the margins of the folds (Lydekker, 1900, pp. 21-22).

India.—"In the history of Timur-bec, it is described how in 1398 on the frontier of Kashmir, Timur hunted and killed many rhinoceroses. In the memoirs of Baber it is described how in about 1519 he hunted the rhinoceros in bush country near the Indus. And in the book of Sidi Ali dated 1554 it is stated that rhinos were seen near the Kotal Pass, west of Peshawar.

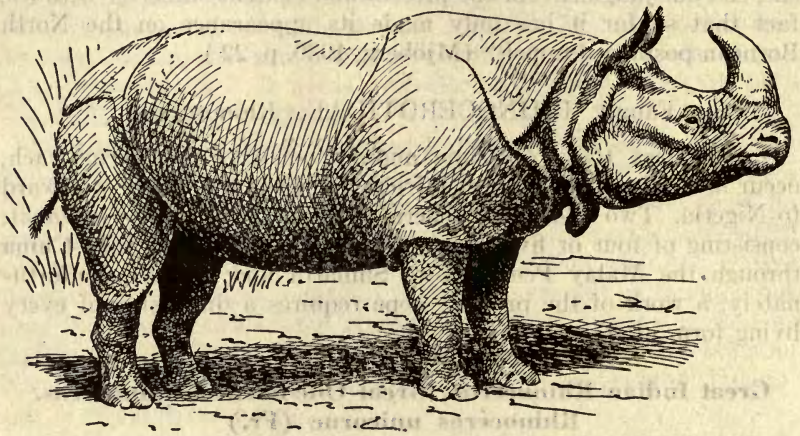

FIG. 40.—Great Indian Rhinoceros (*Rhinoceros unicornis*)

"These references are of interest, for they show that in old times the rhinoceros was plentiful and further, ranged over a great portion of India, whereas it is now approaching extinction." (Hobley, 1931, p. 19.)

"Not improbably . . . the rhinoceroses found till about the year 1850 in the grass-jungles of the Rajmehal Hills, in Bengal, belonged to the present species. Now, however, this huge animal has retreated almost, if not entirely, to the eastward of the Tista valley, on the borders of Kuch Behar; its main strongholds being the great grass-jungles of that province and of Assam." (Lydekker, 1900, p. 23.)

Shebbeare (1935, pp. 1229-1231) gives the following account:

Though this rhinoceros is becoming alarmingly rare everywhere, Nepal and Assam are better off than Bengal, where its habitat is restricted to a few places in the Duars and Cooch Behar State. Here the last main stronghold of the species is a tract of high grass savannah along the Torsa river, stretching from the foothills of Bhutan, through the Duars into Cooch Behar. It is a narrow strip, not more than 40 miles from the north to the south and, at its widest, four miles from east to west—perhaps 50 or 60 square miles. Outside this tract the few scattered colonies can perhaps muster a

dozen individuals in all, but unfortunately these outliers have no spare coverts into which they can expand. . . .

Contrary to what one hears of African rhino, ours is seldom aggressive, nor does he cause havoc to agricultural crops like the elephant.

For the last 25 years in Bengal and Assam rhino have been closed to sportsmen, but this has not saved them from poachers, who shoot them to obtain their horns. From time immemorial these have been highly prized for superstitious reasons. A cup made of the horn of a rhinoceros is still believed to render poison innocuous, a point of some importance to tyrannical rulers, and, when powdered, it is held in the East, especially in China, to be the most potent aphrodisiac. It is believed that most of the horns that are smuggled out of these jungles eventually find their way to China, but however this may be their present value in the Calcutta market is about half their weight in gold. A single horn retrieved from the poachers recently fetched 150 pounds, and still higher prices have been known. That an animal by nature condemned to carry such a price on his nose should tempt poachers is not to be wondered at, but the remoteness of their strongholds, and their armour, too thick to be penetrated by "gas-pipe" guns, was their protection, and up to about six years ago there were probably some 200 animals living in the small tract I have described.

Then poaching began. The first poachers came from Assam, where they had plied the same trade, and brought with them muzzle-loading guns heavy enough to kill a rhino. They were joined by local men of the same tribe (Mechs) and formed themselves into gangs. Their plan was to build a light bamboo staging about 8 ft. above the ground at strategic points, usually where two well-worn rhino tracks met, and lie up when the moon was nearly full. Sooner or later a victim was bound to pass and received a heavy bullet at a range of a few feet . . . . They seldom took more than the horn; to try to dispose of the meat, which, by the way, is excellent eating, would have aroused suspicion . . . . For nearly three years this went on without any suspicion being aroused.

After the poaching was detected, it required six months or more of effort by the Forest Department and the Government of Bengal to stop the poaching. A bill was passed, making the killing of rhino, except in defense of life, an offense.

"Our attempts have so far been successful. Since Christmas, 1931, so far as we know, only one rhino has been killed, and the perpetrators are now in gaol."

The Government of Bihar (*in litt.*, December, 1936) sends the following information: "The Great One-horned Rhinoceros was formerly fairly common in the jungles of North Bihar bordering on Nepal, especially . . . near the Kosi river, and individuals were found until 50 or 60 years ago. The jungles in this area have practically disappeared and the animal is unknown except as an occasional stray visitor from Nepal into the jungles in the North West corner of the Champaran district."

The Senior Conservator of Forests, Bengal, writes (*in litt.*, September, 1937):

"Former range: Jalpaiguri Forests (common) and Riparian Forests of the Buxa Division (no information as to number).

"Present range: 4 or 5 in the Jalpaiguri Forests, 56 in the Riparian Forests bordering the Torsa and Malangi Rivers and wet forests of Kanbari.

"Causes of depletion: in Jalpaiguri Forests: probably shooting and poaching and possibly disease. In the Buxa Division the species showed up to 1932 tendency to extinction due to heavy poaching. Since 1933 they are increasing in number. The horn is worth 8 to 10 times its weight in silver. The hide is also valuable. . . . A Game Sanctuary to the extent of 26 sq. miles is being maintained."

In years gone by, in this general region, the animals were sufficiently numerous or destructive to have called for the establishment of a bounty. "They sometimes will travel long distances to reach rice and corn fields, and do immense mischief, so much so that *there is a Government reward of twenty rupees* to anyone shooting a rhinoceros" (Baldwin, 1876, p. 144).

Nepal.—This species is "decreasing rapidly in Nepal. In the Morang District of the Nepal Tarai this rhinoceros was plentiful not many years ago, but now not a single specimen is, I believe, to be found within two hundred miles." Several specimens were collected in the Gandak Valley in 1923. (Faunthorpe, 1924, pp. 179-188.)

Further information is as follows (Anonymous, 1934, p. 89):

> Along the numerous rivers which flow through the jungles of the Nepal Terai the rhino has particular places for dropping its excreta. Mounds so accumulate in places. In approaching these spots a rhinoceros walks backwards and falls an easy victim to poachers. . . .
>
> The food consists chiefly of grass. In Nepal during the rains Rhinoceros frequently enter cultivation. . . .
>
> In Nepal the flesh and the blood of the Rhinoceros is considered highly acceptable to the *Manes*. High caste Hindus and most Gurkhas offer libation of the animal's blood after entering its disembowelled body. On ordinary *Sradh* days the libation of water and milk is poured from a cup carved from its horn. The urine is considered antiseptic and is hung in a vessel at the principal door as a charm against ghosts, evil spirits and diseases. These beliefs connected with the Rhinoceros are prevalent in varying form in Burma, Siam and China. They set a great value upon the animal and provide the main reason for its persecution. In Nepal, the Indian Rhinoceros is found only in the country to the east of the Gandak river known as Chitawan where strict preservation by the Nepal Government has saved it from extinction.

Twenty to thirty years ago, according to the Bombay Natural History Society (*in litt.*, December, 1936), it "was still common in the Sikhim Terai and in Nepal as far west as Rohilkund."

Arthur S. Vernay writes (*in litt.*, March 11, 1936) on economic conditions:

"I think . . . that there is one mistake he [Shebbeare] has made, that is in regard to the crops being destroyed by the rhinoceros. This is one of the chief complaints which the Nepalese have in the Nepal

Terai. One sees all over the place high bamboo shelters which are built in their cultivations, and these during certain seasons of the year are occupied at night by Nepalese in order to have bells, gongs, and so on, to frighten the rhinoceros away during their night feeding in the cultivations. . . .

"One of the methods of poaching which is being used from time to time is building deep pits into which the rhinoceros falls."

Lt.-Col. F. M. Bailey, of the British Legation, Nepal, writes (*in litt.*, March 16, 1936): "Yesterday I had a talk with His Highness the Maharaja about the numbers of Indian rhinoceros in Nepal. He told me that it was estimated that in 1910 there were about 1,100, in 1930 the number had dwindled to about 100. Very strict measures were taken to preserve them and he told me that he now estimates there must be some 200 and there is every sign that they are on the increase."

Assam.—"This rhinoceros is very plentiful along the Terai and in the Durrung, Nawgong and Goalpara districts in Assam" (Pollok, 1879, p. 95).

"Mr. Shebbeare has taken great pains in an attempt to estimate the approximate number of *R. unicornis* still surviving in Assam (North Bengal). They first occur about 51 miles south-east of Darjeeling and there are sporadic occurrences along the foothills for about 330 miles due east as far as Sibsagar. In this long strip of country he estimates that not more than 220 specimens survive to-day." (Hobley, 1932, pp. 20-21.)

Milroy (1934, pp. 99-101) contributes the following information:

> The two Game Sanctuaries [Monas and Kazirunga] . . . were originally selected for the Great One-horned Rhinoceros . . . , and a very fine stock of these animals was raised as the result of the protection afforded. . . .
>
> The rhinoceros, our most important animal from the natural history point of view, is a difficult species to preserve even though its destruction is forbidden by law . . . . The demand for rhinoceros' horns has always been considerable in India, but of recent years China has also been in the market, consequent on the practical extermination of *R. sondaicus* in Lower Burma, Tenasserim, etc., with the result that a horn is now worth just about half its weight in gold. The prospect of a lucrative business led to an organization being formed for passing on rhinoceros' horns and elephant tusks to Calcutta, and the disturbed political conditions provided the virile Boro tribes (Meches and Kacharies) living near the Monas with the opportunity to take up poaching on a large scale.
>
> The operations of the financiers in the background were checked for the time being; the advent of the Assam Rifles restored order; additional game-watchers were engaged, and an Assistant Conservator was placed in charge of the Sanctuary . . . .
>
> Apart from the two Sanctuaries mentioned previously, the rhino have one remaining refuge, namely the Balipara Political Area. Here some very valuable protection has been afforded to this animal in one area by a planter who is an enthusiastic game preserver.

The Chief Secretary of the Assam Government writes (*in litt.*, June, 1937): "Former range: probably occurred all along the Brahmaputra between Kalangmukh and the present Kaziranga game sanctuary and in a sporadic condition in Sibsagar. Present range: about a dozen in the Laokhowa reserve in Nowgong, about 100 in the Kaziranga sanctuary and adjoining U. S. F. in Sibsagar. Causes of depletion: opening up of the jungle and shooting by poachers . . . . Complete protection under the game laws."

Burma.—The records for this country are not at all satisfactory. Pollok (1879, pp. 95-96) states that rhinoceroses of three kinds are abundant in Burma, the large single-horned species occurring "in the Yonzaleen and Arrakan range, and perhaps the Yomahs." On the other hand, Jerdon (1874, p. 233) had no information as to its extending south of the region adjoining the Himalayas, and Peacock (1933) does not mention it in his book on the game animals of Burma.

Siam.—Its occurrence in this country is doubtful (Hobley, 1931, p. 21, and 1932, p. 20). Flower (1900, p. 366) has no definite record, and Gyldenstolpe (1919) does not include it in his list of the mammals of Siam.

French Indo-China.—The older works do not include this country in the range of the species, and the recent reports probably require verification. De la Chevasnérie (1936?, pp. 340-341) quotes Millet to the effect that *unicornis* extends as far as Tonkin, and he adds (translated):

> It may still be found between the Rivers Da R'Man and Krong Knô, lower branch of the Srépok. Also between the River Song-Quao and the road from Phantiet to Djiring, region of Catot. Also in the massif extending along the right bank of the Song-Phan, from the Nui-Visong to Nui-Bê. Also, according to native report, on the left bank of the Da Nhim above the post of Dran (Lang-Bian) and about two days' journey from the center; the place is called Lieng-Du. Likewise in the region of Tutra (Lang-Bian) near the mountains Mu K'Bay and Cay Ko Mao, in the forest of Mour-Neuill.
>
> While there remain a certain number of *unicornis* in Indo-China, the individuals of the other two species could probably be counted on the fingers, if any survive at all.

The Chief of Veterinary Service, Cochin China, writes (*in litt.*, December, 1936) that it no longer exists in Cochin China.

According to the Résident Supérieur de Cambodge (*in litt.*, November, 1936), different authors indicate that *unicornis* is one of three species found in Indo-China. It is rather possible that one or even two of these species have now disappeared from Cambodia.

