



DISTRIBUTION OF INDIAN ONE-HORNED RHINOCEROS

(*Rhinoceros unicornis*)

by Anwar uddin Choudhury

Historical Distribution

The Indian one-horned rhinoceros (*Rhinoceros unicornis*) once ranged throughout northern India from Peshawar in the west to Myitkina (Burma) in the east. The Indus Valley (Pakistan) was once the home of the one-horned rhino about 5,000 years ago, during the Mohenjo Daro era. The remains of rhinoceros have also been discovered in far away places like Gujarat (Clutton-Brock 1965; Momin et al. 1973). The Moslem travellers Al-Biruni (c. 1030) and Ibn Battuta (c. 1334) mentioned rhino in their accounts of western and northern India. It is recorded in history that Emperor Timur Lane, who invaded India, hunted many rhinos on the frontier of Kashmir in 1398 A.D. In the days of Mughal Emperor Babur

(1505-1530) the rhino also existed in most parts of Gangetic U.P. (Uttar Pradesh). Emperor Akbar, whose memoirs were written in 1590, reported the presence of rhino in the Moradabad district (Sambhal area) while Emperor Jehangir's memoir mentions the occurrence of rhino near Aligarh. The Indian rhino has also been recorded in Sylhet (Bangladesh) and Cachar (Rookmaaker 1980).

Present Distribution

Mostly as a result of habitat destruction and climatic changes, the Indian rhinoceros gradually disappeared from most parts of its former range and by the 19th century survived only in the Terai grassland of northern U.P., southern Nepal, northern

Bihar, northern Bengal and the Brahmaputra valley of Assam. It might have also existed in upper Burma as it was recorded at Bumpha Bum in Myitkina district in 1962 (Yin 1967). In all the places where rhinos occurred, its favored habitat was wet grassland. By 1900 their territory had further shrunk and they vanished from U.P. In fact, the last recorded rhino shot within U.P. territory was in 1878 near Pilhibit.

Today, the rhino is confined to a few pockets in southern Nepal, north Bengal and the Brahmaputra valley of Assam. Sightings of rhino are often reported from Bhutan, Arunachal Pradesh and Nagaland. These are actually the animals that frequently cross over the international or interstate boundaries in areas where the habitat is still contiguous. Most of the pockets where rhinos are found have been preserved and made into national parks and wildlife sanctuaries.

Nepal

In Nepal, most of the rhino population is confined to the Royal Chitwan National Park. Situated in the famous 'Terai' forest, the park encompasses an area of about 1,300 square kilometres, of which only about 20% harbours ideal rhino habitat. The present population of rhinos in Chitwan is around 400, which represents the second largest concentration after those in Kaziranga. The estimated population for Chitwan and the surrounding areas was 160 in 1960 and 185 in 1962.

North Bengal

Two small pockets of Jalpaiguri district are the only home of rhinoceros in north Bengal. Both areas are wildlife sanctuaries and are thus protected. The movement of rhinos from these two sanctuaries to neighbouring Darjeeling, Coch Behar and the Bangladesh districts of Rangur and Dinajpur has virtually ceased. Jaldapara, with an area of about 116 square kilometres, is the bigger sanctuary while the other, i.e. Gorumara Wildlife Sanctuary, is only 8.6 square kilometres in area.

The jungle and grass in Jaldapara are thicker than in Kaziranga. Though it is regarded as a good rhino habitat, the population here is showing a declining trend and the possibility of inbreeding has become greater. The estimated population in 1964 was 40-60, which dropped down sharply to 23 in 1975. Though strict preservation measures were taken, this further decreased to 22 in 1980 and 20 in 1981. The local authorities put the blame on the comparatively larger tiger population in Jaldapara and partly on poachers, while naturalists place the responsibility on inadequate protection by forest officials. Large-scale encroachments have also been made into

the Sanctuary in addition to 'army pockets' within the Sanctuary. The Government of West Bengal has already asked the army authorities to move out of the main sanctuary.

The rhino population in Gorumara Wildlife Sanctuary was 8 in 1978, which increased to 11 in 1980. The area here is too small to be a viable rhino habitat. Moreover, four railway stations are located within this tiny sanctuary.

