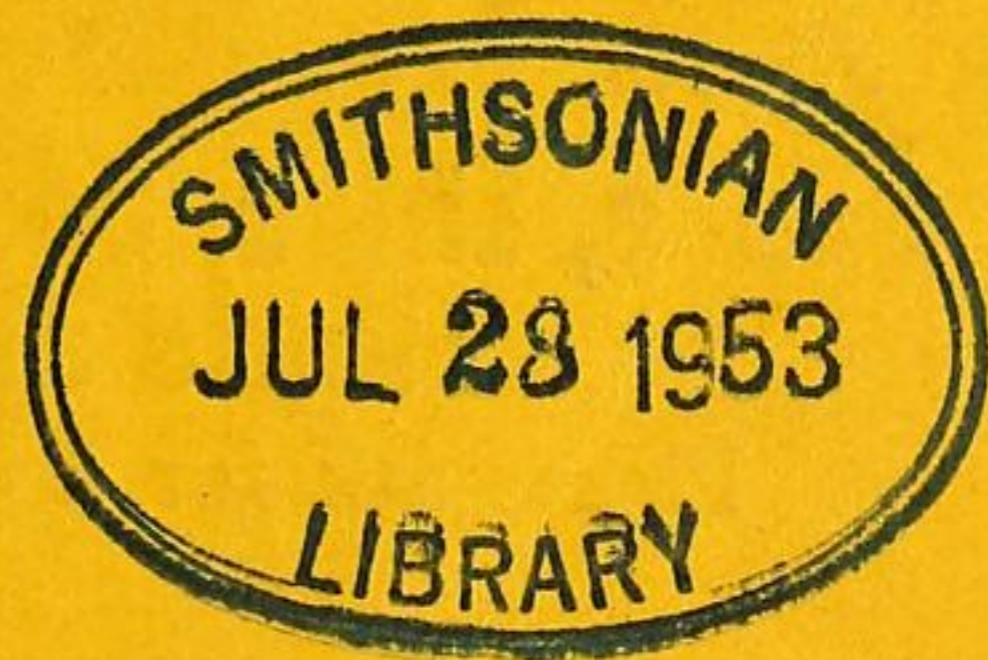


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THE LIFE HISTORY OF THE GREAT INDIAN ONE-HORNED RHINOCEROS (*R. UNICORNIS* LINN.)

BY

E. P. GEE, M.A., C.M.Z.S.

(With a plate)

INTRODUCTION

Very little is known of the life history of the three species of Asiatic rhinoceroses. Owing to the extreme rarity of *R. sumatrensis* and *R. sondaicus*, it will now be difficult to obtain many data about these two species; but in the case of *R. unicornis*, which is preserved in fairly safe numbers in Nepal and in the States of Assam and Bengal of the Indian Republic, it should not be impossible to collect adequate information provided that intelligent and accurate observation is conducted by all concerned.

In addition to the 350 rhino (all rhino referred to in this paper are *R. unicornis*, unless specified to the contrary) still believed to exist in their wild state in Nepal (50), Bihar (2), Bengal (58) and Assam (240), several zoological gardens now contain pairs of these valuable animals. Calcutta has had a pair since 1933, Chicago a pair since 1948, Cairo a pair since 1949 and in 1952 females have been sent to Whipsnade (Britain) and Basle (Switzerland) to complete pairs in these two places. It is now therefore possible to make observations of five pairs of this species of rhino in captivity, though it is admitted that the considerable changes in climate, food and environment may in some cases prove to be a deterrent against breeding.

MATING

The present pair in the Alipore Zoological Gardens, Calcutta, have not successfully mated. It is the opinion of the Superintendent, who has been observing them for the last seven years, that they 'were never observed to come in heat simultaneously, i.e. the female comes to heat when the male is not in rut and vice versa'. This view seems to be shared by Dr. Dillon Ripley of the U.S.A., who believes that the male rhino undergoes a period of sexual excitement as well as the

female, and that the periods must be coincidental before mating can be attempted or accomplished. No such period, however, has been observed in the male at the Chicago Zoological Park; and the Assistant Director there informs me that a 'heat' period has only once been detected in the female—on September 9, 1949—which lasted mildly for three days. The male and female at this zoo have to be kept separate, for on the three occasions on which they have been put together there has been a fight.

