BY THE SAME AUTHOR

Wildlife

The Twilight of India's Wild Life

Children

The Tiger's Tailor

Poetry

The Twig is Bent

INDIA'S WILDLIFE and WILDLIFE RESERVES

B. Seshadri

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B. Seshadri

Contents

vengeance on all members of the same species as its original tormentor—and once things have gone to this stage, there is no alternative but to shoot it.

Elephants ranged far and wide where there was good forest cover in hilly country and a large supply of bamboo and water. Where this kind of habitat remains, they survive, with the higher level of protection offered today. The visitor may hope to see them in any one of the following reserves: Corbett, Manas, Kaziranga, Palamau, Bandipur, Mudumalai, Anaimalai, Anaimudi, and Periyar.

THE RHINOCEROS

All three Asiatic rhinoceroses lived in India; but both the smaller onehorned or Javan, and the Asiatic two-horned or Sumatran, have been extinct within Indian limits for a long number of years. Both survive precariously in parts of South-east Asia, with no guarantee that they will eventually come through: the odds against them are too great.

The **Great Indian Onehorned Rhinoceros,** the sole survivor in India, also reached a critical state around the turn of the century, and was saved only just in time. This rhino is a great, massive animal, an adult bull standing over $1\frac{3}{4}$ m. (6 ft.) at the shoulder and weighing around 2,000 kg. (4,400 lb.). It is bigger than the African black rhino and about the size of the white rhino, and with it is the largest land animal after the African and Indian elephants. The single horn is about 40 cm. ($1\frac{1}{3}$ ft.) long, but may be longer. Easily distinguished from its African cousins by the heavy folds which divide its tubercle-studded skin into great shields, its prehistoric appearance sets it apart from the other wildlife of India. It is an animal of grass and swamp jungles, generally solitary, and quite inoffensive.

With a former range which extended from the north-western passes of India eastward along the Gangetic plain to Burma, through Bihar, Bengal and the Sunderbans, today it survives only in a few reserves in Assam, north Bengal, and Nepal. In all, it is thought that about one and a half thousand animals are left.

The annihilation of this great beast, before the era of large-scale destruction of forests and swamplands in the post-war period, was due, equally, to two reasons : indiscriminate hunting and poaching. There are horrific accounts of large numbers being slain in the winter shoots that used to be organised for the exalted and their retinues, both Indian and British, in north Bengal and Nepal. For example, on a day in 1886, five rhino were shot before lunch by a single shooting party in Koch Bihar, the feat noted thus : 'I do not think this record has been beaten.' As the shooting was done from elephant-back, there was no great risk—or skill—involved against an easy-to-see and easygoing adversary. Concern began to be first expressed for its future at the turn of the century. The first steps to legislate for its protection were initiated in Bengal and Assam, where it was closed to sportsmen. However, it was many years later that legal protection was forthcoming: in 1932 the Bengal Rhinoceros Act was passed, and in 1954 the Assam Rhinoceros Bill became law. The bills prohibited the killing, injuring, or capturing of any rhinoceros, and penalised contravention by fine or imprisonment.

But none of this effectively stopped the poaching : this has gone on unabated from the times when the rhino were many to today when they are so few. The poachers' main interest was, of course, the horn, which was endowed with potent medicinal properties in the Far Eastern and South-east Asian pharmaceutical trades. The horn is not true horn but merely an aggregation of hair matted together solidly as to appear and feel horn-like: it has no medicinal value whatever. In the Yemen, the horn has a big market and is prized for dagger handles. Early in this century, a horn sold for £150 in the international market; in the fifties the price had gone as high as £1,000. The animal was killed cruelly by inefficient guns or caught in pits. Other parts of its body were also credited with a host of magical properties, and so virtually the whole carcass was saleable. In more recent years, with the prices being paid for the horn soaring ever higher, and the greater chance of being apprehended by forest guards in the reserves where alone the rhino was now to be found, poachers have tended to cut off

the horn and run. Lest it be thought that rhinoceros superstitions are all of Eastern origin, most of these beliefs were once held in Europe as well; rhinoceros horn cups, for instance, were used by kings and popes to show up poison in their drinks by making them froth or even cracking the cup.

As with the elephant and all other wildlife, rhino were attacked from yet another quarter when their habitats began to be eaten up by irrigation, reclamation, and settlement schemes. Along the Himalayan foothills and in Bihar it ceased to exist : it had long gone from the Sunderbans. In north Bengal it was saved in the nick of time, for a few animals to survive in Jaldapara and a couple of tiny enclaves where it has no long-term future. In Assam it was saved primarily in Kaziranga, and there are some more in Manas and a few other smaller reserves.

The Indian rhino lives, barring accidents, to a good 40 years. Only if harassed or wounded, does it show aggression. For all its bulk and stolidity, it can manoeuvre quickly—unlike an elephant. When it does press home a charge, it does not use its horn to strike, like its African cousins; instead, it applies its tushes, or large incisor teeth, in its upper and lower jaws, especially the latter. The wound thus made is a gash which looks as if it might have been inflicted with the horn. In nature, the rhino's fights are only with its own kind, generally for territory. Its size and power ensures its safety from the tiger, which might however, snatch an unattended calf. Mothers defend their calves bravely. Gee, in *The Wild Life of India*, wrote of a rhino which had been badly wounded by a bungling sportsman and had made off; it was found by the same man the next day fighting off a pair of tigers which had no doubt thought to take advantage of its enfeebled state, and shot by him.