Assam

The bulk of the surviving Indian one-horned rhino population are found in the grasslands of Assam's Brahmaputra valley. The population is not contiguous and is scattered over large parts of the valley. During high floods many rhinos take shelter in the hills or plateau slopes. Most of the areas where rhinos are found are now wildlife sanctuaries. Kaziranga National Park, Manas Tiger Reserve, Orang, Laokhowa, Pabitora and Sonai Rupai Wildlife Sanctuaries are the main rhino reserves. There are also some areas outside the sanctuaries which harbour rhino.

World famous Kaziranga National Park has the distinction of holding the largest single concentration of Indian rhinos. Situated between the mighty river Brahmaputra and the Karbi plateau, (formerly Mirkir Hills) the park covers 430 sq. kms. in area. It is the largest unspoilt and unoccupied grassy area of the Brahmaputra valley.

In 1908 there were a few dozen rhinos left in Kaziranga (Gee 1964). In 1926 Kaziranga became a 'game sanctuary' and in 1940 it was given 'wildlife sanctuary' status. Finally in 1972 Kaziranga became a 'national park'. Due to the various efforts of the authorities, the rhino population in Kaziranga gradually increased. According to the 1966 census the rhino population in the park was 400. It further increased to 670 and then 960 at the times of the 1972 and 1978 censuses, respectively. The growth rate between 1966-72 and 1972-78 was 67.5% and 43.3% respectively. The latest census figures (1984) show a further improvement in the rhino population. The total number is put at 1,195. Though the absolute number increased, the growth rate showed a setback, i.e. only 24.5%. It may be mentioned here that the poachers reigned supreme during the Assam disturbances on the foreigners issue (1980-83) when most of the guards were withdrawn for law and order duty.

The distribution within the park is also uneven. The bulk of the rhinos are concentrated in the western and southern parts of the park. The density of rhino in Kaziranga as per the 1984 census is 2.78

per sq. km.

In March 1984 while on a visit to Kaziranga, the author spotted 12–13 rhinos in a small area of about 4 sq. kms. around Mihimukh, which gives a density of 3.13 per sq. km., more than the park average.

During floods most of the plain areas of the park are under water and the rhinos, along with other animals, take shelter in the national highway that runs through the south of the park and in the foothills of Karbi plateau. The forest department has built a number of earthen platforms, each 600 ft. long and 30 ft. wide, having a height of 10 ft., where a large number of animals take shelter during the floods.

Manas Tiger Reserve is one of the biggest wildlife sanctuaries in India with an area of 2,840 sq. kms., stretching from Sankosh river in the west to the Dhansiri river in the east. Though an excellent rhino country the population there is not that high. E.P. Gee (1964) estimated a population of 10–15 rhinos in the core area around the Manas river and 2–3 more towards the extreme western end near the Sankosh river. But the situation now is different and after becoming a tiger reserve stricter conservation measures were undertaken. The rhino population was estimated to be 75 in 1980.

Orang, Laokhowa and Pabitara are three small sanctuaries exclusively set up for the preservation of rhino. Orang is situated on the north bank of the Brahmaputra towards the southeast of Manas and has an area of 65 sq. kms. The estimated rhino population was 35 in 1972, which further improved in 1981 to a figure of 60.

In 1981, 73 rhinos were estimated to be present in Laokhowa (area 70 sq. kms.). It was reported that the bulk of the rhinos in Laokhowa were killed by poachers during the last few years. In the first five months of 1983, as many as 31 rhinos were killed in Laokhowa by poachers.

Pabitara is a small sanctuary situated at a distance of about 30 kms. east of Gauhati, having an area of only 16 sq. kms. Pabitara has an exceptionally high density of rhinos. It is believed that presently there are 67 rhinos in the sanctuary, which means a density of 4.2 rhinos per sq. km. as against Kaziranga's 2.8. The Government of Assam has decided to upgrade the sanctuary into a national park.

Sonai Rupai is another wildlife sanctuary where a small rhino population exists. Nestled at the foot of the Arunachal Himalayas, it covers an area of 195 sq. kms.

Besides these sanctuaries there are some other areas (including some reserved forests) where rhinos occur. Kurva, a small pocket near Gauhati has a small

population of rhino. Mandakata, another very small pocket just to the west of Kurva also has a few resident rhinos. As these sites are very small and surrounded by human habitations, often villagers are injured by the rhinos.

A few rhinos are also found in Burhachapari Reserved Forest (44.1 sq. kms. in area) near Laokhowa. Panpur Reserved Forest (6.1 sq. kms.) situated on the other side of the Brahmaputra, north of Kaziranga National Park, is regularly visited by rhinos from the famous national park. Small groups of rhino inhabit the Rangali (near Sonari) and Desangmukh (38 sq. kms.) forests in Sibsagar district.