Javan Rhinoceros; Smaller One-horned Rhinoceros. Rhinocéros de la Sonde (Fr.)

RHINOCEROS SONDAICUS Desmarest

Rhinoceros sondaicus Desmarest, Mammalogie, pt. 2, p. 399, 1822. ("Sumatra.")
FIGS.: Temminck, Natuurl. Geschiedenis Nederl. overz. bezittingen, Zool., Mammalia, pl. 33, 1839-44; Proc. Zool. Soc. London 1874, pl. 28; Trans. Zool. Soc. London, vol. 9, pl. 96, 1876; Blanford, 1891, p. 475, fig. 155; Lydekker, 1900, pl. 1, fig. 3; Kloss, 1927, pl. 5; Dammerman, 1929, p. 25, fig. 6; Barbour and Allen, 1932, pl. 11; Jour. Bombay Nat. Hist. Soc., vol. 37, no. 1, suppl., pl. 32, 1934; Ward, 1935, p. 338, upper fig.; Loch, 1937, pls. 3, 4.

This is one of the rarest and most famous of the large mammals now facing extinction. The last survivors linger in a few localities in southeastern Asia and the Malay Archipelago.

It is somewhat smaller than *R. unicornis;* color dusky gray throughout; fold of skin in front of the shoulder, like that behind the shoulder and that in front of the thighs, continuous across the back; skin divided by cracks into small, polygonal, scalelike disks; ears with a short hairy fringe; tail hairy below and at tip; single horn of the male reaching a length of a little more than 10 inches; horn generally absent in the female. Height of male at shoulder, 5 feet 10 inches; of female, 5 feet 6 inches. (Blanford, 1891, p. 475; Lydekker, 1900, pp. 25-26.)

The range formerly extended from Bengal, Assam, Burma, Siam, and Indo-China through the Malay Peninsula to Sumatra and Java (*cf.* Loch, 1937, map facing p. 130).

India and Burma.—In the past the species was distributed in the Sundarbans and other parts of eastern Bengal, and through Assam and Burma. It is mentioned as having been once abundant in the forests along the larger rivers of Tenasserim. At present it is practically exterminated from India proper. A few may survive in the North Lushai Hills and in Manipur. It is doubtful if more than half a dozen animals survive in Burma. It is completely protected by law in Burma. Every part of the animal, including the blood and the entrails, is in demand. (Bombay Natural History Society, *in litt.*, December, 1936.)

Shebbeare writes (1935) of its former occurrence along the Torsa River, Bengal: "The Lesser Indian rhinoceros (*R. sondaicus*) inhabited these jungles until at least as recently as 30 years ago, when one was shot by a forest officer." This was "one of the last, if not *the* last, of its race in this locality."

"There have been rumors of the former existence of *R. sondaicus* in the forests of Orissa and about the delta of the Mahanadi River, in the Bay of Bengal. This has been discredited by some authorities

and as specimens have not been seen by Europeans, we have now no means of ascertaining the truth.

"In the Sunderbans delta . . . the last tracks of the animal were seen . . . about 1887 so that by 1890 it had probably died out." (Loch, 1937, p. 132.)

In Bengal the former range included the Jalpaiguri and Chittagong Forests. Extinction was due to poaching. (Senior Conservator of Forests, Bengal, *in litt.*, September, 1937).

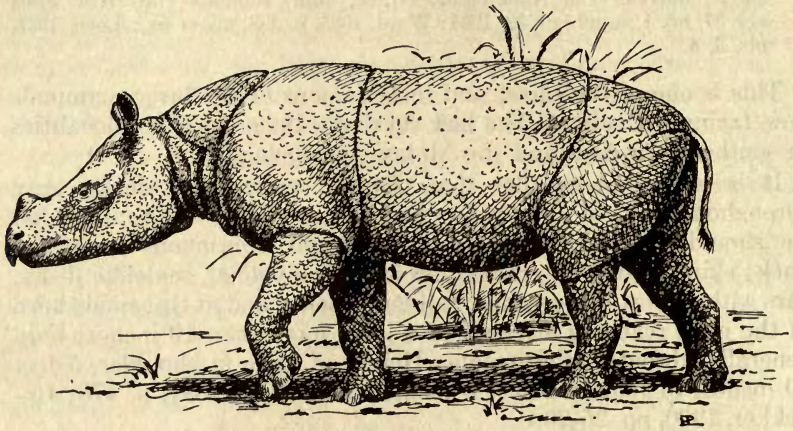

FIG. 41.—Javan Rhinoceros (*Rhinoceros sondaicus*)

Its status in Assam is discussed by Milroy (1934, p. 102): "It is on record that Messrs. Rowland Ward identified the head and shield from a rhino shot by a Forest Officer in the Bengal Dooars as belonging to this species, and it would be strange if it did not also occur in the contiguous Goalpara Reserves and Monas Sanctuary. Pairs of smaller, less truculent, and definitely less armoured rhino can be put up in the Sanctuary and these, if not cases of *R. unicornis* pairing while still far from mature, must be specimens of *R. sondaicus*."

Loch (1937, p. 132) quotes Pollock (1900) as follows:

"It is fairly plentiful on the left bank [of the Brahmaputra] South of Goalparah, where I have killed it.

"I may here mention about them in Assam . . . that I shot there forty-four to my own gun, and probably saw some sixty others slain, and lost wounded fully as many as I killed."

On this Loch comments (p. 133): "The latter paragraph, no doubt, refers to all species of rhino. Colonel F. T. Pollock spent seven years, in the '60s, in Assam, and was an accurate observer and keen shikari. If one European can, in seven years, account for so

many little wonder that the Javan-rhinoceros is now extinct in the country."

Peacock (1933, pp. 77-79) says:

> In Burma, there is no authentic record of its shooting, except in one instance, viz. a specimen shot . . . some years ago . . . in the Mergui District in southernmost Burma. . . .
>
> The Javan rhinoceros has been shot illicitly on numerous occasions by professional hunters and poachers: in fact, it has now been poached almost out of existence. . . .
>
> It is open to question whether the Javan rhinoceros ever existed outside of the Thaton, Salween and Mergui Forest Divisions in Lower Burma. The only definite records of its existence come from these three Divisions.
>
> The best-known grounds used to be the forests of the Victoria Point Subdivision in the Mergui District. Although, as Divisional Officer in charge of the Mergui Forest Division, I spent four months in touring through that Division, I could find no evidence of its existence outside of the Victoria Point Subdivision. . . .
>
> The forests of the Victoria Point Subdivision undoubtedly held, at one time, a very fair number of Javan rhinoceros, but these have long since been poached out of existence for the sake of the valuable horn and blood which realize an even greater price than that of the Sumatran rhinoceros. . . .
>
> It is extremely doubtful whether there are now more than half a dozen specimens of *R. sondaicus* in existence in Burma, and it is unlikely that they will survive.

This is the most threatened mammal in Burma. It "is now, so far as known, confined to the Kahilu Game Sanctuary in the Thaton Forest Division of Lower Burma. This Sanctuary was formed with the chief object of affording shelter to these rhino which are believed to number six specimens. No death has been reported since 1931 and there are grounds for believing that these rhino will be saved from extinction. Hunting prohibited. In the past ruthlessly persecuted for the sake of the blood which is claimed to have medicinal properties." (Game Warden, Burma, *in litt.*, November, 1936.)

"In a letter received from the Forest Department, Shwebb, it stated that four specimens of the Javan rhinoceros probably occur in the Kahilu Game Sanctuary. This is located in the Thaton and Salween Districts, in Lower Burma. In the Shwe-U-Daung Game Sanctuary in Upper Burma, it is hoped that a few may exist but it is unlikely." (Loch, 1937, p. 133.)

Siam.—Flower (1900, pp. 366-367) records a specimen brought to the Siamese Museum in 1897, apparently from the Laos Country. He also remarks on the eagerness of the volunteer skinners (mostly Siamese women) to secure the blood, flesh, and bones.

In his notes on *R. sondaicus* and *R. sumatrensis* in Siam, Gyldenstolpe (1919, p. 170) confuses the technical and the common names of the two species, so that it is difficult to allocate the notes to the right species. Both animals, however, were evidently rare at that time.

In 1931 total protection was recommended by the Siam Society.

"Of its occurrence in the Siamese part of the Malay Peninsula we have practically no evidence" (Kloss, 1927, p. 207).

Loch (1937, pp. 133-134) quotes William W. Fegan (1933) as follows:

> I may state that both the one-horned and two-horned rhinoceros (*R. sondaicus* and *R. sumatrensis*) are to be found in Siam but, owing to the hunting by the hill tribes both are now extremely rare . . . .
>
> As to the one-horned, I have been thirty-three years in this part of the world and have travelled over the major part of Siam and I have never yet met a man, native or European, who has shot one. Some twenty years ago two Europeans, surveyors, in the hilly district near the Three Pagodas, on the Siam-Burma frontier, tried to bag one but failed. It was later on trapped in a pitfall by the neighbouring tribesmen and I saw the horn and strips of the skin which were brought to a place called Kanburi.
>
> In more recent times I have heard of two of the animals having been seen in Eastern [= western] Siam, near the Meklong, but know nothing more about them. A Siamese official who had spent some years in this district told me that he had heard of the existence of seven or eight and he knew personally of two of them having been killed. The question of how many of the animals remain alive to-day in Siam is rather a mystery . . . . About the year 1886 a one-horn was captured and brought alive to Bangkok from a place near Krabin, to the west of the capital.

Loch adds that a few years ago A. S. Vernay could get no information as to the animal's presence in central and northwestern Siam.

French Indo-China.—Information on the status of the two species of rhinoceros occurring in this country (*Rhinoceros sondaicus* and *Dicerorhinus sumatrensis*) is so imperfect that in some cases it is virtually impossible to segregate the records of one species from those of the other. The following notes probably refer in part to both species.

Rhinoceroses have certainly become very rare in Indo-China, if indeed a single one is left. In South Annam Defosse succeeded, about 1903 or 1904, in killing five. About 1896 M. Oderra killed 25 Rhinos; M. de Monestrol certifies to this. (De la Chevasnérie, 1936?, p. 340.)

In Cambodia the disappearance of rhinos is almost complete at present. They were formerly recorded as very rare in the Massifs de l'Elephant and des Cardamomes, and on the banks of the Mekong. A specimen was killed about 1930 in the Province of Kompong-Cham. Some may still exist, but in very sparse numbers, in the region of Sré-Umbell (Kampôt) and in the Province of Stung-Treng. The number must be very small (probably less than a dozen). It is impossible to determine the exact species. Various authors have recorded *sondaicus, sumatrensis,* and *unicornis* from Indo-China. It is quite possible that one or two of these species have

completely disappeared from Cambodia. (Résident Supérieur of Cambodia, *in litt.*, November 20, 1936.)

Twenty years ago *sondaicus* and *sumatrensis* were abundant in the whole Mekong Valley, and they were hunted not far from Saigon, in the marshy plains covered with spiny bamboo. Since then the two types have completely disappeared. The last specimen killed (*sondaicus*) was secured by a European hunter in upper Cambodia two years ago. The animals may be considered practically annihilated. (André Kieffer, *in litt.*, November 21, 1936.)

P. Vitry (*in litt.*, December 20, 1936) sends the following information concerning *sondaicus* and *sumatrensis* in Laos. Before 1890 they were still quite numerous on the western buttresses of the Annam mountain chain. The maximum frequency was in the south and more particularly on the Boloven Plateau and the slopes extending west to the Mekong on the boundary of Cambodia. During the last 30 years I have only once seen tracks. The last specimen killed in southern Laos, so far as I know, was in 1911 in the Boloven Plateau region. I am sure that a very few still exist: in the Sonla-Samnena region, probably also in certain regions of the Boloven Massif, practically uninhabited and not visited by the natives, and in the mountain buttresses separating the upper Sélanong and Sékong from Kontum. There has most certainly been an intensive destruction by native hunters on both banks of the Mekong; they even drive the animals down to the sea (particularly in the Phanrang, Camranh, and Phanthiêt districts in southern Annam). The purchase price for a complete rhino ranges from about 1,000 piasters in 1910 to about 2,000 piasters at the present time. Everything is utilized by the Chinese pharmacies—not only the horns, but also the meat, the hide, the blood, the vital organs, and especially the urine! In my opinion no protective measures can be taken.

Loch (1937, pp. 142-144) has assembled more definite information concerning this species in Indo-China. He quotes E. M. de Villa as follows: "The one-horned rhinoceros . . . is still to be found in several parts of Indo-China, being fairly well represented on both sides of the great Annamite Range, and both north and south of it. . . . It is known and hunted on the Dar Lac Plateau at an elevation of about 3,000 feet, and last year some natives invited me to hunt a party of about four rhinos near Cua Rao, about 100 feet above sea level. Rhinoceros and elephants . . . are met with between Kratie and Sung Treng, south of Saravane (in Cambodia—to the east of the Mekong) and in many places in Laos."