THE WILD OXEN

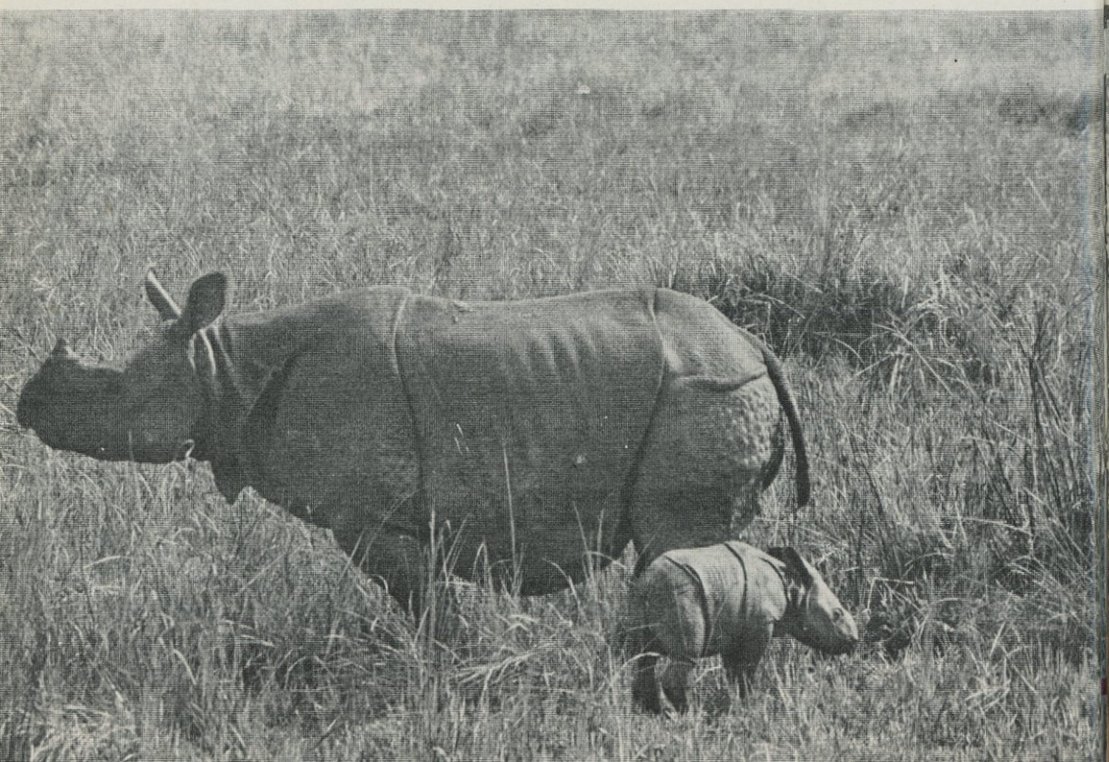
India's two great wild oxen, the **Gaur,** or the so-called Indian Bison—oddly, the genuine bison in North America is more often called the buffalo in that country—, and the **Wild Buffalo,** are also the largest wild oxen in the world.

An adult bull of either animal may welgh 1,000 kg. (2,200 lb.) and stand over $1\frac{3}{4}$ m. (6 ft.) at the shoulder. Opinions differ as to which is the mightier animal. Two sportsmen-naturalists who considered the gaur as the mightiest of wild oxen were C.E.M. Russell, who wrote in his book *Bullet and Shot in Indian Forest, Plain and Hill* (1900), 'The Indian bison..is a magnificent animal, which may well be described as emperor of all the bovinea in the world,' and Fletcher who said in *Sport on the Nilgiris and in Wynaad*, 'Every writer on Indian sport begins his chapter on the bison with the emphatic assertion that "he is the finest specimen of the genus *Bos* in the world," and no one who knows this grand animal will dispute the assertion.' Those who knew the wild buffalo well had no doubt it was the greatest of the oxen. Best recalling his first sight of a herd wrote in *Forest Life in India*, 'Never in the whole of my service did I see such a sight again. I saw, in the Banjar, hundreds of deer—*bara singh*, *sambur* and *chital* grazing together with a small herd of bison on the fringe of the trees, but the sight could not compare with my first view of wild buffaloes in the light of that still early dawn on the silent river.'

Be it as it may—and no one has ever recorded bulls of either species testing their strength against bulls of the other—their hunting was rated on a par with tiger shooting by the sportsmen of old. The pursuit of buffalo was less arduous than the pursuit of gaur as it lived in open country as opposed to the gaur's hill and forest habitat : but it was also the more dangerous because of its greater aggression when thus followed. Its bulk and vitality can be gauged from a fine bull which took sixteen shots from Captain Forsyth and his companion before it succumbed; another knocked down an elephant in a headlong charge. Not to be outdone, Russell has recorded a gaur hunt when a bull took nine bullets before it died. Both animals are peaceable enough, until harassed or wounded, when they could be formidable antagonists.