Just to the west of Kaziranga lies Kukrakata Hill, a small hilly reserved forest which has a resident rhino population of about two dozen animals. During the high floods another dozen or so rhinos also move over from the main park.

Outside the Brahmaputra valley, rhinos are often seen on the northern slopes of the east Karbi plateau, which is adjacent to Kaziranga. Rhino also once occurred in the far southern district of Cachar (Rookmaaker 1980).

Arunachal Pradesh, Nagaland, and Meghalaya

Arunachal Pradesh is by and large not an ideal rhino habitat, but rhinos are often sighted in those areas of Kameng district which lie adjacent to Sonai-Rupai Wildlife Sanctuary of Assam. Footprints of rhinos have been observed in the upper Dehing valley (near Namdapha Tiger Reserve) in Tirap district (Gee 1964). E.P. Gee (1964) also reported that in the southern part of Tirap district a few isolated rhinos have sometimes been encountered.

Like Arunachal Pradesh, Nagaland is also a hilly area and does not any good rhino habitat. Sometimes stray individuals have been sighted in border zones near Sonari (Rangali Reserve Forest) in Assam, where a small population is believed to exist.

The only record of rhino from Meghalaya is one dead specimen recorded in the Northern Jaintia Hills a few years ago.

Bhutan, Bangladesh and Burma

In Bhutan, rhinos are frequently seen in the Manas Tiger Reserve, which is contiguous with the Indian tiger reserve of Manas. The rhinos are mostly seen in the narrow plain area along both sides of the Manas river, as the other areas are mostly hilly (part of the Himalayan foothills).

In the past, stray sightings of rhinos from north Bengal to Rangpur and Dinajpur districts of Bangladesh were not uncommon, but no authentic record is available at hand. Formerly rhino also existed in

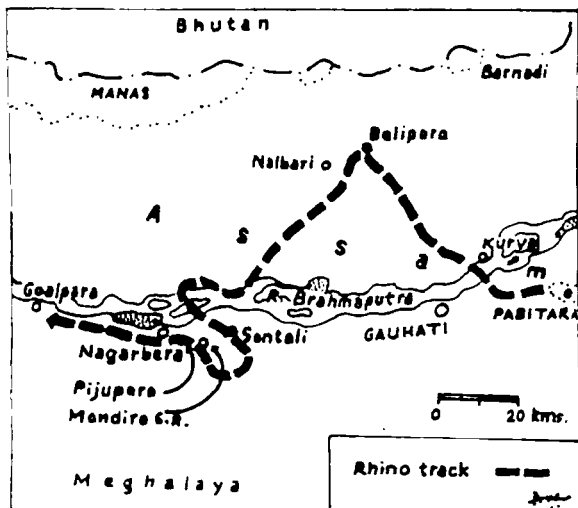
Sylhet district (Rookmaaker (1980).

Burma is actually outside the normal range of the Indian rhino, but in 1962 a specimen was recorded at Bumpha Bum in Myitkina district (Yin 1967). So far no further information on the occurrence of Indian rhinos has been reported from Burma. The animal reported on might have migrated from the Tirap area of Arunachal Pradesh (India).

Tracking Rhino Movement

On January 23, 1984 the author saw a female rhino near Nagarbera village (about 100 kms. west of Gauhati). This rhino is believed to have left Pabitara Wildlife Sanctuary towards the end of December 1983 along with a male. Subsequently the male was killed and the female wounded by a poacher. On January 2, 1984, the female suddenly appeared in a village called Balipara near Nalbari, about 70 kms. northwest of Pabitara. From Balipara the forest department personnel followed its movements as it travelled in a south-westerly direction and crossed the Brahmaputra river to reach Sontali village (January 11), and then moved further south and west until it reached Mandira, a grazing reserve on January 14. On January 17 it appeared in Pijupara village, near Nagarbera. It stayed for several days in Pijupara and then moved west up to Goalpara, where it was ultimately captured in mid-March 1984 and flown to Dudhwa National Park under a translocation programme.

During its long trek the forest department personnel tried to drive the animal towards Kurva or Pabitara, but in vain. All along its route to Goalpara, the rhino was troubled by villagers, which ultimately led to the deaths of 3 persons, besides injuring a few others. This is a fine study of rhino movement as most of its trek was monitored. The animal travelled



Movement of a rhino for about 200 kms.

for about 3 months, in the course of which it covered nearly 200 kms. Had it not been captured for Dudhwa, more new facts on the movement of rhino could have been learned.