If the Chicago Zoo authorities had hardened their hearts and persevered with the matter, their two rhino might have become reconciled to each other, as in the recent case of the pair at the Basle Zoo. P. Ryhiner has informed me that at Basle the newly arrived female was introduced to the male in an adjacent enclosure during the summer of 1952, the male showing some interest. The next stage was to let them come together in the same enclosure, whereupon the female rushed at the male, attacked it and drew blood. The introduction of the female to the male in the same enclosure was then repeated daily, with a daily lessening of the female's aggressive spirit until eventually this perseverance on the part of the Basle Zoo authorities was rewarded by the female becoming quite indifferent to the male's presence. It is, however, pertinent to observe that the female's antipathy and subsequent indifference to the male may have been partly due in this particular case to a possible pregnancy.

Sir William Gowers has informed me that there is a story recorded in London in 1871 of a male rhino acquired by the London Zoo in 1864 'of enormous size, about 5'3" at shoulder, and 10'6" from tip of nose to root of tail. In August 1870 this male and a female (acquired rather earlier) were in adjoining enclosures separated by iron bar fencing. On August 10 the male made frequent attempts to raise the lower transverse bar by placing his horn under it. Eventually the horn became detached by violent pressure, and rolled off into the yard. The animal appeared much hurt, and roared loudly. There was considerable loss of blood, but the wound healed in a few days. A new horn started to grow, and had reached 1½" next year'. This story may indicate sexual excitement in the male, which may have been also in the female simultaneously. It is a pity there was no attempt by the keepers to let these two rhino meet in the same enclosure.

The previous pair of rhino at Calcutta provides us (Sálim Ali, 1926) with the only known information of the mating and also breeding of this animal. As far as could be ascertained from the keeper, mating commenced on March 17, 1924, and continued to the end of the month. The calf was born on October 9, 1925.

Of the four cases known to me of rhino mating in their wild state, all have occurred between the end of February and the end of April, a period of two months. (The reference by Bengt Berg in his book, 'On the Trail of the Rhino', when he reports seeing a pair together in close company at the end of March in the Jaldapara Sanctuary of Bengal, seems to indicate the 'courting' stage only.)

Three cases have been observed in the Kaziranga Wild Life Sanctuary of Assam, as reported by visitors in the Visitors' Book. On April 17, 1938, is the entry 'A couple of rhino seen in the act of mating', and E. I. Matthews has later amplified to me how he 'suddenly came on them, actually mating. It took them about 20 seconds to



E. P. Gee

Great Indian One-horned Rhinoceros (*Rhinoceros unicornis*)

break off in surprise. I took a photo at about 40 yards, but it came out blurred. The female seemed to be on her knees, but it may have been the swampy ground—I can't remember'. The next entry in the Visitors' Book referring to mating is a bare mention of it having been seen on February 24, 1940; and the third was observed by the Divisional Forest Officer on April 25, 1944, 'Two were in the act of mating.'

On March 7, 1952, occurred what is probably the only case of the complete mating having been seen of these rhino in their wild state. The manager's bungalow of Hathikuli Tea Estate is situated near the southern boundary of the Kaziranga Sanctuary, and in front of the verandah is a clearing of some 40 yards wide and 1000 yards long extending up to the sanctuary itself, cleared each year to provide a good view of wild life. On February 11, 1952, six rhino had been observed in the clearing, of which two staged a fight while the other four continued to graze unconcernedly.

At about 2.45 in the afternoon on March 7, a pair of rhino entered the clearing about 500 yds. from the bungalow verandah; and 3 persons, A. B. Cunningham, T. Brown and Mrs. Brown, were able to watch the whole mating scene. The following is a precis of their account: 'At first they faced each other, and there was some caressing. Then, standing nose to nose, they commenced pushing each other backwards and forwards in turn. This continued for about 15 minutes. Then the actual mating started, and the male remained mounted for 1 hour and 20 minutes, while the female moved slowly about, a few steps at a time. The male was not seen to dismount during this period, and one of us was watching all the time, except for a possible break of not more than three minutes or so. The ground on which this happened was fairly hard and dry. After this, the male dismounted and disappeared into the thick reeds. The female stayed around for another 20 minutes before moving off likewise.'

These four cases of rhino mating in their wild state indicate a mating period of two months lasting from the end of February to the end of April; and this is further borne out by the fact that cow rhino are usually seen with newly born calves in the months of October and November. But this two-month period, although it does happily coincide with the case of mating in the Calcutta Zoo in 1924, cannot yet be regarded as conclusive. For only recently a case was reported in Kaziranga of a dead newly born female baby rhino being found on April 22, 1952. The Range Officer says he suspects that the mother accidentally trampled on the head of the calf when it had just been born. The length of the body (excluding tail) was given as 4 feet, and the height as 2 feet.