The gaur has an extraordinarily massive body, the impression of great depth being emphasised by the dorsal ridge which starts in front of the withers and extends with a

Rhinoceros, Kaziranga



Rhinoceros cow and newborn calf, Nepal

Gaur herd, Mudumalai

Bull gaur, Mudumalai

tiger and other animals, reproduced in his two books *With a Camera in Tigerland* and *The Jungle in Sunlight and Shadow*, in these forests.

Other fauna in the reserve include the leopard, leopard cat, sloth and black bear, rhesus macaque, common langur, sambar, chital, barking deer, hog deer, small and common palm civet, common mongoose, hyena, jackal, red fox, common otter, ratel, porcupine, rufoustailed hare, goral, wild boar, marsh crocodile, gharial, and python. Both the monkeys occur in plenty and may be seen almost anywhere. Large chital herds with splendid stags make a fine scene in the winter sunshine on the grassland in the mornings and late afternoons. Hog deer are common, singly or in pairs or small groups. Some wild boar are always rooting on the river bed. Crocodile and gharial may be seen basking on rocks in the river at favoured places: but the least disturbance sends them slithering into the water. Large water tortoises may also bask in the sun. Mahseer, trout, and goonch provide excellent fishing, for which a licence has to be obtained: the best fishing is from March to May.

The reserve is inaccessible in the monsoon months from July to October. Trips into the reserve from camp are made on elephant back, but one can drive around in a car on the dirt roads in the grasslands area, but this is not productive because of the noise and dust raised. Evidence of tiger pug marks—often in profusion—on these and foot tracks each morning is proof of their nightly presence close to Dhikala camp, hunting chital, hog deer, and wild boar. An early morning ride on an elephant gives the best chance of seeing a tiger on its way back to forest cover after a night out on the grass and river bank.

Bird life abounds, and over 600 species have been recorded. It is only possible to mention a few: whitebacked, king, longbilled, scavenger and griffon vulture, blackwinged kite, marsh harrier, Pallas's fish-, crested serpent-, and crested hawk-eagle, longlegged buzzard, shikra, osprey, red junglefowl, peafowl, kalij pheasant, black partridge, common sandpiper, curlew, roseringed and Alexandrine parakeet, eagle-, forest eagle-, and brown fish-owl,

nightjar, chestnutheaded and little green bee-eater, great pied and pied hornbill, hoopoe, roller, bluethroated barbet, goldenbacked woodpecker, crag martin, cliff and common swallow, small and scarlet minivet, redvented, whitecheeked, and black bulbul, rufousbellied niltava, blackbird, robin, brown chiffchaff, streaked, whitecrested, and whitethroated laughing-thrush, spotted babbler, yellow-cheeked tit, jungle myna, Himalayan tree-pie, blackheaded oriole, and black drongo. The influx of water birds has brought the great and little cormorant, shag, darter, large, intermediate, and little egret, night heron, paddybird, whitenecked and blacknecked stork, spotbill, spurwinged lapwing, whitebreasted and common kingfisher, white and large pied wagtail, and river chat.

Best time to visit : December-May.

Altitude : 450-920 m. (1,480-3,020 ft.).

Temperature : December 1-13°C. (30-55°F.), May 23-35°C. (73-95°F.).

Accommodation : Forest rest house, tourist chalets, hutments, and tents at Dhikala. Forest rest houses at Kanda, Sarapduli, Gairal, Sultan, Jhirna, Malani, and Bijrani.

How to get there : Nearest airport Phoolbagh 130 km. (81 miles). Nearest railhead Ramnagar 51 km. (32 miles).

Write to : The Field Director Project Tiger, Corbett Tiger Reserve, Ramnagar, Nainital District, Uttar Pradesh.

DUDHWA NATIONAL PARK

The saga behind the establishment of this park is told in Arjan Singh's book *Tiger Haven* (1973). He was the architect behind its emergence.

When he settled into his remote Tiger Haven farm in Kheri district in Uttar Pradesh adjoining the border with Nepal, the forest surrounding it was one of the numerous shooting blocks in the State. Deeply concerned with the decline of forest and wildlife everywhere in Kheri, famous in the past for both, he was determined to give what protection he could to the wildlife in the block. Each year he and his friends, sometimes in fictitious names to add to the number, applied for shooting permits in the block to check the inroads

being made by others, especially the shikar companies which brought oversea sportsmen for big game shooting in India: he and his friends did not shoot and thus used up part of the shooting season. His attention focused on the northern race of swamp deer. This was the situation as he saw it: 'With the possible exception of the black buck, no other species of Indian wildlife had been subjected to such a catastrophic reduction in numbers in the postwar years. The swamp deer is found nowhere in the world but India and Nepal and at one time existed in great numbers all over the north and central parts of the country. In my own region the banks and reaches of the river Sarda afforded an ideal natural reserve for the species up to the end of the second world war. Between the river and the forest, fifteen miles to the north there was plenty of marshland, interspersed with creeks and patches of sand and silt where the unstable Sarda overflowed its banks each year. This was the selected home of the deer, shared by robber gangs and malarial mosquitoes, and it was probably one of the most spectacular wildlife sights in the world to see a herd of nearly a thousand animals galloping across a freshly-burnt plain or splashing through an expanse of water in what seemed like an endless surge of antlers, magnified by the stags' habit of segregating and by the many tines the swamp deer head possesses.