Loch (1937, p. 143) writes:

> M. Antoine Lagreze, the Rèsident at Vinh in Northern Annam, . . . has written . . . that several specimens still exist in the dense forests separating the provinces of Vinh and Thanh-Hoa, in northern Annam. Also in the

forests between the province of Luang-Prabang and the Vème military territory. The writer states that during 1924 he located a band of rhinos in the province of Sam-Nua where formerly they abounded. . . . Fifty years ago these animals were numerous in the Annamite Chain and in the forests of Nord-Annam and Haut-Laos. They have been destroyed by Meos, a mountain people who have immigrated from China in recent times. . . . The value of the horns was so great that they figured in the tribute sent by the King of Luang-Prabang every year to the Emperor of China and the Emperor of Annam. At the present time in the royal marriages of Luang-Prabang a rhino horn frequently figures in the dowry of the young princess. . . .

Professeur Bourret, . . . writing from Hanoi is certain . . . of *sondaicus* as far north as Tonkin where it has recently been killed in the province of Son La. . . .

Bourret maintains that *sondaicus* . . . has been killed in La Nha, also at Bien-Hoá at Cap St. Jacques not far from Saigon, in the south of Cambodia. Also in the region of Xieng-Khouang in Tran Ninh, North-east Laos . . . . He estimates that perhaps 30 of the one-horned rhinos have been killed in Indo-China by European hunters since 1900. About 1900, two skulls were sent home from Bien-Hoá to the Paris Museum,—these appear to be the only specimens of *sondaicus* from Indo-China in any Museum.

"M. J. Loupy, Commissaire du Gouvernment at Luangprabang in Laos, from enquiries from native authorities, thinks that no rhino has been met with during the last five years in the Kingdom of Luangprabang" (Loch, 1937, p. 144).

Malay States.—According to Ridley (1895, p. 161), the common rhinoceros of the Malay Peninsula "appears to be *R. sondaicus*. It frequents the hill-jungles, ascending to 4,000 feet altitude . . . . As the jungle gets cleared, it wanders often into the low, open country, apparently losing its way. It is a quiet, inoffensive beast."

"In 1921 it was known that two animals of this rare species were round about Changkat Jong not far away from Chikkus, and one of them was shot by a planter" (Times of Malaya and Planters' and Miners' Gazette, Ipoh, February 1, 1932).

"In Perak, lower Malay Peninsula, . . . two individuals have been killed in the last thirty years, the mounted heads of which are now in the Selangor Museum" (Barbour and Allen, 1932, p. 146). "Both these animals seem to have been extremely savage and given to unprovoked attacks. The Pinjih beast had been the terror of its valley from long before the British Occupation (1874)." (Kloss, 1927, p. 208.)

Comyn-Platt (1937*b*, p. 48) writes:

Undoubtedly the rhinoceros is having the most serious time, and I fail to see how his existence can be much further prolonged. After all trade will always defeat sentiment in the long run, and as the Chinese are convinced that rhinoceros horn is a most valuable aphrodisiac and will pay as much as three or four hundred dollars to get it, can one be surprised if this animal is being hunted to extinction? And this is happening in other countries besides Malaya.

Whether or no commercialism is the reason for the practical disappearance of *Rhinoceros sondaicus* I am not prepared to say. But the fact remains that it is rarely, if ever, seen nowadays. It is believed that two or three are still to be found in the swampy lands of South Perak. There is no certainty, however, about this.

Loch writes (1937, p. 135) on its status in Malaya:

Few specimens of the Javan rhinoceros are left in Malaya at the present time. In the state of Perak, at least three are believed to exist in the Erong and Chawang areas, to the west of Trolak. At least one is to be found in the Lekir district, on the other side of the Perak River near Sitiawan. After the shooting of a *sondaicus* in 1928 at Ujong Pematang, a search was made at the instance of the Game Warden in the area between the Selangor and Bernam Rivers. The results were unsatisfactory, but it is believed that the tracks of two were found. These half-dozen are all that are known to exist in the Malay Peninsula. There may be others; it is sad to think there may not be so many. . . .

We do not know if the Javan rhinoceros was ever numerous in the Malay Peninsula previous to the British occupation of the Straits Settlements. Early Portuguese and Dutch writers refer to the "badaks" to be found inland, and there must have been a continuous trade in rhinoceros horns between the Malays and merchants from China.

Loch also enumerates (pp. 135-140) the known records from Malaya, as follows: Province Wellesley, 1816; Pahang, an unverified sight record in 1891 (the only record from the east side of the Malay Peninsula); Temoh, Perak, 1890's; Batu Gajah, in Kinta, two in 1897; Sungai Palawan, Lower Perak, 1898; Pinji Valley, in Kinta, 1899; Dindings and Bruas district of Perak, four between 1905 and 1921; Telok Anson, 1924 and 1932; Ujong Permatang, Selangor, 1928.

"Whether or not the species still exists in the Malay Peninsula is a moot point. My own view is that this species should not be killed under any circumstance, scientific, or otherwise." (F. N. Chasen, *in litt.*, May 5, 1937.)

Sumatra.— Hazewinkel (1933, p. 1019) records the killing of seven specimens in Sumatra, and adds: "The Chinese gladly pay quite a lot of money for the hide of the one-horned rhino (up to fl. 1500), and, in particular, the chula, or horn, will fetch fancy prices, even up to 4000 guilders (nearly £500). The two-horned *Rhinoceros Sumatrensis* is, on the contrary, far less valuable: will fetch, in fact, only about one-tenth of the above-mentioned prices. Hide, horn, bloods, and other parts of the body, pulverized or as an extract, provide the most essential ingredients for very potent and renowned medicines. According to the Chinese and the natives, those medicines should be able to give back lost strength, youth, and vitality, and cure various diseases. The horns are sometimes modelled into goblets. Water or some other liquid, when left in such

a vessel for some days, should then become a veritable panacea against all ailments and diseases, even tuberculosis and the plague!"

Heynsius-Viruly and Van Heurn (1936, pp. 40-47) give the following account:

On the eastern coast of Sumatra both species of rhinos were known by the natives for ages past. [Reports by Marsden (1811), Raffles (1822), and Hagen (1890) are quoted.] In 1885 Neumann wrote: " . . . Formerly the export of this article [horn] was rather important, but at present it has largely ceased, first because the rhino has become scarce and secondly because the natives no longer indulge much in hunting." . . .

The district in Atjeh, now set apart as a large game reserve, is criss-crossed by many . . . rhinoceros paths [apparently made by both species]. . . .

In 1925 Mr. Hazewinkel had the good fortune to shoot a *sondaicus* in South Sumatra. Later he shot six more and two *sumatrensis*. [He tells] how they became aggressive through contact with man (and bullets), how they kill cattle . . . .

Presumably the magic power [of the horn] manifests itself in three ways:

1. A poisonous snake bite may be healed by placing a small piece of the horn on it.

2. A poisonous drink may be detected by putting it in a tumbler made of rhinoceros horn. If it contains poison, the liquid will foam.

3. It works as an aphrodisiac when taken in powder form or mixed with water.

Belief in the first and second of these superstitions is to be found all the way from Arabia to China and Japan. Bombay is one of the most important markets for rhinoceros horn. . . . Even Indo-Europeans sometimes believe in it. . . . The general opinion is that the effect is nil or based upon suggestion. . . .

Little is known as yet of the action as an aphrodisiac mentioned above. . . .

Reports received from Sumatra [as to the occurrence of rhinoceros] . . . are not at all optimistic. The last *sondaicus* seen in South Palembang is said to have been shot in 1928. In the Lampong Districts the same distinction, reported by Hagen from the East Coast, is made between the "Badak karbo" and the "scaly badak," the latter seemingly being *sondaicus*. . . .

Reports from all other parts of Sumatra where rhinoceros are said to occur, always mention that they are found very sporadically only. On the whole, rhinoceros still occur in the plateaus and mountain swamps of Atjeh, especially in the Gajo and Alas districts, in the extensive forests in the hinterland of Langkat, at the salt springs on Sumatra's East Coast, at Indragiri (between Taloek and the P. R. I.), in Riouw, Djambi as well as N. W. Palembang (Benarat). On the western coast they are still found in the Barisan Mountains, though in small numbers. In the early 19th century, rhinos were quite numerous in the vicinity of the Peak of Korintjih, but they *are* practically extinct there since 1915, mainly owing to intensive hunting by means of pit traps. They are threatened with rapid extermination in Bangko, where the controler BB. reports that "they may perhaps hold their own for some ten years more."

De Voogd [1933] . . . remarks with some sarcasm that since or due perhaps to the hunting expeditions of Hazewinkel about 1925, the rhinos have decreased at a terrific rate.

Java.—Lydekker makes the remarkable statement (1900, p. 27)

that "in Java tame individuals are frequently to be seen wandering about the villages of the natives."

"In Java the Rhinoceros is now reduced to a single herd, which is confined to the Bantam district, at the extreme west of the Island. The herd is said to consist of about fifty individuals, which are very strictly preserved." (Harmer, 1922, p. 16.)

According to Dammerman (1929, pp. 7-8), "the Javanese species . . . has decreased so considerably that its number for Java has been estimated at hardly more than a few dozens. . . . From Java hardly any export has taken place publicly as here the rhinoceros has been protected since 1909, but all the same, many a specimen has been killed illegally."

Heynsius-Viruly and Van Heurn (1936, pp. 40-46) give the following account:

> In Java . . . it has been exterminated, except for a few specimens. . . .
>
> Much has been written about the fierceness of the rhinoceros. . . . They seem to have an especial dislike for naturalists. In 1827, G. von Raalten, anatomist of the "Natural History Committee of the Netherlands Indies," was attacked and seriously wounded by a rhinoceros [*sondaicus*] at Krawang, Java. . . .
>
> Meanwhile the rhinoceros disappeared long ago from Krawang. In their original habitat in Java, which was restricted to the western and central districts, steady hunting during the past century has made them so scarce that their complete extermination is seriously feared. This is all the more immediate since one can expect, at the most, one young every five or six years. . . .
>
> In Java, according to reports, *sondaicus* will soon be a thing of the past, if it does not prove possible to sufficiently guard the few remaining specimens in Southwest Bantam and in the Nature Monument Oedjoengkoelon. Although poachers are now punished more severely than before, three corpses of rhinoceros were found in the Nature Monument in 1932. The presence of a single rhinoceros in the district Karangnoengal was reported; also a few specimens in the Garoet Mountains as well as near Pameungpeuk and to the west of Lake Kinder.

Borneo.—This species "has been supposed to inhabit . . . Borneo as well, but statements to that effect need confirmation, and are very likely to be wrong" (Harmer, 1922, p. 16).

"The evidence for its occurrence in Borneo is far from good, being based in part on native report (see Sclater, 1869)" (Barbour and Allen, 1932, p. 145).

Heynsius-Viruly and Van Heurn (1936, p. 47) evidently consider reports of *sondaicus* from Borneo due to confusion with *sumatrensis*.

"E. Banks, Curator of the Sarawak Museum . . . does not believe that *sondaicus* really exists in Borneo" (Loch, 1937, p. 145).

Specimens.—Barbour and Allen (1932, pp. 147-149) list the known museum specimens, and Loch (1937, p. 147) does likewise, making a total of 18 mounted skins, 6 mounted heads, 20 skeletons, and 40 skulls.

Loch also gives (p. 146) an estimate of 66 specimens living at present, including 4 in Burma, 6 in the Malay States, 6 in Sumatra, 24 in Java, 8 in Siam, and 18 in Indo-China.

Sumatran Rhinoceros. Rhinocéros de Sumatra (Fr.)

DICERORHINUS SUMATRENSIS SUMATRENSIS (G. Fischer)

[*Rhinoceros*] *sumatrensis* G. Fischer, Zoognosia, vol. 3, p. 301, 1814. (Based upon "the double horned rhinoceros of Sumatra" of Bell, Philos. Trans. Royal Soc. London 1793, pt. 1, p. 3, pls. 2-4, 1793; "about ten miles from Fort Marlborough," Sumatra.)

FIGS.: Bell, 1793, pl. 2; Temminck, Natuurl. Geschiedenis Nederl. overz. bezittingen, Zool., Mammalia, pl. 34, 1839-44; Gervais, Hist. Nat. Mammif., pt. 2, pl. 31, 1855; Elliot, 1907, p. 105, fig. 25; Mjöberg, 1930, pl. 2.

This typical subspecies of the two-horned Sumatran Rhinoceros, occurring in Sumatra and Borneo, has very seriously declined in numbers.

It is said to be distinguished from the form of the Malay Peninsula by skull differences and also by its grayish instead of blackish color (J. E. Gray, 1873, pp. 358-359). According to Bell's original description (1809, pp. 283-284), the general color is brownish ash; belly between the legs and folds of skin dirty flesh-colored; ears small and pointed, edged with short black hair; upper lip pointed and prehensile; whole skin rough and covered very thinly with short black hair; tail covered with long hair; a fold of skin behind the shoulder, and others on the lower side of the neck. Height of male at shoulder, 4 feet 4 inches; length from tip of nose to end of tail, 8 feet 5 inches; anterior horn, about 9 inches; posterior horn, 4 inches.