It is not known whether the mating seasons of *R. sumatrensis* are similar to those of *R. unicornis*, but it might be worth while mentioning that W. F. H. Ansell reported a case at Kahilu in Burma: 'In July (1933) a forester reported he had seen two rhinoceros mating.' Theodore Hubback also saw a pair of *R. sumatrensis* mating in Malaya, but does not mention the day or month.

BREEDING

In the only known case since 1826 of a rhino calf being born in captivity to captive parents, in Calcutta on October 9, 1925, the period

of gestation was about $18\frac{1}{2}$ months. Unfortunately the birth was 'somewhat premature and the calf survived a few hours only'. Possibly, therefore, the full period of gestation may be presumed to be 19 months. In October 1951 in Kaziranga two very small rhino calves were observed by officers of the Forest Department. L. Rynjah, the Divisional Forest Officer, reported one of these cases as follows: 'On the 12th October, 1951, I saw at the edge of Vasalimara Bheel inside the Sanctuary one cow rhino with two calves. One calf is about the size of "Gadadhar" Rhino . . . about 4 ft. to 4 ft. 6 in., but I marked the horn more minutely and it won't be more than 4 inches or less than 3 inches. The other calf is very small about the size of an average domesticated pig (say the height is about 2 ft. or so).' On November 4, 1951, I myself saw a cow with a baby calf of not more than about 2 ft. in height, and the following week saw another cow in another place with a calf of about 2 ft. 3 in. Again, as recently as November 10, 1952, I saw a cow rhino in Kaziranga Sanctuary with the smallest calf yet seen. It could not have been more than 1 foot 10 or 11 inches in height, or more than a week or so old. If from these cases we can deduce that rhino calves are born in Kaziranga in the month of October, this would make the period of gestation about $18\frac{1}{2}$ to 19 months.

Many years ago a report (Hodgson, 1834) had stated that 'The Rhinoceros goes with young from seventeen to eighteen months', and referred to a rhino calf being born at 'Katmandoo' eight years previously in 1826. But it is not known if this calf was born to a pair in captivity, or to a female captured in a state of pregnancy, or what month it was born in. Hodgson also states that only one is produced at a birth, that the young continues to suck for nearly two years and that the young calf has 'when born and for a month afterwards a pink suffusion over the dark colour proper to the mature hide.'

Sir William Gowers has examined Hodgson's MS. volumes in the library of the Zoological Society of London, and has informed me that there is a drawing of a 'Rhinoceros, 9 years old, male, March 1, 1833. Habitat Saul Forest.' And that there is a further note 'This animal showed first symptoms of puberty in his 10th year, when he went to Calcutta. He was born in the Durbar's menagerie, as elsewhere recorded by me'. It is not quite clear if this animal is the same as that recorded by Hodgson in 1834, as there is some discrepancy about the dates of birth.

The dimensions and weights of the known rhino calves are as follows:—

The Katamandu calf—

Height	...	...	2'
Length (excluding tail?)	...	...	3' 4"
Weight	...	...	—

The Calcutta calf—

Height	...	...	...	1' 11"
Length (excluding tail)	...	...	...	3' 2"
Weight	...	...	...	74 lb.

The Kaziranga calf—

Height	...	...	...	2'
Length (excluding tail)	...	...	...	4'
Weight	...	...	...	—

B. C. Ellison records that a fully developed foetus was taken from a cow rhino shot during the Prince of Wales's shoot in Nepal of which the dimensions were:

Height	...	...	...	—
Length (excluding tail)	...	...	...	3' 4"
Weight	...	...	...	120 lb

RATE OF GROWTH

As far as I know, there are only two recorded instances of the exact size of a rhino at a given age. The rhino which was brought to Europe in 1741 had been captured after its mother had been killed when it was only a month old, and it had been brought up by hand. A 'coin' or medal struck at Nuremburg in 1748 states on the reverse side that 'in the year 1747 when it was eight and a half years old it was 12 shoes long, 12 shoes girth, and 5.7 shoes high.' Presumably shoes were equivalent to feet.

The other instance of the size of a rhino at a given age is that mentioned by Hodgson: 'An individual born at Katmandu eight years since measures now 9 ft. 3 in. in length; 4 ft. 10 in. in height at the shoulders; the utmost girth of his body is 10 ft. 5 in.; the length of the head, 2 ft. 4 in.; of the horn 5 in.; he is evidently far from being adult.' The dimensions given on the back of the drawing in Hodgson's MS. volumes of a Rhinoceros, 9-year old' are: length 7' 4½" (nape to rump); height 5' 2"; length of head 2' 5", of horn 6". These latter records seem much more reliable than the Nuremburg one of 1747.