'During this period there were a great many elaborately organised local shoots.. The shoots took place in the jheel, or marshy lake of Mirchia, once famous as the home of countless thousands of swamp deer and now desolate of wildlife except for the occasional migrant flock of mallard which might fly in, only to rise again to the boom of musket, sometimes leaving behind a few of their number. A line of twenty elephants or more used to drive the swamp deer past butts strategically situated on higher land, and the massacre would begin. As many as fifty head a day were reported to have been gunned down in these orgies and only the antlers removed..

'After the war, it was still possible to see herds of over five hundred deer in the region, but with the systematic clearing of the land, their numbers were quickly and

drastically reduced, until only a few groups survived in open grassland areas within the forest. Much the same thing was happening in the rest of India, so that by the early 1960s, one of the last refuges of any size in the whole of the sub-continent was at Ghola, an area of about three thousand acres, eight miles to the west of Tiger Haven.'

This land was leased to landless labour, and in 1964 Arjan Singh began his one-man fight to save the swamp deer, to persuade the Uttar Pradesh Government to acquire the land and turn it into a reserve. The following year, only about 600 deer were left. Despite government acquiesance in 1967, the land was grabbed by political agitators and put to the gun and the plough. He then devised a scheme by which he drove the remaining deer into a small area of reserve forest bordering his farm—only to find that his surveillance was not enough to check the poachers. Eventual triumph came in the next year when the government agreed to declare an area of some 207 sq. km. (80 sq. miles) surrounding Tiger Haven into a wildlife sanctuary. This was the genesis of the park—it was made a national park in 1977—, which today extends over 500 sq. km. (193 sq. miles) and right up to the border with Nepal.

Swamp deer reduced to about 250 head at the time of Arjan Singh's drive have now increased to over a thousand. A further number is reported to be living in the Sukla Phanta sanctuary in Nepal, and a few more on the Nepalese side of the border to Dudhwa.

Wild elephants were never present in the Dudhwa area as it was not part of their range in this region. But there are some elephants in the park today following large scale clearing of forests on the Nepal side for human settlement. The sal forests of Dudhwa do not provide suitable habitat for the elephant: the animals are known to be restless, and constantly on the move for forage. There is an occasional tiger and leopard: this was not always the case, but leopard poaching for its skin has virtually denuded the area of this animal. There are some sloth bear, nilgai, sambar, chital, and hog deer.

Arjan Singh's celebrated work with tiger and leopard is simply, but enthrallingly, told in his three books *Tiger Haven*,

Prince of Cats (1982), and *Tiger*! *Tiger*! (1984).

Best time of year to visit : December-May.

Altitude : 100-200 m. (330-660 ft.).

Temperature : December 9-23°C. (48-73°F.), May 25-40°C. (77-104°F.).

Accommodation : Forest rest house at Dudhwa.

How to get there : Nearest airport Amausi 250 km. (155 miles). Nearest railhead Dudhwa 4 km. (2½ miles).

Write to : The Wildlife Warden, Kheri Region, Lakhimpur Kheri, Uttar Pradesh.

JALDAPARA SANCTUARY

By the early 1930s the great onehorned rhinoceros was on the verge of extinction in what is now the State of West Bengal. In the northern part of the State, it was once sufficiently numerous to be saddled with a major responsibility for the destruction of rice, maize, and millet fields—with little justification, however, for it is not a crop-destroyer, although occasionally it may enter cultivated fields for titbits. The government even offered a reward for its destruction. As the rhino was plentiful, it was slaughtered in shoots: there seem to have been an excess of over-keen sportsmen who never knew when they had had enough. Poaching, too, was rampant, the killers seeking the money-loaded horn.

The Bengal Rhinoceros Act of 1932 prohibited all rhino killing and gave the beleaguered animal legal protection. This however did not prevent loss of its habitat as the population of the State soared and land and ever more land was wanted for human settlement; nor indeed did it stop the poachers. It was mainly due to the efforts of E.O. Shebbeare, who was then the head of the Bengal Forest Service, that Jaldapara was proclaimed a wildlife sanctuary in 1941, primarily for the protection of the rhino which was now on its last legs in Bengal.

The sanctuary, below the eastern foothills of the Himalayas, is of 115 sq. km. (44 sq. miles) and shaped like, with a little imagination, a pair of trousers, with a waist about 4 km. (2½ miles) wide and each leg about 18 km. (11 miles) long. It is mostly riverain forest, tall and deciduous, interspersed

with dense high grass and crisscrossed with water courses. The Torsa, Malangi, and other mountain rivers pour through it on their way from the Himalayas to the plains, frequently changing their courses in flood times. These changes result in the formation of numerous pools and marshes, and provide ideal habitat for rhino and wild buffalo; unfortunately, the latter is no longer present, having been eliminated many years ago. Most of the sanctuary is flooded each year from melting snow, and sometimes the effects have been devastating. Forest blocks have been washed away and great quantities of silt deposited with damaging consequences on the vegetation; and wildlife has been lost. But left to its own devices, nature recovers in a few years. Jaldapara is a very scenic sanctuary, with the lofty snow ranges of the Himalayas in the background.