Relocated Rhinos

Recently the Governments of India and Pakistan proposed the translocation of some rhinos to selected areas within their former range. The first such translocated animals (a pair) were sent from the Nepal terai to Pakistan's Lal Sohanra National Park on March 23, 1982. The park covers an area of 313.7 sq. kms. and is situated near Bahawalpur.

On April 1, 1984, five rhinos landed in Dudhwa National Park of U.P., thus becoming the first rhinos to be translocated in India. The translocation was mooted under the National Wildlife Action Plan (which gives priority to the reintroduction of endangered and threatened species).

A number of places were selected for translocating rhinos from Assam. Dudhwa National Park in U.P., Champaran forest in Bihar, Jaldapara and Gorumara Wildlife Sanctuaries in West Bengal, Lali Wildlife Sanctuary in Arunachal Pradesh and Intanki Wildlife Sanctuary in Nagaland.

But Dudhwa has been given first preference. Situated in the Terai belt, the park covers an area of about 613 sq. kms. At least 14 favourite plants (including grasses) of rhino are located in Dudhwa. Of the first five rhinos that were sent, four were captured from the fields outside the Pabitara Wildlife Sanctuary and one from Goalpara.

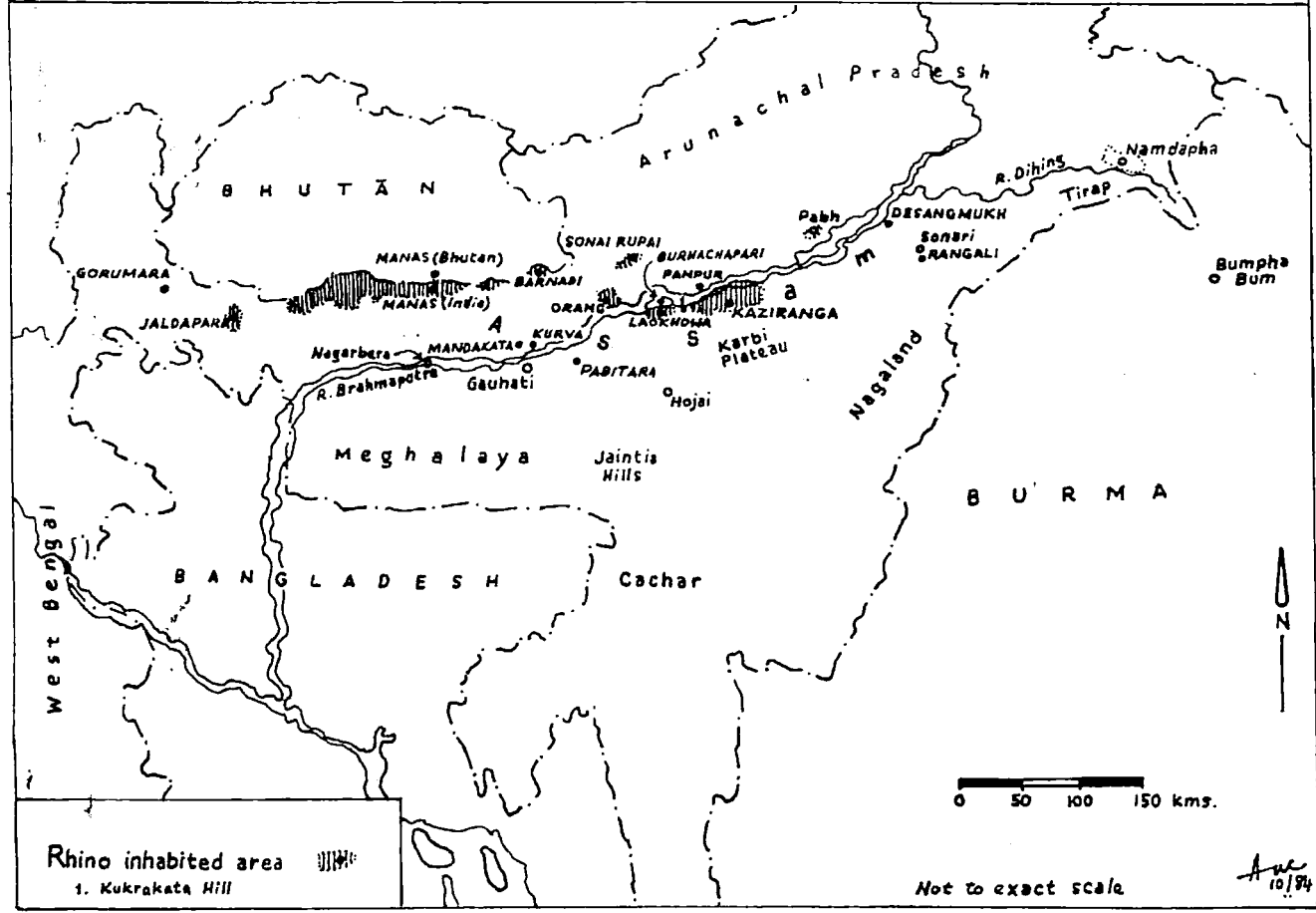
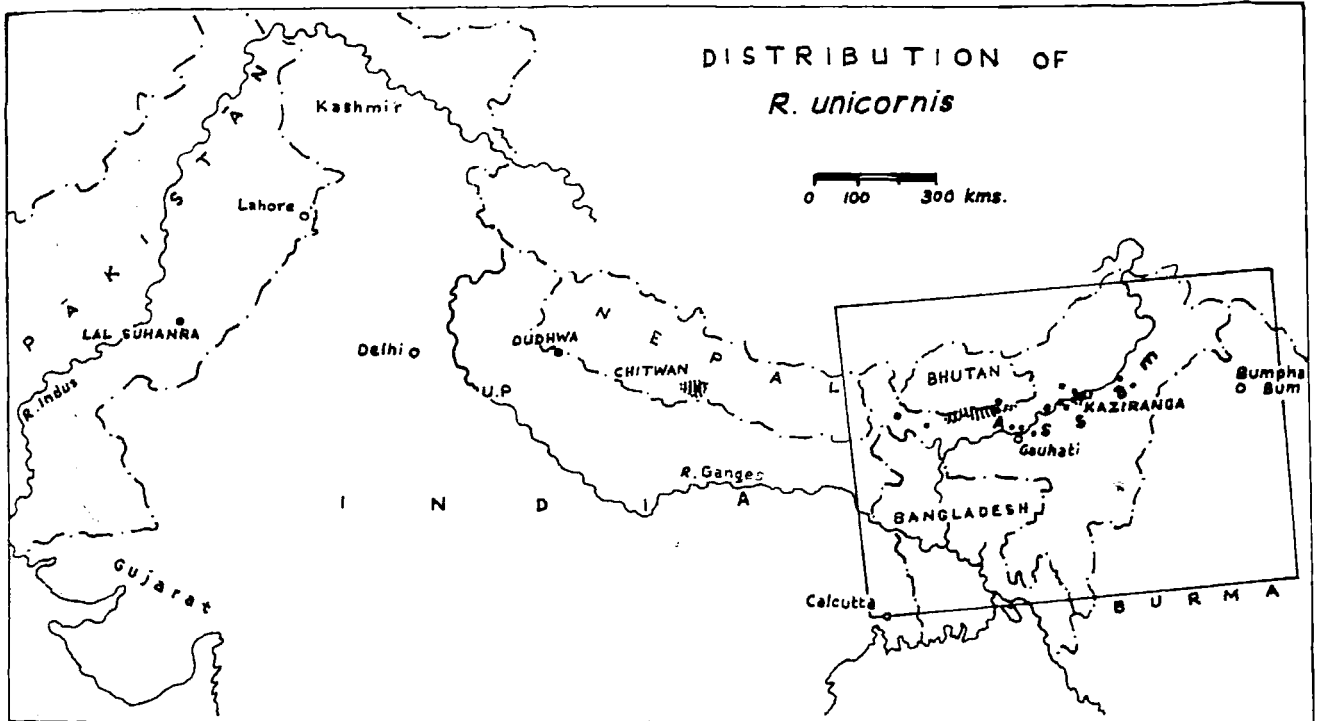
Further translocations will be undertaken only after monitoring the measure of success of those in Dudhwa. Of the five rhinos set free in Dudhwa, two have already succumbed to injuries incurred during capture and transporting.