Sumatra.—Heynsius-Viruly and Van Heurn (1936, pp. 40-41) refer to early records by Bell (1793), Marsden (1811), Raffles (1822), and Neumann (1885).

In 1906 W. L. Abbott (in Lyon, 1908, p. 623) found rhinoceroses (species not determined) common on the mainland in Eastern Sumatra opposite Pulo Rupat. The following remarks of Dammerman (1929, pp. 7-9) apply to two species:

> The rhinoceroses need protection urgently. The Javanese species (*Rhinoceros sondaicus*) has decreased so considerably that its number for Java has been estimated at hardly more than a few dozens, and also the Sumatra kind (*Rh. sumatrensis*) is strongly on the decline. These animals, besides being a victim to big-game hunting, are taken by the natives for the sake of their horns . . . . These horns are highly valued by the Chinese, at some hundred guilders a piece, and are used for a secret medicine. . . . The exported horns go mostly to Singapore, only a small quantity goes directly to China. . . . In the islands outside Java the rhinoceroses remained pretty much unprotected up to the present. The principal port for export of this product is Tandjoengselor in East Borneo. . . . We see by the given prices, which vary between 200 and 400 guilders a kilogram, what large sums the Chinese will spend for these horns. We do not possess exact figures about the weight of rhinoceros horns, but it is improbable that the weight of the two horns of the Sumatra

species should exceed one kilogram. So we may suppose that during the last ten years an average of forty rhinoceroses yearly were sacrificed to the superstition of the Chinese, for, of course, there can be no question of any curative action of the horn. With the new regulations both species of rhinoceroses will be protected and also the export of their horns will be forbidden, so we hope to be in time to save these remarkable animals from total destruction.

According to the statistics given by Dammerman (1929, pp. 90-91), 49 kilos of rhinoceros horns were exported from the Netherlands Indies in 1919, 70 in 1920, 38 in 1921, 68 in 1922, 39 in 1923, 24 in 1924, 16 in 1925, 22 in 1926, and 26 in 1927. These figures indicate unmistakably an increasing scarcity of the animals.

J. Gourin (*in litt.*, August 7, 1933) speaks of *sumatrensis* as pretty rare. Formerly "we had them near Boeloe Telang, and I believe there is still a couple living on Lepan."

Heynsius-Viruly and Van Heurn (1936, pp. 43-44) give the following information:

> Otto's hunting descriptions [1903] are of particular interest to the Netherlands Committee because they relate to that part of Langkat lying along the Upper Lepan River, a district set apart long ago as a forest reserve and which connects, along the boundary of Langkat and Atlas, with the recently proclaimed game reserve. All rhinoceros shot by Otto belonged to the two-horned species. . . . There is . . . much chance that both species will be found in the newly established game reserve. . . .
>
> The Netherlands Committee for International Nature Protection formerly described how the Natives [in northern Sumatra] hunt rhinoceros by means of a spear-trap.

Mjöberg writes (1930, p. 18): "In Sumatra, so it is said, the Battas creep up so close to the rhinoceros as to be able to cut the sinews of its back legs with a sharp knife."

"Rhinoceroses are close to extinction in northern Sumatra, although a few are supposed to remain in remote parts of the Wilhelmina Range. A 'pawong' or native chieftain told us that the animals once were very numerous on the plateau at Blangbeke. . . . The pawong and his men hunted the rhinos here twenty years ago, using both guns and dead-falls over the rhino trails. . . . The pawong personally had captured 24 rhinos with these spike traps. . . . The pawong used to obtain 250 rupees (guilders) for a catty (1.36 lbs.) of powdered horn." (Ulmer, in Miller, 1942, pp. 161-162.)

Borneo.—"The Rhinoceros . . . is still extant, but it seems to be confined to the mountainous regions in the far interior of the island, and I do not suppose that more than half a dozen specimens have been sent to European museums" (Shelford, 1916, p. 42).

To the foregoing statement, H. N. Ridley adds in a footnote that *sumatrensis* is common in British North Borneo, and that he passed four in one trip.

Mjöberg (1930, pp. 17-19) gives the following account for Borneo:

He lives in the most inaccessible tracts, which are free, as a rule, from all human visitors. . . .

Near the upper springs of the River Boh, in Central Borneo, we one day . . . came upon no less than four specimens. [Three of these fled but one attacked the procession of bearers. The meeting with a party of four was very exceptional.]

The nomad tribes that wander through the central districts of Borneo are very keen rhinoceros-hunters. The Punans follow his trail without a sound and blow poisoned darts at his more vulnerable points. They may follow one and the same animal for weeks without giving up the pursuit, until they have secured a suitable opportunity to use their blow-pipe. . . .

It is chiefly the horns that are highly prized for trading purposes. They are sold for several hundred shillings apiece to the Chinese from the districts round the coast, who use them for the preparation of a medicine in great request . . . as a cure for ailments of every description.

The fate of the rhinoceros family should soon be sealed in Borneo, for every year a very large number of them are killed simply for the sake of their horns. At the twelfth hour the Sarawak Government—acting on the author's initiative—has introduced certain restrictions on rhinoceros-hunting, but they are not strictly enough enforced. . . . It is of course true that the rhinoceros is also to be found in Dutch Borneo, but apparently not in such numbers as in highly favoured Sarawak. . . .

The hunting of the rhinoceros ought to be entirely forbidden for humanitarian reasons. It is a perfectly harmless creature, that does not do any mischief. . . . The rhinoceros stands badly in need of protection to enable it to survive in modern conditions.

Banks (1931, pp. 19-20) writes concerning the Bornean animal:

[It occurs] in the mountainous region in the Lawas interior, various places in the far interior of the Baram and Rejang Rivers, occasionally straying as far down as the Ulus of Mukah and Oya but is not found on the left bank of the Rejang or down into Saribas and Sarawak proper. . . .

Now there can at the moment be no fear of Rhinoceros becoming scarce for as many as 36 trophies were brought into Belaga in two years not so long ago and I have met men who have claimed to have shot over 30 in the course of their life time, but it must be evident that such a slow breeding animal cannot stand destruction for long at this rate . . . .

Reserves so successfully made in other countries are impossible to enforce here.

Heynsius-Viruly and Van Heurn (1936, pp. 47-48) contribute the following:

Reports from Borneo are hardly more favorable [than from Sumatra]. We are told that in West Koetai rhinoceros are quite scarce and confined to remote and inaccessible spots. The area it occupies is said to be large, but the numbers few and steadily decreasing, once more due to hunting.

In some subdivisions their survival is seriously threatened, while they are already extinct in Martapoera. They occur nowadays mainly north of the Mahakam River, where they extend high up into the mountains. . . .

R. sumatrensis is also reported from Boentok and Apau-Kajan; and is said to be fairly numerous in the highlands near the boundary of British North Borneo, outside inhabited districts, as well as at the headwaters of the Malinau and Toeboe.

The foregoing localities are shown on a map accompanying an article by J. L. P. Zondag [De Tropische Natuur, vol. 20, p. 221, 1931]. Although there are quite a few of these places, the small number of specimens gives food for thought. May the establishment of large reserves soon remove all danger of their extermination in Borneo also.

Comyn-Platt (1937, p. 54) writes of conditions in British North Borneo: "As to *R. sumatrensis,* I understand there are still a few left. I can well believe its approaching extinction, for . . . the Chinese will pay any price for the horn, which has a medicinal value. But realizing the great demand the Customs Authorities take every precaution to prevent the export. It is not easy."

"The Dyaks make or have made a very good thing out of hunting *sumatrensis* for sale to the Chinese" (Loch, 1937, p. 145).

Chittagong Rhinoceros; Hairy-eared Sumatran Rhinoceros

DICERORHINUS SUMATRENSIS LASIOTIS (Buckland)

Rhinoceros lasiotis "Sclater" Buckland, Land and Water, August 10, 1872. (Based upon a living female captured south of Chittagong, Bengal, at a distance from that point marched by elephants in about 16 hours (P. L. Sclater, 1872, p. 493).) (On the authorship of *lasiotis,* see Harper, 1940, p. 201.)

FIGS.: Nature, vol. 5, p. 427, 1872, and vol. 6, p. 519, fig. 2, 1872; P. L. Sclater, 1872, pl. 23, 1873, pp. 791-792, figs. 1-3, and 1876, pl. 98.

Malaccan Rhinoceros

DICERORHINUS SUMATRENSIS NIGER (J. E. Gray)

Ceratorhinus niger J. E. Gray, Ann. Mag. Nat. Hist., ser. 4, vol. 11, p. 357, 1873. ("Malacca.")

SYNONYM: *Ceratorhinus blythii* J. E. Gray (1873).

FIGS.: P. L. Sclater, 1873, p. 793, figs. 4, 5, and pl. 67; P. L. Sclater, 1876, pl. 97; Lydekker, 1900, pl. 1, fig. 4; Peacock, 1933, pl. 6 (no posterior horn visible); Jour. Bombay Nat. Hist. Soc., vol. 37, no. 1, suppl., pl. 33, 1934.

Since the ranges of the two mainland representatives of the Asiatic Two-horned Rhinoceros have not been satisfactorily delimited, it seems advisable to treat both in a single account. The Two-horned Rhinoceros has been greatly reduced in numbers but is not yet so near the vanishing point as the Smaller One-horned Rhinoceros (*sondaicus*).

The type of *lasiotis* was a female about 4 feet 4 inches high at the shoulder and about 8 feet from the snout to the root of the tail; anterior horn low and rounded, above the nostril; posterior horn conical, above the eye; ears fringed with drooping hair about 5 inches long; interior of ear conch nearly naked; upper lip pointed and prehensile; tail with numerous transverse folds, and with long hair on the anterior and posterior borders of its lower third; skin

ashy gray, covered with bristles about 1 inch long; bristles rufous on back, dark brown between shoulders, almost white on neck and head, black on lower half of trunk and on limbs; tubercles of the skin so small and flat that the skin is almost smooth (Anderson, 1872, pp. 129-131; P. L. Sclater, 1873, p. 791). No adequate description of the male of *lasiotis* seems to be available. A male from 20 miles south of Comillah, in Tipperah, Bengal, presumably of this subspecies, had a front horn 8½ inches long, while its second horn was a mere stud (Proc. Zool. Soc. London 1877, p. 269).

The type specimen of *niger* "is peculiar for having a very rough skin, the body being covered with thick black hair" (J. E. Gray, 1873, p. 357). An average male from Burma, presumably of this form, was 9 feet 5 inches from nose to tip of tail; tail, 1 foot 9 inches; light buff on body; face, tail, outsides of legs, and portions of flanks black; under parts of body, legs, and hips a light flesh color; hairy throughout, but less hairy on face and head; very hairy on legs and ears; a thick fringe of hairs along the flattened surface at the tip of the tail; heavy folds of skin behind the shoulder, in front of the thigh, and round the neck. The front horns of males average 7 or 8 inches, and those of females about 3 inches; the posterior horns of males average about 3 inches, and those of females are mere knobs. (Peacock, 1933, pp. 71-72.)

Specimens from Bengal and Assam may be provisionally regarded as *lasiotis*, and those from elsewhere on the Asiatic mainland (Burma, Siam, French Indo-China, and Malay States) as *niger*.

Bengal and Assam.—Specimens of the Two-horned Rhinoceros have been recorded from the valley of the Brahmaputra, 40-50 miles northeast of Dohbree, Assam, and from 20 miles south of Comillah, Tipperah, Bengal (Proc. Zool. Soc. London 1875, p. 566, and 1877, p. 269). By 1900 the animal was considered rare in Assam (Lydekker, 1900, p. 29).

"In the [Assam] reserves a great number of rhinos were destroyed last year, but with military police guards stationed in these localities this summer, it is hoped that there will not be so much poaching" (Hanson, 1931, p. 37).

Milroy writes (1934, p. 102) as follows concerning the animal in Assam:

> Formerly common in the Lushai and Manipur Hills and occasionally found in North Cachar, but by now almost hunted to the vanishing point by Lushais and Kukis. The opening up by forest villagers of several big patches of marshy land in the Forest Reserves of South Cachar seriously reduced the number of suitable haunts available for this species. Most of the remaining patches, however, will have to be kept closed to cultivation in order to preserve feeding-grounds for the timber-dragging elephants, and some special steps have already been taken to try and look after the few rhino still left alive in this difficult country where little control can be exercised over

shikaries. The record flood of July, 1929, drove the rhino up into the hills and very few have been allowed by the Lushais to return.

"Whether this species continues to exist in India proper is a matter of speculation. It has probably been exterminated or is on the verge of extinction from this country. Probably does not survive in Assam." (Bombay Natural History Society, *in litt.*, December, 1936.)