Bengal was formerly very rich in wildlife, but outside of a few reserves today, all wildlife habitats have been lost through advancing human activities—water and power schemes, tea plantations, industrial projects, and refugee resettlement. Of the reserves in the north, Jaldapara is the most important—leaving aside the new Buxa Tiger Reserve. Besides rhino, it holds an occasional tiger or leopard, elephant, gaur, sloth and black bear, rhesus macaque, sambar, swamp deer, chital, barking deer, hog deer, large civet, jackal, wild dog, common and clawless otter, porcupine, rufoustailed hare, wild boar, and python. The rhino population is around 50. Elephant and gaur move into and out of the sanctuary, the former using the adjoining forests in Bhutan. Gaur do not exceed some 20 head at any one time. Sambar, swamp deer, and chital numbers are small, but barking deer and hog deer and more common. Wild boar is relatively common. Troops of rhesus macaque may be seen.

Bird life is rich: some residents are the blacknecked and lesser adjutant stork, red junglefowl, peafowl, black and grey partridge, Bengal florican, great sand and lesser sand plover, and redflanked bush-robin; there are a great many more.

Some of the most entertaining description of rhino in this territory was given by Shebbeare in his book *Soondar Mooni* (1958): 'Seen for the first time a rhino seems to

strike people as "prehistoric"—perhaps the shields of his armour remind them of Triceratops or some such gigantic lizard of the past. In back view, seen from an elephant, the great shields over his rump seem to overhang the rather short hind legs like the carapace of a tortoise. Altogether he is remarkable rather than beautiful, and the tunnels which he drives for miles on end through straw-coloured seas of giant grasses are as curious as himself. Worn smooth, one is tempted to say polished, by the frequent passage of his body, which neatly fits the bore, they suggest to a countryman a rabbit-run enormously magnified or, to a Londoner, the Underground Railway.

'Just as elephants first align all main arterial routes which traverse forest, foothills and even dry savannah, so the rhino, in his own domain of wet savannah, lays out the system of communications used by the lesser animals. These "lesser" animals include man, wherever he has not cut paths for himself. It is reasonably safe to walk, or even ride, along a rhino-path provided one avoids the owner's "rush-hours"—he is sure to be dozing in one of his wallows during the heat of the day. Certainly nobody wants to meet him face-to-face. A deer or tiger can avoid this by slipping through the grass wall of his tunnel. For such a clumsy creature as man or, worse still, a man on horseback—a head-on collision would be much like meeting a tubetrain in similar circumstances. It is not that a rhino is truculent by nature, but his instinct is to brush opposition aside—and anyone who survives such a brushing can claim to bear a charmed life.'

The sanctuary has had many problems inimical to conservation to contend with since it was constituted. Much of it adjoins cultivated land inhabited by high densities of rural and tribal people. Illegal overgrazing by domestic livestock is commonplace: it denudes vegetative cover and increases risk of damage by floods. The forest's natural resources are used by the people to meet their needs for firewood and construction materials, both of which are now unobtainable around the sanctuary. Poaching of rhino has been an ever-present hazard: the animals are just as often caught in pits as shot. Loss is recurrent, with the escalating prices being paid for the horns. Surveillance is

difficult because of the ease of entry into the sanctuary and the difficult terrain.

The south-west monsoon brings heavy rain to this region from June to September, when the sanctuary cannot be visited. Trips inside are made on elephant back.

Best time to visit : December-April.

Altitude : 50-70 m. (160-230 ft.).

Temperature : December 12-21°C. (54-70°F.), April 23-27°C. (73-81°F.).

Accommodation : Madarihat tourist lodge. Hollong forest bungalow. Borodbari forest bungalow and youth hostel.

How to get there : Nearest airport Hasimara 5 km. (3 miles). Nearest railheads Madarihat 1 km. (½ mile), Hasimara 5 km. (3 miles).

Write to : The Tourist Bureau, Government of West Bengal, 3/2 B.B.D. Bag, Calcutta, West Bengal, or The Divisional Forest Officer, Koch Bihar, West Bengal.

MANAS TIGER RESERVE

To the east of Jaldapara flows the river Manas, which like the Torsa, debouches from the Eastern Himalayas in Bhutan to the plains below. The scenery on both sides of the river is outstanding and the wildlife varied.

The Manas reserve is vast, over 2,840 sq. km. (1,096 sq. miles), with a core area of 391 sq. km. (151 sq. miles), spread across the river and its associate streams, the Beki and Hakua. It consists of moist deciduous and evergreen forests, riverain jungles of *shisham* and *khair*, grassland, and stone- and shingle-covered river beds. In the drier areas are forests of sal. The river courses twist and change in flood times, and riverain islands appear and disappear. The northern boundary of the reserve is the Indo-Bhutan border : on the Bhutan side, the hills are thickly forested. There is free movement of wildlife across the border.