Conservation Problems

The main threat to the existence of the Indian rhino is poaching for its valuable horn, although habitat destruction is also a great threat. Even in the smaller sanctuaries of north Bengal, 5 rhinos were killed by poachers between 1980-82, and another 3 within the first 5 months of 1983.

In the famous Kaziranga, 25 rhinos were killed in 1981. In the whole of Assam state, as many as 91 rhinos were killed in 1983, of which Laokhowa alone accounted for 31. In the first 6 months of 1984, another 26 rhinos fell into the hands of poachers.

The inability of the authorities to check poaching in Assam and north Bengal is difficult to understand since in the much bigger and more difficult terrain of Chitwan National Park (Nepal), not a



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single rhino fell victim to poachers between 1976–1983. The authorities there have army assistance in patrolling the park.

There are many reasons for the present spree of poaching such as: the lack of sufficient patrol elephants and boats; the negligence of some forest officials (in the last week of May 1984, 42 persons were arrested in Kaziranga on charges of poaching, including one policeman, and two forest guards were also arrested in the early part of 1984); the occasional issue of fishing permits by the civil authorities inside the park (some of the 'fishermen' are poachers in disguise); and the lack of an adequate buffer zone around the reserves.

Discussion

All of the areas where rhinos are found in Assam should be protected as wildlife sanctuaries. Adequate buffer zones should be created around the existing parks and sanctuaries. The boundaries of the reserves should be secured (by electrified fences, etc.) and the management of the wildlife reserves should not be confined solely to the professional foresters; dedicated naturalists with proper training and sufficient knowledge should also be given the chance.

The translocation programme should not be abandoned, and it could also be carried out in Assam. The utmost care should be taken during the tranquilisation and transportation of the animals. While tranquilising a pregnant rhino destined for Dudhwa last March 1984, one fully developed foetus was miscarried. Such incidents should be avoided at any cost.

A few rhinos might also be introduced into Jaldapara and Gorumara Sanctuaries to prevent further inbreeding.

RESEARCH ON PHEROMONES OF TIGERS AND LEOPARDS

by R.L. Brahmachary

The Department of Environment, Government of India, has entrusted a research scheme on pheromones of tigers and leopards to Prof. R.L. Brahmachary of the Indian Statistical Institute, Calcutta, and Prof. J. Dutta of Bose Institute, Calcutta. (See *Tigerpaper* Vol. XI: No. 3, 3rd Quarter 1984, p. 18–23, "Pheromones of Leopards: Facts and Theory.")

A survey should be sponsored to locate all pockets where the Indian rhino presently occurs.

References

- Anon. 1978. The fate of wildlife in Bangladesh. *The Bangladesh Illustrated Weekly*. Jan. 29 1 (44): 8–10.
- Choudhury, Anwar uddin. 1984. Rhino in Nagarbera. *The Sentinel*. Feb. 6. Gauhati.
1982. Wildlife preservation in north-eastern India. *Magazine of the Students' Geographical Forum*. Gauhati University II: 37–44.
- Clutton-Brock, J. 1965. Excavations at Langhnaj: 1944–63. Part II: The Fauna. Pune, Deccan College.
- Gee, E.P. 1964. The wildlife of India. Collins, London.
- Momin, K.N., Shah, D.R., and G.M. Oza. 1973. Great Indian rhinoceros inhabited Gujarat. *Current Science*, 42: 801–802, figs. 1–3.
- Prater, S.H. 1948. The book of Indian animals. Bombay Nat. Hist. Soc., Bombay.
- Rookmaaker, L.C. 1980. The distribution of the rhinoceros in Eastern India, Bangladesh, China and the Indo-Chinese region. *Zool. Anz.*, 205: 253–268, figs. 1–2.
1983. The former distribution of the Indian rhino in India and Pakistan. *J. Bombay Nat. Hist. Soc.* 80: 555–563.
- Singh, Samar. 1984. A flight of rhinos. *Sanctuary Asia Magazine*. Vol. IV (3), 250–260. Bombay.
- Yin, Tun. 1967. The wild animals of Burma. Rangoon.
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Because of a failure to come to an agreement with the Calcutta Zoo and the West Bengal Forest Department, it has not been possible to commence this project in Calcutta at all. Therefore, this research, entailing the rearing of tiger cubs outside cages is now envisaged to be executed somewhere else in India. The purpose is to identify the remaining pheromone molecules and the urinary non-volatiles which are transferred by the tongue to the vomeronasal organ and thereby transmit messages to the brain. X-ray cinematography may also be used in this connection.