Burma.—"While at Bhamô in Upper Burmah, I was informed by an intelligent native that two-horned Rhinocerotes are found in the Mogonny district, which is close to the confines of Assam, and as far north as the twenty-sixth degree of north latitude" (J. Anderson, 1872, p. 129).

Peacock (1933, pp. 72-73) gives the following account:

> In the days before the advent of fire-arms the Sumatran rhinoceros must have been fairly common throughout Burma. Even now it is thinly distributed near the watersheds of most of the important hill-systems from Myitkyina in the north to Victoria Point in the extreme south of the Province. . . .
>
> The Sumatran rhinoceros has been so heavily poached within the past twenty years that there are now vast stretches of suitable evergreen forest from which it has been completely exterminated. It may still be located in parts of Myitkyina, in the angle between the Chindwin and the Uyu Rivers, in the Arakan Hills as far south as Bassein, in parts of the Pegu *Yomas*, in parts of the Salween and Tenasserim drainages and in a few other remote hill tracts. . . .
>
> The only area in which rhinoceros is now fairly common is the Shwe-u-daung Game Sanctuary in the Mogok Subdivision of the Katha District. There are about ten rhinoceros in this sanctuary but, in default of adequate protection, I should not be surprised to hear that they had been decimated by some enterprising gang of poachers. The perpetuation of this species undoubtedly depends on the proper protection of this sanctuary which, hitherto, has been guarded only by the occasional visits of one or two forest subordinates and a peculiar superstition to the effect that the sanctuary is occupied by wood-spirits which are intolerant of poaching.
>
> The blood and horn of the Sumatran rhinoceros have a very high medicinal value in the imagination of Chinamen, Burmans and tribesmen indigenous to Burma. One gathers that such parts of a rhinoceros have the properties of a very potent aphrodisiac. An average horn, about 8 inches in length, is worth about 1000 rupees, and the blood, when dried, is valued at its own weight in silver. Other parts of the rhinoceros have a lesser value but, in the extreme south of Burma, the inhabitants find a medicinal use even for the urine and dung. An animal, the parts of which are invested with such value, is bound to be mercilessly hunted, and this has been the fate of the Sumatran rhinoceros in Burma.

Siam.—"I may state that both the one-horned and two-horned rhinoceros (*R. sondaicus* and *R. sumatrensis*) are to be found in Siam but, owing to the hunting by the hill tribes both are now extremely rare, so much so that some five years ago the killing of them was prohibited by the government. Their extermination was

mainly due to the Chinese for their horns for medicinal purposes, the said horns being probably worth their weight in gold to-day. There has for many years been a special customs duty on them." (William W. Fegan, in Loch, 1937, pp. 133-134.)

(See also the account of *R. sondaicus* in Siam.)

French Indo-China.—(See the account of *R. sondaicus* in this country.)

Barthélemy (1930, pp. 131, 139) refers to this species as a rare animal in Indo-China, living in rocky, densely thicketed, mountainous places; he records one killed by Laos hunters in 1904 at Camranh, south of Nhatrang, Annam.

Undoubtedly the present species has existed, and probably still exists, in Indo-China, since M. H. Maitre and M. Fernand Millet himself have seen several skulls armed with two horns. Its occurrence in Cambodia and on the Darlac is noted. (De la Chevasnérie, 1936?, p. 340.)

Malay States.—"There are several known of in Perak (this was in Jan. 1932) also Selangor and Hubback told me himself that they were in Pahang" (Arthur S. Vernay, *in litt.*, March 1, 1933).

"Personally, I am inclined to believe the last species of rhinoceros to exist will be the Sumatrensis as this animal lives in the most remote and inaccessible places, in hills that are practically impossible to man, and quite impossible to elephants, whereas the Unicornis is quite easy to obtain and kill, and the Sondaicus, almost gone, also lives in fairly accessible country" (Arthur S. Vernay, *in litt.*, October 27, 1933).

In the Malay Peninsula "the two-horned animal (*R. sumatrensis*) is more common [than *sondaicus*] but I did not see any. In recent years one of these was shot by the Sultan of Johore . . . . H. H. The Sultan is very jealous as regards the protection of animals in his own jungles, and great credit is due him for instituting game laws in his State, even before development of the country had begun." (Burgess, 1935, p. 251.)

This rhinoceros "needs rigid protection everywhere. In the mountainous parts of the Malay Peninsula it is, probably, still not uncommon." (F. N. Chasen, *in litt.*, May 5, 1937.)

Black or Hook-lipped Rhinoceros

DICEROS BICORNIS BICORNIS (Linnaeus)

Rhinoceros bicornis Linnaeus, Syst. Naturae, ed. 10, vol. 1, p. 56, 1758. ("India," but fixed by Thomas as Cape of Good Hope.)

Somali Black Rhinoceros

DICEROS BICORNIS SOMALIENSIS (Potocki)

Rhinoceros bicornis somaliensis Potocki, Sport in Somaliland, p. 82, 1900.
FIGS.: Dugmore, A. R., Camera Adventures in the African Wilds, figs. opp. p. 16, 1910; Ward, 1935, figs. opp. pp. 343, 345, 347; Maxwell, M., 3 pls., 1930.

The African Black Rhinoceros is readily distinguished by its rather narrow muzzle, with a hooked rather than squared upper lip. The two horns are placed one behind the other on the nose, the posterior one usually the smaller, though in some cases the reverse is true (giving rise to the belief that this condition represented a second species, the keitloa). Skin thick and dark brown in color. Hoofs three on each foot. Head and body about 10 feet long; tail, 28 inches. The record front horn, measured on the outside curve, is given by Rowland Ward as 53.5 inches (a female). The average is much less, perhaps about 20 inches.

The Black Rhinoceros avoids wet forest country but prefers rather dry thorn bush and plains with streams here and there where it may drink. Its range therefore included formerly the Cape region in the south, from southwestern Angola across the Cape Province to eastern Africa, and north, avoiding the Congo Basin and its rain forests, to Somaliland and southwestern Ethiopia, thence westward along a strip between the Sahara and the Congo and Nigerian forests to the region of Lake Chad and the French Cameroons. Over this vast area are localities where rhinos are absent, as along the coast of Kenya and Tanganyika Territory, or between the Chobe and the Zambesi, where according to Selous the natives say there were none even in days before white occupation. Formerly common locally, the Black Rhino has become much reduced of late years. In the northeast of this general range, east of the Tana River and Lake Rudolf in Kenya Colony, the animal is supposed to be slightly smaller and is generally regarded as a distinct race, *somaliensis,* but the extent of these differences needs more particular definition, and the two may here be considered together.

Sclater (1900) and Shortridge (1934) have given a good summary of its history in South Africa. It seems to have first become known to Europeans about 1653 at the time of the first settlement of the Cape. "It is frequently mentioned in van Riebeck's diary, and apparently at that time, was common enough on the slopes of Table Mountain and on the Cape Flats; a further incident corroborating this is, that the coach in which Simon van der Stel, the Governor, was proceeding northwards, on a journey to Namaqualand in 1685, was upset in the neighbourhood of Piquetberg, by the charge of a rhinoceros, and the Governor himself had a narrow escape. Tachard

who spent some few weeks at the Cape at the same time (1685), and Kolben who wrote about fifty years later" give descriptions of it. In those days widespread over the whole of South Africa, it was still common along the south coast of the Colony in 1700. The last one in the Cape region was said to have been killed in 1853, on the Coega River, close to Port Elizabeth, while in the Orange Free State the last one killed is said to have been in 1842, a decade earlier, in the Kroonstad district. In the 1840's rhinos were still rather common in Bechuanaland, "but now they are extinct both there and probably also in Rhodesia." (W. L. Sclater, 1900.) In 1900, according to Sclater, their last haunts south of the Zambesi were "Zululand, the Lydenburg district (where a few are preserved), the Beira-Zambesi country and perhaps Ovampoland."

Kirby (in Bryden, 1899, pp. 38-40) wrote at the end of the last century that "a few years ago rhino were far more widely distributed throughout central South Africa than at present. There are probably not a dozen left in even the remotest corners of the northeastern Transvaal, where once they abounded; two or three in the Matamiri bush, and a few in the Libombo range near Oliphant's River represent all. In the rough broken country south of the Zambesi and east of the Falls, in parts of . . . Portuguese East Africa they are still fairly numerous, and there are a few in Matabeleland, Mashonaland, and Amatongaland." This statement is apparently more or less near the truth at the present day, nearly forty years later. At all events, in the annual report as to conditions in what is now Kruger National Park, the Game Ranger states in 1925 as follows: "A few of the species exist in the neighbourhood of the Shingwedsi River. I was long under the impression that no survivors now existed south of the Olifants River; but during the past year, I personally came on fresh tracks of a single animal in the Sabi Bush, and it is therefore fairly certain that the dense covert in the neighbourhood of the Matumiru Spruit, still holds several of the species. The rhinoceros is a type fast disappearing from even the best game countries of Africa today, and in view of its slow breeding nature, exceptional efforts should be made to preserve it from extinction. Fortunately it has no natural enemies." The most recent report available, 1934, gives as an estimate of the numbers in eastern South Africa, "a few" in the Umfolosi Reserve, approximately 85 in the Hluhluwe Reserve, and a few in the Mkuzi Reserve, Natal. The number in Kruger Park in 1932 was believed to be "under half a dozen." In western South-West Africa a small remnant still exists. In the Kaokoveld, according to Shortridge (1934), between the lower Ugab River and the Cunene there may be still between 40 and 80 rhinoceros, but "in 1923 Manning estimated that, at most, there were 50 in the entire territory," so that a slight increase may be

indicated. Steinhardt estimated about one to every 12 km. along the south bank of the Cunene, across which in southwestern Angola they are more plentiful. Shortridge states that they are very rare in Ovamboland, with none in the Namutoni Game Reserve. There are still a few in the central Caprivi, but none in the eastern. In Portuguese East Africa there are apparently a number of these animals, and it is believed that from time to time they come over the border into the sanctuary of Kruger National Park. In Northern Rhodesia they appear to be restricted to the southern and eastern parts, where, however, according to David Ross (in letter, 1936) they are "being thinned out to the danger line." In Nyasaland they are "very scarce in most districts, though still to be found in several of the more remote parts of the country, such as in the Dowa and Kotakota districts. They are protected and but one may be obtained on a visitor's full license or on a special license." (Wood, in Maydon, 1932, p. 315.)

Proceeding northeastward from these localities, the Black Rhinoceros seems to have its present center of abundance in Tanganyika and especially in Kenya Colony. Up to 1920, at least, it was considered "abundant in the northern districts, becomes scarcer in Tabora, Kilimatinde and Handeni, and is present in small numbers only in Mahenge, Malinyi, Mamanyere and Tunduru, apparently becoming abundant south of the railway only at Ifakara" (Jour. Soc. Preservation Fauna Empire, pt. 2, p. 47, 1922). In Kenya Colony, C. W. Hobley writes (in August, 1936) that in the past 20 years the rhino population has greatly decreased and is at present probably only 20 percent of what it then was. "If, however, the permanency of the great reserves is assured, the perpetuation of the species is certain." From the report of the Kenya Game Department for 1926, it appears that along the edge of the forest, these rhinos became so numerous that at the request of the local inhabitants the department undertook to reduce the number of the animals in the Nyeri district "where they had for some time been a source of danger and annoyance." Twenty-eight were thus killed. A later report (in *East Africa,* June 8, 1933) tells that "Mr. J. A. Hunter, the Kenya white hunter, recently shot eleven rhino near Nyeri in three days." Such measures will inevitably reduce the animals considerably but they may be needed in areas under settlement. This condition of affairs was foreseen by the Swedish naturalist Lönnberg, who wrote in 1912: "In settled districts and such with a lively traffic, rhinoceroses may be a troublesome nuisance, especially if they are numerous. But there are vast stretches of land in British East Africa, as well dry steppe as arid thornbush country, which can never produce any kind of crops, and where at most nomadic tribes may be able to feed their flocks. There the rhinoceroses can do no

harm, and there, at least, they may be allowed to remain in reasonable number."

Passing again to the westward, we find these animals few in Uganda. Here their areas are very limited in extent, and within these areas they "do not diminish in number, there is no trade in their horns, and they are little used for food. It is probable that . . . not more than ten are killed in a year." (Coryndon, 1921, p. 28.)

North of Uganda, rhinos are found as far as Mongalla, and the north end of Lake Rudolf, and thence westward to the Ubangi-Shari district and the French Cameroons, avoiding the rain-forest areas of the Congo Basin. In the Ubangi-Shari district they have been protected partly since 1916 and totally since 1933. L. Blancou (in response to query in 1937) states that there are several groups, totalling about fifty individuals in the Parc National and the adjoining game reserve, where they are strictly guarded. From official sources (Ministry of Colonies, Paris, 1936, and Inspection of Waters and Forests, Yaounde, 1937) it is learned that they are found mainly in the north of the territory, in the region north of Maroua, where estimates place the numbers at most as 120, probably less. Their disappearance is laid to European and native hunting—by the latter for the sale of the horns. At the present time they are absolutely protected by regulations.