As a tiger reserve, Manas receives special attention for the preservation of the entire biotope. Human exploitation of the core area is prohibited, but the buffer forests are worked on a selection system; grazing is permitted but under

control. There is considerable pressure from the tribal people who have freely used these forests in the past and denuded them of wildlife. The forests in the southern parts of Bhutan were virtually free of human exploitation, and provided a refuge for the tiger, which here lives to altitudes of 3,000 m. (9,800 ft.). The Bhutan Government established its own Manas reserve of 565 sq. km. (218 sq. miles) adjoining the Indian reserve, making a contiguous wildlife habitat, and an agreement was reached between the Indian and Bhutan Governments for joint management, which is now in operation.

Manas is noted for its wild buffalo, which seems to attain its biggest development here. Gee wrote in *The Wild Life of India*, 'Wild buffaloes are the animals for which Manas is justly famous. These animals grow bigger and carry larger horns than the wild buffalo of other parts of India. The cows have longer horns, the bulls thicker ones.' These buffalo are genuinely wild, without the admixture from feral or domestic herds which is sometimes the case in other parts of Assam and the Deccan. The buffalo gather on the wide sandy and shingly beaches of the Manas and Beki rivers and their numerous grass-grown channels, and may be approached on elephant back without causing alarm.

There are not many rhino here; there used to be, but surveillance was very difficult in this remote tract, and poachers were virtually free to do as they pleased. Wild elephants may be seen, but as they move freely in and out of the reserve, they do not stay in one place. The Manas elephants are among the biggest in India, with some very large tuskers. There are a few gaur. Tiger and leopard are not easy to see, owing to the vastness of the reserve.

Other fauna include the rare clouded leopard, black bear, sambar, swamp deer, barking deer, hog deer, capped and golden langur, slow loris, common and clawless otter, hispid hare, wild boar, pigmy hog, and gharial in the rivers.

The golden langur was first documented in this tract by Gee in 1953, although there were rumours of its existence before. This is how Gee described his discovery in *The Wild Life of India* : 'For a number of years there had been reports of a cream-coloured langur on the east bank

of the Sankosh river, near Jamduar which is close to the India-Bhutan border. The first news of the existence of the animal came from E.O. Shebbeare in 1907, but no photographic record and no live or dead specimens were obtained for examination.

'In 1947 a sportsman called C. G. Baron, who was also a bit of a naturalist and photographer, saw these langurs, and wrote in the visitors' book of the Rest House, "I saw snow white monkeys (langurs)..and so far as I know they are an unidentified species. The whole body and tail is one colour—a light silvery-gold, somewhat like the hair of a blonde." The following year another sportsman wrote in the visitors' book that he "saw Sankosh cream langurs."

'From time to time in the late forties and early fifties I had been told about the existence of these cream-coloured langurs near the Sankosh river. So I decided to visit Jamduar and find out if these monkeys were a new species or not.

'Accordingly, I went to Jamduar in November 1953, and was delighted to find two troupes of these golden langurs on the east side of the river, close to Bhutan. They were pale chestnut in colour, as it was then winter. I found out later that the colour varies at different seasons of the year: the golden or light chestnut colour of the cold weather pales into creamy-white with the advent of the hot weather in March.

'I photographed these exquisitely beautiful langurs both with still and cine camera..'

Later, in 1959, Gee found the golden langur on the banks of the Manas river, to the east of the Sankosh.

Manas is now the single most important area for the future conservation of both the hispid hare and the pigmy hog. There is about 40 sq. km. (15 sq. miles) of thatchland, ideal habitat for both, in the reserve, and their future will depend on reduced burning of the grassland which is carried out to protect accidental fires and improve the fodder.

Bird life in Manas is extremely varied. River birds include the great and little cormorant, shag, spotbilled pelican, little egret, night heron, paddybird, white and black ibis, common shelduck—not usually seen elsewhere in India—, goosander, river chat, and many others. A great

attraction among the birds is the splendid great pied hornbill: it may be seen flying in parties, the loud droning sound of the wings in flight or the loud and deep note of its cackle the first indication they are overhead. They seldom come to ground. The pied hornbill may also be seen.

Mahseer and *bokar* fishing is permitted in the Manas and Beki rivers from November to March.

The usual method of viewing wildlife is on riding elephant; but trips on the rivers by boat—very worth-while—can be arranged.

Best time of year : November-March.

Altitude : 100-120 m. (330-390 ft.).

Temperature : November 12-19°C. (54-66°F.), March 15-30°C. (59-86°F.).

Accommodation : Manas tourist lodge. Mothanguri forest bungalow.

How to get there : Nearest airport Gauhati 176 km. (110 miles). Nearest railhead Barpeta Road 40 km. (25 miles).

Write to : The Field Director, Project Tiger, Manas Tiger Reserve, Barpeta Road, Assam.

KAZIRANGA NATIONAL PARK

Almost enclosed by mountains and crossed by the broad, fertile valley of the great Brahmaputra river, Assam has a monsoon climate characterised by heavy rainfall, and was once clothed in unbroken stretches of tropical forest. With the coming of the tea industry in the 1850s, immense areas were cleared for plantations, and with the plantations came more people who further cleared the thick grass and tree jungles for other uses. Wildlife habitats were lost to settlement, cultivation, and grazing. The great onehorned rhinoceros, which we met at Jaldapara, shrunk rapidly in its range; today, it has its most important refuge in Kaziranga.

Kaziranga was a favourite shooting ground for sportsmen and a paradise for poachers, who were of course chasing the rhino's horn. Following fears in the early years of this century that it was being rapidly killed off, Kaziranga was

closed to shooting and declared a forest reserve, with 230 sq. km. (89 sq. miles) area. In 1926 it was declared a sanctuary. But poaching was endemic, and difficult to check. Gee wrote in *The Wild Life of India* 'In the early 1930s Kaziranga was a closed book, a sort of *terra incognita* completely left to itself by the Forest Department. I remember trying to get permission to go there in 1934, but the rather lame excuse of the British D.F.O. was, "No one can enter the place. It is all swamps and leeches and even elephants cannot go there." Shortly afterwards the very fine Chief Conservator, A.J.W. Milroy, thought otherwise, and decided to clean up the poaching which had recently started again and to open up the sanctuary for visitors.

'I have talked to the Forest Officer who was the first to be deputed to survey Kaziranga in the mid 1930s. He found poachers' camps at every *bheel* (small lake), and about forty carcasses of rhino with the horns removed. The Mikirs, the simple, peaceful but very interesting tribal folk who dwell in the Mikir Hills just on the southern boundary of the sanctuary, were among the many poachers.'

Kaziranga was opened to visitors in 1938. But it was not until 1954 that the rhino was given legal protection in all Assam by the Assam Rhinoceros Bill which prohibited the killing or capture of rhino and prescribed penalties.

The park is of rough oval shape, approximately 40 km. (25 miles) long and 13 km. (8 miles) wide at its broadest point, and of 430 sq. km. (166 sq. miles) area. It lies on the south bank of the Brahmaputra, and its south side boundary follows for the most part the Mora Diphlu river which is close and parallel to national highway no. 37, the main arterial highway in Assam. Two other rivers, Diphlu and Bhengra, flow through it, and a number of small streams originating in the Mikir Hills drain into these rivers or the *bheels*. The whole area is one of vast swamps interspersed with great expanses of high, coarse grasses, often collectively called 'elephant grass', 5 m. (16 ft.) or more high, open forest, watercourses, *bheels*, and reed beds. A feature of many of the *bheels* is the excessive growth of the water hyacinth, a plant exotic to the park but introduced into it in some unknown manner. South of the highway are the

Mikir Hills rising to 1,220 m. (4,000 ft.) which have a special significance to the park, as the wildlife seek refuge on the hills when virtually the whole park becomes inundated by the flood waters of the Brahmaputra and the other rivers during the monsoon. Much wildlife is lost at this time.

Kaziranga, like the Hluhluwe Reserve in South Africa, has always had its rhino personalities. The most famous of these was Burra Gaenda, or Big Rhino, long dead. It was an enormous animal, battlescarred, but in its later years of placid temperament and could be approached by visitors on foot. The riding elephants had developed a rapport with it, and the big rhino would often come seeking them and stand quietly in their midst to the delight of visitors. Newly arrived tame elephants were introduced to their work by being taken to meet Burra Gaenda. The mahouts used to tell a story, apocryphal no doubt, of how a brave army officer hand-fed it with grass and then slapped it on its rump. After its death, other rhinos stepped into the limelight, all locally famous. The present rhino population of the park is about 400. Average annual mortality is around 30, from natural causes, poaching, and predation of young by tiger.

Gee once had a narrow escape from a rhino here. His riding elephant did not turn up one morning, and he decided to walk to the tree where he had set up a *machan* to photograph a pair of Pallas's eagles which were nesting in a silk cotton tree nearby. So he left with two retainers. They had not gone a hundred yards when a rhino appeared. The men fled, and Gee too made a move. However, he soon 'slipped and fell down, flat on my face, with the rhino very close at hand. I knew that an Indian rhino, unlike a wild elephant, will not continue its attack on a fallen victim, and I quickly rolled sideways off the track into the grass and remained perfectly still.' The rhino went past, and he was safe.

The second main attraction in the park are the wild buffalo. There are about 500, and they may be seen in small herds, but big, lone bulls may also be around. These bulls have been known to enter herds of domestic buffaloes grazing on the fringes of the park and service the cows.

In addition, there are feral buffaloes around the limits of the park, which are markedly more tolerant of human presence; the danger of all this is possible degradation of the wild herds by admixture.

Elephants are not resident all the year round, migrating to the Mikir Hills during the monsoon, but this is much reduced by the destruction of their routes by the tribal people. Gaur also used to be non-residents, coming down from the same hills for pasture, but as the gap between the hills and the park widened, some have taken up residence in the park. Other park animals are the tiger, leopard, leopard cat, sloth, black, and Malayan sun bear, hoolock, rhesus macaque, common and capped langur, sambar, swamp deer, barking deer, hog deer, common and clawless otter, wild boar, and python. The black and sun bears—the latter if it still occurs here—are rarely seen. Swamp deer may be seen in small herds around the bheels, and constitute the largest population in eastern India. Hog deer are in plenty.