This species reaches its westward limit in the Lake Chad region and eastern Nigeria. Here in the Yola Province north of the Benue River, a few survivors "may still be encountered, though possibly only a dozen specimens exist in the country; their bones, however, are numerous in the Benue basin and on the Song plateau, while the ingrained fear which the native has of 'Kilifou' shows that the species was plentiful not very long ago" (Oakley, 1931, p. 34). To much the same effect adds Haywood (1932, p. 32) that "around the junction of the Provinces Bornu, Adamawa, and Bauchi, it seems unlikely that more that 50 at most survive. . . . Rhino are so scarce that they should certainly not be allowed to be killed under any circumstances."

The Black Rhino to the northeast of the Tana River and Lake Rudolf is believed to represent a smaller and slightly different race, *somaliensis,* although its distinctive characters do not seem very well defined. It ranges at present, or did, not so many years ago, into the Blue Nile Valley near the borders of Ethiopia, and into the Rift Valley region of southern Ethiopia, as well as eastward into British Somaliland. It is probably now much reduced in numbers owing to constant hunting by the natives. In 1912, while the late Dr. John C. Phillips and I were on the upper Blue Nile, we were told that the animal was then rare. Tracks were occasionally reported by native hunters, but of solitary adults, with no evidence of the

spoor of young accompanying them. They believed that the few remaining animals in the region were so scattered that they were not breeding. In 1899 they were "fairly common on the southern side of the Haud [in Somaliland] . . . and again south of the Webbi Sheybelli" (Stracker, in Bryden, 1899). Drake-Brockman, in 1910, wrote that it was no longer to be found south of Burao, but was still present in the Haud and Nogel Valley, toward the Ethiopian border, and was said to be plentiful in Ogaden. On account of persecution he predicted that "a few more years will see its disappearance from all save the most remote regions." In 1932, Swayne (in Maydon, 1932, p. 235) regarded it as "almost extinct" in British Somaliland, though probably still found in Ogaden. It formerly "penetrated north to Toyo Plains in Ogo."

Unlike the somewhat more peaceably inclined White Rhinoceros, the Black Rhino is rather truculent and at times dangerous, of poor eyesight, but keen of scent and hearing. On being approached, it is quite as likely to come charging down upon the source of the disturbing sound or smell as to dash away out of sight. At close quarters, it is as agile as a polo pony and may follow up its charge and make matters disagreeable. For this reason it becomes a source of danger if, as in the case mentioned in the Nyeri district, its numbers become too great in settled or agricultural localities. Otherwise, it is a harmless animal, browsing contentedly on twigs and sheltering by day in dense thickets of thorn scrub. As the surviving member of its genus, *Diceros,* and one of the end forms of an evolutionary line of ancient development, it possesses peculiar interest and deserves protection, but this can best be given in special reserves. The chief menace to which it is exposed is from hunting by natives, which cannot always be stopped in thinly populated districts. The Somalis value its hides especially for making their small round shields, in which they take much pride, as after a time these become whitish. Some of the native tribes will eat the flesh. But the chief reason for its pursuit by natives and white poachers is for its horns, which are sold to the Chinese to be ground up for medicine in the potency of which they have great faith. To this cause is laid the great reduction in its numbers in the French Cameroons, Somaliland, and Ethiopia, and its continued pursuit elsewhere. C. W. Hobley writes (1936): "There is little demand for rhino horn in Europe but in China high prices are still paid for supposed medicinal uses, and this is the danger, for although legal export is forbidden, smuggling still continues and is difficult to check." This for Kenya Colony. Lavauden (1933) says: in "French Africa it is seriously threatened, thanks to the ridiculous trade in rhino horn." In the French Cameroons there is apparently a good deal of such illicit hunting by the natives, and this is not easily

stopped. In Kenya Colony "the poaching and smuggling of rhinoceros horn has become a serious problem for the Game Department." One lot of 187 horns was recently (about 1930) seized. Presumably the Wakamba kill the animals with poisoned arrows in the Ukamba Reserve. Most of the horn is smuggled into Italian Somaliland, whence it can be freely exported (*East African Standard*, March 7, 1930). There has also been a great illegal trade in rhino horns going on through Zanzibar, but steps have been taken to stop it. According to Caldwell (1924, pp. 51, 53), the Somalis, penetrating Kenya Colony from the north, make use of the native hunters to obtain this horn as well as elephant ivory, which they then smuggle out through Italian Somaliland. "The only real cure is to get Italy to cooperate, and to conform to the Ivory Convention to which she was a signatory." In the Chad Territory it is said that the Arabs, under the pretext of hunting elephants with a regular permit, also kill many rhinos. A local sultan near Fort Archambault has his subjects hunt in his behalf, and this has resulted in the disappearance of the rhino from localities where it was particularly abundant a few years ago. During the period when rhino horn was valuable, the horns of at least 300 animals, weighing 900 kilograms, were sold there (Ramecourt, 1936). It is said that the Chinese prize the horn of the Asiatic rhinos more highly than that of the African species, but nevertheless, with the growing scarcity of the former, that of the latter seems to command high enough prices to make its smuggling worth while.

G. M. A.

Southern White Rhinoceros; Burchell's Rhinoceros; Square-mouthed Rhinoceros; Square-lipped Rhinoceros. Witrenoster (Boer). Rhinocéros blanc du Sud (Fr.)

CERATOTHERIUM SIMUM SIMUM (Burchell)

Rhinoceros simus Burchell, Bull. Sci. Soc. Philom. Paris, année 1817, p. 97, 1817. ("L'intérieur de l'Afrique Méridionale, . . . vers le vingt-sixième degré de latitude"; Burchell himself seems to give no further details, but Selous (in Bryden, 1899, p. 52) indicates as type locality "the Batlapeen country, not far from the present native town . . . of Kuruman [British Bechuanaland].")

FIGS.: Burchell, *op. cit.*, pl. facing p. 100; A. Smith, 1849, pl. 19; Harris, 1840, pl. 19; Schreber, Säugthiere, Supplementband 4, pl. 317K, 1844; Proc. Zool. Soc. London 1886, pl. 16, fig. 1; Coryndon, 1894, pl. 18; Bryden, 1899, pl. 1, figs. 2, 6; Lydekker, 1908, pl. 1, figs. 2, 6, and pp. 36, 45, figs. 13-14; Selous, 1914, pl. 2, right-hand fig.; Vaughan-Kirby, 1920, pl. 27; New York Zool. Soc. Bull., vol. 27, p. 146, fig., 1924; Jour. Soc. Preservation Fauna Empire, n. s., pt. 9, frontisp., 1929; Ward, 1935, p. 344, left-hand fig.

Formerly enjoying an enormous range in South Africa, from Namaqualand to Zululand, and from the Orange River to the Zam-

besi, this rhinoceros is now extinct except in or about two reserves in Natal and possibly in one or two remote areas of Southern Rhodesia.

Largest of all land mammals after the elephants; hairless except for a fringe along the edge of the ear and for the tail bristles; color a slaty gray-black; upper lip straight all round with no trace of a proboscis; ears longer than in the Black Rhinoceros, springing from a closed cylinder about 3 inches long; anterior horn usually longer and slenderer than in the other species; posterior horn usually short, straight, conical. Height of male at shoulder up to 6 feet 6 inches; female rather smaller. Record length of horn, 62.5 inches. (W. L. Sclater, 1900, vol. 1, pp. 300-301.)

The former range corresponds somewhat to the more northerly portions of the Kalahari Arid District and the Southeast Veldt District of Bowen (1933, pp. 256, 259, 260). The distribution is indicated on maps by Heller (1913, pl. 10), by Roosevelt and Heller (1914, vol. 2, p. 671), and by Lavauden (1933, pl. facing p. 25).

Angola.—This animal occurred formerly on both sides of the Okavango, and possibly a few individuals remain on the Kwando. Yet there is no unquestionable record in this region. (Wilhelm, 1933, pp. 55-56.)

"According to Zukowsky, as ascertained by Mattenklodt in 1906, White Rhino are 'very rare' at Lujana (S. E. Angola) in the Tschbombe Bush.

"According to Schulz and Hammer (The New Africa, London, 1877), they were plentiful in that region in the 1870's." (Shortridge, 1934, vol. 1, p. 425.)

In his recent list of Angolan mammals Monard (1935) does not include this species.

South-West Africa.—Of this rhino in South-West Africa, Shortridge (1934, vol. 1, pp. 425, 427) writes:

> Beyond any reasonable doubt the White Rhinoceros has been extinct in South-West Africa for the last 50 years or more; since then no actual occurrence has been recorded. . . .
>
> The fact that the Nama Hottentots and local Bushmen had distinguishing names for Black and White Rhinoceros indicates that both species formerly existed in Namaqualand, Gobabis and Grootfontein Districts, and elsewhere in the more level parts of South-West Africa . . . .
>
> Zukowsky records horns of White Rhino from the sands of the Omaruru and lower Ugab Rivers [Atlantic drainage], and from near Usikos. . . .
>
> As early as 1801, Barrow recorded the "supposed" occurrence of this species in Namaqualand.

Bechuanaland Protectorate and British Bechuanaland.—"When Mr. Burchell . . . visited Latakoo [=Litakun], he found it common in that district, and we have been told by the aborigines that it was not unfrequently found even further to the southward. Of late, however, it has almost ceased to exist even in the situations where its

discoverer met it, which is accounted for by the danger to which it is exposed being now much increased from the general introduction of firearms among the Bechuanas." (A. Smith, 1849, text to pl. 19.)

Campbell (1822) records this species in Bechuanaland, and Livingstone (1857) and Baines (1864) note it near Lake Ngami (W. L. Sclater, 1900, vol. 1, p. 299). Selous (1881, pp. 725-726) writes:

> Twenty years ago this animal seems to have been very plentiful in the western half of Southern Africa; now, unless it is still to be found between the Okavango and Cunene rivers, it must be almost extinct in that portion of the country. And this is not to be wondered at when one reads the accounts in Andersson's and Chapman's books of their shooting as many as eight of these animals in one night as they were drinking at a small water-hole; for it must be remembered that these isolated water-holes, at the end of the dry season, represented all the water to be found over an enormous extent of country, and that therefore all the Rhinoceroses that in happier times were distributed over many hundreds of square miles were in times of drought dependent upon perhaps a single pool for their supply of water. In 1877, during several months' hunting in the country to the south of Linyanti, on the river Chobe, I only saw the spoor of two Square-mouthed Rhinoceroses, though in 1874 I had found them fairly plentiful in the same district; whilst in 1879, during eight months spent in hunting on and between the Botletlie, Mababe, Machabe, Sunta, and Upper Chobe rivers, I never even saw the spoor of one of these animals, and all the bushmen that I met with said they were finished.

Elsewhere (in Bryden, 1899, pp. 53-54) Selous says:

> Between 1840 and 1850 all travellers who have left records of their journeys report having found the white rhinoceros very abundant all over the country, wherever there was water, to the north and west of the Limpopo between Secheli's country and Lake Ngami. . . .
>
> C. J. Andersson also found these animals very numerous during his travels between 1850 and 1854 in the country lying to the west and north-west of Lake Ngami, and speaks of killing nearly sixty rhinoceroses of both species during one season. . . . Yet, notwithstanding the great, and in many instances it is to be feared unnecessary, slaughter of white rhinoceroses which has taken place at the hands of Europeans, South Africa is such a vast country, that in many districts these animals might still have been numerous had it not been for the rapid spread of firearms amongst the native tribes, who have carried the war against these easily-killed beasts into their remotest retreats.

One of these animals reported along the Mababi River in 1884 was "the last rhinoceros that I ever heard of in any part of Western South Africa" (Selous, in Bryden, 1899, p. 55).

Southern Rhodesia.—Of this rhino in Southern Rhodesia, Selous (in Bryden, 1899, pp. 54-58) writes:

> At the date of my first visit to South Africa, in 1871, . . . these animals were still numerous in the uninhabited districts of Matabeleland [and] Mashunaland. [In 1872 many were met with northwest of Buluwayo.] Between the Gwelo and Umniati Rivers, I saw white rhinoceroses almost daily, and sometimes as many as six or eight in one day. In 1873 I . . . found

these animals plentiful to the south of the mountainous tract of country which extends eastwards from the Victoria Falls to the junction of the Gwai and Tchangani Rivers. . . .

In the country to the north-east of Matabeleland, between the Sebakwe and the Manyami Rivers, white rhinoceroses were still fairly numerous in 1878, . . . and their numbers only commenced to be seriously reduced after 1880. About that time rhinoceros horns . . . increased very much in value, and . . . the traders in Matabeleland employed natives to shoot rhinoceroses for the sake of their horns . . . and their hides, which were utilized as waggon whips and sjamboks.