As may be expected, there is a great variety of birds. Water birds resident and migrant, include the great and little cormorant, shag, darter, spotbilled pelican, little egret, night heron, paddybird, openbill, whitenecked, blacknecked and lesser adjutant stork, spoonbill, barheaded goose, cotton and common teal, mallard, gadwall, wigeon, shoveler, pochard, redcrested pochard, tufted and Brahminy duck, Pallas's fish-eagle, common and demoiselle crane, and Bengal florican. Among the other birds, the red junglefowl, grey partridge, kalij pheasant, pied hornbill and green pigeon may be seen.

The park is now virtually free of human intrusion, except for an occasional case of rhino poaching. The years from 1967 to 1969 were among the worst for rhino losses from poaching : this, hopefully, is a thing of the past.

Kaziranga is unique among the Indian reserves in that no visitor fails to see its most important residents, rhino and wild buffalo, even if he makes but a single trip into it : he will probably see many other animals too. Visits are made by minibus or jeep and riding elephants : most start at

Mihimukh, 3 km. (2 miles) from the main tourist camp along a motorable road.

Best time of year to visit : November-April.

Altitude : 75-85 m. (250-280 ft.).

Temperature : November 12-30°C. (54-86-°F.), April 18-32°C. (64-90°F.).

Accommodation : Kaziranga forest lodge and tourist bungalows. Baguri, Arimarah and Kohora forest inspection bungalows.

How to get there : Nearest airport Jorhat 84 km. (52 miles). Nearest railhead Jakhalabandha 43 km. (27 miles), more convenient Furketing 72 km. (45 miles).

Write to : The Tourist Information Officer, Kaziranga National Park, Kaziranga, District Sibsagar, Assam, or The Divisional Forest Officer, Eastern Assam Wildlife Division, Bokakhat, District Sibsagar, Assam.

KEIBUL LAMJAO NATIONAL PARK

A famous place in the old days for waterfowl shooting was the Logtak lake in the former Princely State of Manipur, some 32 km. (20 miles) south of Imphal, the capital—and Allied base in the Burma campaign in the last war. In the surrounds of the lake, which is of about 65 sq. km. (25 sq. miles), were several marshy areas, which were the habitat of the Manipur race of browantlered deer—or *sangai* as it is locally known or *thamin* in Burma—, so-called because the brow tines of its antlers sweep forward and the beams backward in a continuous graceful curve. There is a Burmese and a Thai race of this deer, but of their current status, little is known. All but one of the marsh areas were reclaimed and cultivated; the one swamp that was left was Keibul Lamjao at the south-eastern corner of the lake where the deer made their home, protected by the rulers of Manipur. In the war and postwar years, the deer were persecuted by the troops—and the local people joined in—and were rapidly shot out : so much so that by 1951 it was thought they were extinct. However, a few survivors were subsequently found, and an area of 52 sq. km. (20 sq. miles) was made into a sanctuary in 1954. This was reduced to

28 sq. km. (11 sq. miles) in 1959; but 8 sq. km. (3 sq. miles) were restored in 1968, making the present park area of 36 sq. km. (14 sq. miles). A national park was declared in 1977 and all human intrusion forbidden.

Keibul Lamjao consists of a vast, thick mat of humus, called *phumdi* locally, and dead vegetation which floats on water, about one-fifth of it above and the rest below the surface. The mat varies in thickness from 1⅛-1 m. (1-5 ft.): during the dry months of February and March some of it near the edges of the marsh rests on the hard ground below. With the onset of monsoon, the water level rises, and the *phumdi* frees itself and floats again. It is possible to walk on it, and it feels like walking on an air cushion, it moves and shakes, and where it is only a foot or less thick, one is liable to disappear into the ooze beneath. On it grow reeds and grasses, some to a height of 4 m. (13 ft.) or more, and these are food for the deer; the preferred grass being one called *Saccharum latifolium*, which is therefore essential for the conservation of the deer. There are three hills within the *phumdi*—Chingjao, Pabot, and Toya—, and these make good observation points, and a channel has been cut through the mat to Pabot hill which commands a good view. The deer use these hills in high water—they are not exclusively marsh animals and also lived on hard ground in past years. However, they are specially adapted to marshy terrain, and move about on the humus with ease.

Keibul Lamjao is unique. Gee wrote in *The Wild Life of India*, 'There are floating islands on lakes in Kashmir, Burma and North America that I have heard of, but I think that Keibul Lamjao in Manipur in north-east India is the only floating wildlife sanctuary in the world.' He called the deer, 'the dancing deer', after seeing some which were moving around in such a way that there was no other description for it.

Degradation of habitat was not automatically checked by national park status. Illegal encroachments for hit-and-run cultivations, grazing by domestic livestock, and, of course, poaching, continued to bedevil the deer. Another development, the effect of which could not be forecast, was