One trader alone supplied 400 Matabele native hunters with guns and ammunition, and between 1880 and 1884 his large store always contained great piles of rhinoceros horns, often the spoils of 100 of these animals at one time, although they were constantly being sold to other traders and carried south to Kimberley on their way to England. What caused this sudden demand for short rhinoceros horns from 1880 to 1885 I do not know. But this freak of fashion in knife handles, combs, or what not sounded the death-knell to the white and black rhinoceros alike in all the country that came within reach of the Matabele native hunters. [From 1892 to 1895 several of the few remaining animals between Salisbury and the Zambesi were killed. Perhaps a dozen survived by 1899.]

"Possibly a few may still linger, in the neighbourhood of the Angwa River in Northern Mashonaland" (Selous, 1914, p. 15).

"I have very definite information that about 7 of these animals still exist on the Portuguese-Nuenetsi Border; they have not been seen by Europeans, but well-trained native shikaris have reported them on several occasions" (J. F. Fleming, 1931, in Shortridge, 1934, vol. 1, p. 426).

"It is rumoured that a few still exist in that locality [between the Umniati and Hunyani Rivers], but . . . only native information is available . . . . Many white people visiting the area and even those stationed in it declare that there are white Rhino present today but no concrete proof . . . can be obtained. It is also rumoured that a few white Rhino exist on the Portuguese Rhodesia border near Nuanetsi Ranch . . . . The areas in which the animals may still exist are both inaccessible and in the case of the Umniati area . . . there is a danger of sleeping sickness; these conditions serve to protect all fauna and the white Rhino as well should it still exist. Legally considered as 'Royal Game.'" (Game Warden, Wankie Game Reserve, *in litt.*, March, 1937.)

Transvaal.—Harris (1839, pp. 160, 174, 221) found numbers of this species along the Marico and Crocodile Rivers. On one occasion, in a distance of half a mile, "we counted no less than twenty-two of the white species of rhinoceros."

"In 1871 . . . these animals were still numerous in . . . certain portions of the Eastern and South-Eastern Transvaal. . . .

"The flesh of the white rhinoceros was always considered by both

Dutch and English hunters to be superior to that of any other game animal in South Africa, and in this verdict I entirely agree." (Selous, in Bryden, 1899, pp. 52-54, 64.) Elsewhere (1914, pp. 14-15) Selous writes:

> The emigrant Boers first encountered the white rhinoceros just north of the Vaal River on the open grassy downs, where the towns of Klerksdorp and Potchefstroom now stand, and I have had the actual spots pointed out to me by old Boer "voortrekkers". . . . In those days these huge pachyderms were practically without enemies, for, with the exception of the small number which fell into native pitfalls, very few could have been killed, and before the advent of the European hunter with his death-dealing fire-arms, the species must have increased almost to the limit of its food supply. Within fifty years, however, of the time when Cornwallis Harris had met with the white rhinoceros in almost incredible numbers, . . . thousands upon thousands of these huge creatures were killed by white hunters, and natives armed with the white man's weapons, and the species had become practically extinct.

Natal.—"In 1894 . . . a few of these animals were discovered to be still surviving in a corner of Zululand, and it is said that six of them were shot there during that year" (Selous, in Bryden, 1899, p. 58).

"There are still said to be a few surviving in Zululand, where they are very strictly preserved, and where, perhaps, they may have a chance of increasing if proper precautions are observed" (W. L. Sclater, 1900, vol. 1, p. 302).

Vaughan-Kirby (1920) gives the following information:

> In Zululand, at the present day, the white rhinoceros is to be found only in the Mfolozi Game Reserve . . . and in a narrow strip of country along the south bank [of the White Mfolozi River].
>
> From time to time evidence has been adduced which indicates that there may be a few of these animals, probably not exceeding five or six in number, in the dense bush at the north end of False Bay. (P. 225.)
>
> They are frequently accompanied by the "Tick-birds" (*Buphagus erythrorhynchus*) and sometimes by the Buff-backed and the Little Egrets (*Bubulcus ibis* and *Herodias garzetta*). The former scramble about all over the huge animals, exactly as they do upon cattle, and as they are particularly wide-awake birds it is very difficult to approach their host when they are present, as they invariably . . . sound a warning of which even this dull-witted pachyderm never fails to avail itself. The egrets sedately follow up the rhinoceroses as they move, and may frequently be seen taking ticks from under the animal's belly. (P. 240.)

"There are only some twenty of this southern sub-species now remaining in the world. They are . . . confined in . . . the Umvolosi Reserve. They have been and still are in the greatest peril of extinction at the hands of the neighbouring settlers, some of whom resent their presence because to it and that of the other wild animals they ascribe the continued existence of the tsetse fly in the locality. Three of these white rhinos were illegally killed in 1928, and in the 'game drive' of 1921 five are said to have been shot." (Jour. Soc. Preservation Fauna Empire, pt. 9, 1929.)

In and near the Umfolosi Reserve "the animals have bred well during the year and there are now just over 200.

"The White Rhino have apparently come to stay in the Hluhluwe Reserve. A recent census shows that at least eleven adults and two calves are at present resident there." (Ann. Rept. for 1933 of H. B. Potter, Game Conservator, Zululand.)

"There are about 200 of these animals now, and it is estimated that they are increasing at the rate of about 30 each year. . . . At least 40 were in the area lying between the Umfolosi and Hluhluwe Reserves, which area we hope to add to the Reserves. The remaining 60 of the wanderers were on the Crown lands to the west of the Umfolosi Reserve adjoining the Mahlabatini Native Reserve, which cannot be used as a Game Reserve." (Charter, 1934, p. 2.)

"There were terrific droughts from 1931 to 1933 in this portion of Zululand. According to some reports most of the rhinoceroses wandered about aimlessly and a few died and were killed." (Herbert Lang, *in litt.*, January 23, 1935.)

The present range is limited to the area surrounding and including the Umfolozi and Hluhluwe Game Reserves. The number is estimated at between 250 and 300. Depletion took place before the Natal game laws were enforced in Zululand in 1906. The horn can be used to make handles for walking sticks and also for other ornaments. (Administrator's Office, Natal, *in litt.*, December, 1936.)

"This rhinoceros for the time being may be regared as in a fairly firm position" (Dollman, 1937, pp. 73-74).

Both subspecies of the White Rhinoceros are accorded full protection under Schedule A of the London Convention of 1933.

Northern White Rhinoceros; Nile White Rhinoceros. Rhinocéros blanc du Soudan (Fr.)

CERATOTHERIUM SIMUM COTTONI (Lydekker)

Rhinoceros simus cottoni Lydekker, Field, vol. 111, no. 2878, p. 319, 1908. ("The Lado district of Equatorial Central Africa"; type locality said by Heller (1913, p. 29) to be "some distance north of the station of Kiro, almost precisely on the northern boundary of the Lado Enclave.")

FIGS.: Trouessart, 1909, pls. 29-31; Roosevelt, 1910, pls. facing pp. 400, 414, 420, 422, 428; Heller, 1913, pls. 1, 6-9, 31 (figs. 2-5); Roosevelt and Heller, 1914, vol. 2, pl. facing p. 664; Selous, 1914, pl. 2, left-hand fig.; Lydekker, 1916, vol. 5, p. 57, fig. 20; Lang, 1920, pp. 65-92, figs., and 1923, pl. 16; Brocklehurst, 1931, frontisp. and pls. facing pp. 107, 108, and 110; Lavauden, 1934, pl. 15; Ward, 1935, pp. 342, 346, figs.; Am. Mus. Nat. Hist. Sci. Guide 118, ed. 2, p. 106, fig., 1943.

About 15 years ago the Northern White Rhinoceros was much persecuted, and fears were expressed concerning its survival. Its status in the northeast of the Belgian Congo is still unsatisfactory,

but of late it has been well protected in the Anglo-Egyptian Sudan and Uganda, and its future there seems assured. A small number survive in the Ubangi-Shari Territory of French Equatorial Africa along the Sudan frontier.

"The Nile race resembles very closely, in external appearence and size, the southern race . . . . It differs, however, by the possession of a flatter dorsal outline to the skull . . . and by the smaller size of the teeth. The measurements of skulls of the two races show them to

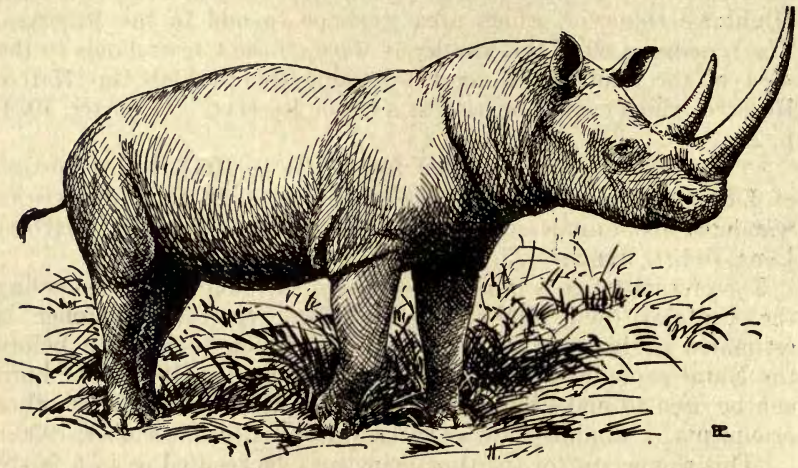

FIG. 42.—Northern White Rhinoceros (*Ceratotherium simum cottoni*). After Lang.

be of practically the same bodily size. . . . Height at shoulders, 5 feet 8 inches." (Roosevelt and Heller, 1914, vol. 2, pp. 662, 670). Record length of front horn, 45¾ inches (Ward, 1935, p. 347).

"The range . . . was believed to be restricted to the Lado country and the immediate neighborhood of the Nile. Contrary to all surmises its range has steadily increased. These white rhinoceroses are now positively known to extend from a little north of Lake Albert to three hundred miles down the Nile to a point near Shambe. From there it stretches four hundred and fifty miles westward to the Dar Fertit section, and two hundred miles south to Rafai [on the Bomu River at about long. 24° E.]. The southern limit extends about five hundred miles across the northeastern Uele district to the territory northwest of Lake Albert. This habitat thus forms an oblong area of about 100,000 square miles, all situated west of the Nile." (Lang, 1920, p. 76.) This range corresponds more or less to the eastern portion of the Ubangi-Uele Savanna District of Chapin (1932, p. 90) or the Ubangi Savanna District of Bowen (1933, pp. 256, 258).

Distributional maps are provided by Heller (1913, pl. 11), Roosevelt and Heller (1914, vol. 2, p. 671), Lang (1920, p. 77, and 1923, p. 156), and Lavauden (1933, pl. facing p. 24, and 1934, p. 431, fig. 45).

Anglo-Egyptian Sudan.—"By his account published in 1869 von Heuglin was actually the first who recorded the presence of the West Nile race of square-lipped rhinoceros" (Lang, 1923, p. 158).

According to Heller (1913, p. 34), "the first real evidence of its occurrence to the north of the Zambesi River was the skull procured in 1900 by Major Gibbons in the Lado Enclave." He seriously questions "the earlier reports . . . by Speke, Grant, Von Höhnel, Gregory, and others. . . . There is little doubt but that all their records referred to the black rhino." He continues (pp. 36-38):

> The square-nosed rhinoceros is found at the present time in a wild state only in the Lado Enclave and the Bahr-el-Ghazal province of equatorial Africa. . . .
>
> In the Lado Enclave they are confined to the immediate vicinity of the western bank. . . . Very little is yet known of their distribution westward. The farthest point inland where they were met by Colonel Roosevelt was . . . approximately 12 miles west of Rhino Camp. [This part of the former Lado Enclave is now included in Uganda.] In this vicinity nine were seen by Colonel Roosevelt in one day's journey . . . . A few days later Kermit Roosevelt encountered 10 in the same general neighborhood. . . . The known distribution of the white rhinoceros covers the two widely separated localities of Lado Station and Rhino Camp, which are some 120 miles apart, and the more distant Dar Fertit country. . . .
>
> There is little doubt but that the species is quite local in distribution, and to this circumstance its long escape from discovery is to be attributed.

"During Mr. A. L. Butler's direction of the Game Department of the Sudan Government the white rhinoceros was placed on the 'Protected List'—that is, the killing of it was absolutely prohibited. But since his retirement in 1914 the poor remnant of rhinos that still survive along the west bank of the Upper Nile have been replaced on the 'Game List,' in respect of a paltry premium of £5. Unless that wicked action is reversed it spells the death warrant of the few white rhinos that remain on the Nile." (Chapman, 1922, p. 44.)

"The case of the white rhino . . . is a pretty hopeless one. He obviously belongs to another world, and his extinction in this is fairly certain in the near future. In the British Sudan very few individuals remain. Those along the west bank of the Nile can, I should fancy, not exceed half-a-dozen pairs.

"A little farther westward, along the Nile-Congo Divide, from about Yei in Western Mongala, to a point some distance northwest of Tembura in the Bahr-el-Ghazal, they are more numerous, especially in that section of the divide between Meridi and Yambio. In that district in 1916 I came upon them many times in my rambles." (Christy, 1923, p. 63.)

Brocklehurst (1931, p. 109) writes:

> It is still comparatively plentiful in certain parts of Uganda and the Sudan, west of the Nile, and owing to their strict preservation they are certainly on the increase. In one year, in Mongalla Province alone, I have seen no less than eight cows accompanied by calves. The natives seldom kill them now as it is not easy to kill so rare a beast without the fact being known sooner or later by the District Commissioner, who inflicts a heavy punishment on anyone infringing the law.
>
> Owing to the fact that the cow carries the longest horn, they were more sought after by hunters, which would account for their rapid decrease and almost entire extermination. . . .
>
> Unlike the Black Rhinoceros they are extremely inoffensive, depending entirely on scent and almost invariably seek safety in flight.

French Equatorial Africa.—The occurrence of the White Rhinoceros in this country has only recently been verified. When Lang states (1924, p. 177) that "no square-lipped rhinoceros is known from the Ubangi-Shari region," he contradicts his previous testimony (1920, p. 76) and is in obvious error.

"Two horns [presumably of the White Rhinoceros], now in the British Museum, were brought from the neighbourhood of Lake Tchad by Messrs. Denham and Clapperton in the first quarter of the last century" (Lydekker, 1908, p. 37).

In 1927 G. Babault recorded seeing at Khartum a lot of more than 150 White Rhinoceros horns, which had come from the general region of Abécher in eastern Chad Territory and had been collected in the course of a year. The animal still exists (unfortunately in small numbers) to the southeast of Abécher, in the regions of Goz-Beïda and Mongororo. There are also records from eastward of Mangueigne (near the Aouk River) and from the eastern part of Ubangi-Shari (near Yalinga). A recent decree protects the animal absolutely in French Equatorial Africa. (Lavauden, 1933, p. 24.)

It is certain that seven or eight years ago this animal was found between Birao (northeastern Ubangi-Shari) and Lake Mamoum, and at the junction of the Aouk River with the Bahrs Ouandja and Gunda. At present there are probably no White Rhinoceroses within the limits of Chad Territory. Possibly, however, there are a few survivors in the east of the Ubangi, between Birao and Zemio. (Malbrant, 1936, p. 26.)

Formerly there were some hundreds along the Sudan frontier, about the headwaters of the tributaries on the right bank of the Mbomu and on the left bank of the Aouk. There are now a few individuals in the same region. Depletion is due to the trade in horns. The animal has been totally protected since 1916. There ought to be a few individuals in the Parc National du Goz Sassulkou and in the game reserves of Ouanda-Djale and Zemango. (L. Blancou, *in litt.*, December, 1936.)

Belgian Congo.—From Lang's excellent and comprehensive account (1920) the following excerpts are taken:

The habitat of these white rhinoceroses lies in the northeastern savannah of the Belgian Congo, and beyond it to the Nile (p. 69).

[They evidently suffered from the rinderpest that] swept across Africa from the northeast in the early nineties . . . . Only in the last ten years have the white rhinoceroses and other game become sufficiently numerous in that section to figure once more in the natives' larder. (P. 77.)

[In the territory of Maruka, the great chief of the Logo], the regular annual toll of white rhinoceroses killed by natives for meat exceeded forty (p. 78). [Twenty-nine had fallen to the spear of a single Azande hunter (p. 80).]

With the exception of man they have no enemies but lions and leopards, which prowl about seeking their young. Near the crossing in a papyrus swamp we came upon the remains of a calf that had been overpowered by two leopards, and later feasted upon by hyenas. (Pp. 87-88.)

Reproduction is . . . unexpectedly rapid . . . . Often troops of five included, besides the adults, a calf, a three-quarter grown and another still youthful member. (P. 88.)

Among the smaller pests that may inconvenience white rhinoceroses are various ticks . . . . They chiefly infest the softer, wrinkled parts of the hide . . . . Credited with removing these insects are the oxpeckers (*Buphagus africanus*). (P. 88.)

[A] minute, blood-sucking fly (*Lyperosia*) is a characteristic companion, constantly hovering in great swarms about their huge prey. . . . The hides of rhinoceroses have thousands of little injuries whose exudations furnish ample nourishment for these insects.

More remarkable still is an oestrid fly (*Gyrostigma pavesii*), whose grub-like larvae often cover large portions of the stomach lining . . . .

Intestinal parasites, especially round worms (nematodes) are numerous, and most noteworthy is a . . . tape worm (*Taenia*). (P. 89.)

What has indirectly contributed more than anything else to the gradual extermination of the white rhinoceros are the horns . . . . They made the horn-bearer a danger, and the horns could be sold. Greek and Hindu traders were ready to buy them at the value of ivory which has proven so fatal to the elephant. Superstitions of peoples in far off Asia made a market for horns, at good prices. Greasy and sleek humanity . . . has been willing to guarantee health to those stolidly believing, so long as the mere powder and scrapings from rhino horns sufficed. The craze among native chiefs to own a horn staff of unsurpassed length helped decimate the white rhinoceroses in South Africa.

White man, too, has bid for these rarities, and not in vain. Polished and scraped into canes, gold-topped and diamond encrusted, these horns become valuable "curios." Amulets to keep away witchcraft were carved easily, and worn willingly. A cup turned out of rhinoceros horn was believed to splinter at the mere touch of obscure poison . . . . Now statuettes and other bric-a-brac, fashioned by artists of many lands, still delight those eager for quaint trinkets.

The many-thonged slave-trader's lash cut out of rhinoceros hide now finds its counterpart in the dainty horse-whip of the more refined. The hide, raw or burnished, or given an amber-like appearance and polish, is often transformed into queer-looking tables, trays, and smaller objects. . . . And finally, industry has found that disks cut from the hide and put on the lathe give a high polish and stand great wear. (Pp. 89-90.)

Fortunately the white rhinoceroses of the Congo-Nile race have little of the aggressiveness that makes the black form so dangerous a brute. Their realm lies far remote from civilization, and they leisurely roam over regions wherein the call of forward struggling civilization is still faint. They are protected by the natural indolence of natives, and the commercial poverty of nature. They have a fair chance to survive the native spear, but not modern gun and powder, and today the negro marvels at the small bullet that brings him so easy and big an exchange in meat.

Judging from observations made by others and ourselves, from 2000 to 3000 white rhinoceroses may still be alive in the entire northern range. Just how rapidly their numbers will decrease, depends upon the protection afforded them. . . . Perhaps complete restrictions to traffic in the horns of white rhinoceroses would be the most important step toward saving [them from extinction]. (Pp. 90-91.)

Christy (1923, pp. 64-65) writes of his experiences:

In 1916 on the Congo side of the Divide, especially in the district opposite the Meridi-Yambio section, I found the species individually was much more common than anywhere on the British side. . . . In a Greek store at Aba . . . I was shown a pile of at least a hundred rhino horns, worth from £1 to £3 apiece, I think the trader told me, but which he could not sell owing to the restrictions put upon their sale in, or transit through, the Sudan.

Westward of Aba, and more or less throughout the Haut Uele district north of the Uele river, I came upon the animals . . . almost daily. . . .

The small region in the Congo in which the animal is commonest is almost uninhabited, and it would not be difficult for the Congo Administration to enforce upon Chief Bwendi . . . a prohibition in favour of this interesting species, forbidding at the same time the sale of rhino horn throughout the Congo.

Lang writes again (1924, pp. 176-177):

There is little fear of the destruction of these rhinoceroses by natives armed with spears, as Christy supposes; the danger lies in gun and powder of which there is always an abundance, of either lawful or smuggled provenance. The few Azande hunters, justly famed among the tribes for dangerous exploits, are admired as much for killing a rhinoceros with a spear as an elephant or a buffalo . . . . These rhinoceroses are of course attacked when sleeping. . . .

There seems to be no effective means at present of stopping the wholesale slaughter of this northern form. Its meat is one of the important parts of the native diet, procurable at all times without much difficulty. Even though the principal chiefs were willing to enforce protection there would still be a great number of native poachers and such a law would never be adequately respected. To properly police these vast areas is practically impossible.

The situation would be helped in part by the more drastic enforcement as regards confiscations and fines for the transportation, sale and exportation of the horns and pieces of hide. Khartum is the great center at present for the exportation of horns to the Orient and for the manufacture therefrom of articles sought alike by sportsmen and curio collectors.

A recent decree provides that all Rhino horns in the Belgian Congo, however acquired, shall become the property of the State. Previously it had been lawful to kill an "attacking" Rhinoceros and to keep the horns of one so killed. (Schouteden, 1927, p. [30].)

A. J. Jobaert writes (*in litt.*, November 10, 1936): "Eleven years ago, competent naturalists estimated that there could not remain more than 40-60 Rhinoceroses in the Belgian Congo. In the last 15 years I do not believe that more than 20 of these animals have been killed by Europeans, in each case under special permit. But the increase in the value of the horns led to an intensive demand on the part of the traders, and apparently to an incessant hunting on the part of the natives. The animal is officially protected, but the possession, transport, sale, and even export of skins are not forbidden. The animal is now respected only by the conscientious European hunter, and is on the verge of extinction in the Belgian Congo. The only means of saving it, that I can see, is the establishment of its range as a game reserve, with adequate supervision."

Uganda.—"The existence of the square-lipped rhinoceros in the Nile Province of the Uganda Protectorate is now proved" (Johnston, 1902, p. 374). This statement, however, lacks substantiation, since there is no authentic record from east of the Nile, where the Nile Province of that period was located.

The 14 specimens secured by the Smithsonian African Expedition in 1910 came from the vicinity of Rhino Camp, on the west bank of the Nile, in the southern portion of the Lado Enclave of that time. This region is now included in Uganda.

In Uganda the range "does not extend more than probably forty miles along the left or west bank of the Nile above Nimule, and, say, fifteen miles inland. This range is remote from any European settled area, and is very sparsely inhabited by primitive natives, who possess very few firearms. . . . I believe that poaching is now almost non-existent." (Coryndon, 1921, p. 28.)

In his annual report for 1925, the Game Warden of Uganda writes:

> Every endeavour has been made to put a stop to the illegal destruction of this animal by the natives and the result is distinctly gratifying.
>
> During the year under review two white rhinoceros fell into a deep salt-lick in West Madia and were drowned. Also, a certain number of these animals probably fall victims to game-pits. . . .
>
> The result of the first census leads to the belief that there are possibly no more than 150 of these grand animals left in Uganda at the present time.
>
> The persecution of the white rhinoceros is as good an instance as any of the deplorable results which are likely to occur from killing game for profit, for I understand that prior to the demand for rhinoceros horn this species was scarcely molested.

Three years later a marked diminution was noticed. The total number in Uganda was then estimated at 130. (Ann. Rept. Uganda Game Dept., 1928.)

"Next to the gorilla this ranks as Uganda's most interesting mammal. Its habitat is restricted to the West Nile district where it is believed about 150 examples still remain.

"The range is unchanged, and there are no data to indicate whether present-day numbers reveal a marked reduction. It is possible that formerly 250 to 300 of these prehistoric monsters roamed this locality.

"Between ten and thirty years ago it is unquestionable that numerous white rhinoceros were slaughtered by the natives to meet the ever-increasing demands of the Far East for rhinoceros horns . . . . To a far lesser extent examples were sometimes hunted by the natives for meat.

"The white rhinoceros . . . enjoys complete protection and not even a Governor's permit is granted to collect specimens for scientific purposes. For nearly ten years this species has enjoyed absolute immunity from molestation, and the measures adopted for its protection have proved most effective." (Game Warden, Uganda, *in litt.*, December, 1936.)

Order ARTIODACTYLA: Even-toed Ungulates

Family HIPPOPOTAMIDAE: Hippopotamuses

This family consists of two genera (*Choeropsis* and *Hippopotamus*), with one species in each. The latter, however, is divided into five subspecies. The various forms are widely distributed over Africa south of the Sahara. All are treated in the following pages.

Northern Hippopotamus

HIPPOPOTAMUS AMPHIBIUS AMPHIBIUS Linnaeus

Hippopotamus amphibius Linnaeus, Syst. Naturae, ed. 10, vol. 1, p. 74, 1758. (Nile River, Egypt.)

Cape Hippopotamus

HIPPOPOTAMUS AMPHIBIUS CAPENSIS Desmoulins

Hippopotamus capensis Desmoulins, Dictionn. Classique Hist. Nat., vol. 8, p. 222, 1825. (Lower Berg River, western Cape of Good Hope.)

Angola Hippopotamus

HIPPOPOTAMUS AMPHIBIUS CONSTRICTUS Miller

Hippopotamus constrictus Miller, Smithsonian Misc. Coll., vol. 54, no. 7, p. 1, pls. 1-4, July 1924. (Angola.)

East African Hippopotamus

HIPPOPOTAMUS AMPHIBIUS KIBOKO Heller

Hippopotamus amphibius kiboko Heller, Smithsonian Misc. Coll., vol. 61, no. 22, p. 1, Jan. 26, 1914. (Lake Naivasha, Kenya Colony.)