LIFE SPAN

Hodgson states, with regard to the supposed longevity of the rhino, that 'It is believed that the animal lives for one hundred years; one, taken mature, was kept at Katmandu for thirty-five years without exhibiting any symptoms of approaching decline.' Blanford cites fifty or sixty years, and Sterndale mentions a pair living forty-five years in the Barrackpore Park.

Cedric Dover states that 'Fifteen records of the Great Indian Rhinoceros . . . show an average life of about twenty-nine years, a minimum of fifteen and a quarter years and a maximum of forty-seven years.' All these animals were, it is presumed, kept in captivity.

Specimens kept at the London Zoological Gardens have lived for a long period. One which came in 1834 lived till 1849, while a second, purchased in 1850, died in 1874, and a third lived from 1864 till 1906. The female which was captured at Chittagong in 1868 and lived at the London Zoo till 1900 was a specimen of *R. sumatrensis*.

There are several old animals in the Kaziranga Wild Life Sanctuary, all of them bulls, which appear to have been ousted by younger rivals. They are compelled to remain on the fringe of the sanctuary, and generally graze outside the boundary. If they enter they are liable to be attacked by the others, presumably by the bulls, and they bear scars of frequent combats.

One of these in particular is well known to me. It was an old bull living on the boundary as long ago as 1939, and on April 6 of that year I was able to approach quite close and photograph it. It had an old wound on the hindquarters, and was known as the 'boorra goonda'—the old big bull. On January 8, 1950, this same old 'solitary' bull was seen and photographed in close company with a cow, outside the sanctuary, and they remained together for several days, though no mating was observed. This same bull who was still frequenting the same place in April 1952, appears to have lived a long life. If old age can be so prolonged, this would seem to be an additional proof of the rhino's longevity. It would not be unreasonable, I think, to presume that rhino live at least as long as the Indian elephant, up to 70 years.

INFORMATION WANTED ON THE INDIAN RHINOCEROS

As stated at the outset, our knowledge of the life history of the Indian rhino is very scanty. Many are the gaps which need to be filled in. If only our efforts to induce them to breed in captivity can be crowned with success, a great deal will be learnt. As the African Black Rhinoceros (*R. bicornis*) has on two occasions bred successfully at the Chicago Zoological Park, and both the calves reared to maturity, there seems to be no valid reason why *R. unicornis*, which is more amenable to captivity and which quickly becomes exceptionally tame, should not do likewise. In the case of the Chicago Black Rhinoceros, the breeding pair were together since they were youngsters, and this may provide the solution. If so, then there is a chance that some fruitful result may be later obtained at Whipsnade.

A more systematic method of making and recording accurate observations in India's rhino sanctuaries needs to be formulated. A complete ecological survey of the rhino and other wild life in the sanctuaries of north-east India requires to be made. With these ends in view, I have tabulated the following questionnaire which, if handed to every member of the Forest Department concerned with the patrolling of the sanctuaries in which rhino are found, ought to be of use in extending our knowledge of this rare and interesting creature.

1. The Rhino's Horn.

- (a) It is known that the Indian rhino (*R. unicornis*) often uses its tushes (in its lower jaw) for attacking, fighting and biting. Does it also use its horn? If so, does it use its horn at the first charge only, and then its tushes later? Or when?
- (b) Does it use its horn for 'rooting', i.e. digging up roots, grasses, etc.?
- (c) Does it use its horn for steering its calf when the calf runs in front of the mother, as in the case of the African rhino?

2. Rhino Mating, and Fighting.

- (a) It is known that bull rhino sometimes fight. Does this happen in the breeding season for possession of a cow? If so, in what months does it happen?
- (b) In what month(s) of the year does the actual mating of rhino take place?
- (c) Where, and what time of day does it take place?
- (d) Do females ever fight? Or a male with a female?
- (e) Do fights take place in disputes over 'territory'?

3. Rhino Breeding.

- (a) It is believed that the period of gestation of rhino is $18\frac{1}{2}$ or 19 months. Is this correct?
- (b) How does birth take place, lying down or how?
- (c) What happens to the afterbirth?
- (d) What time of the year are rhino calves born?
- (e) Does the newly born calf have a pinkish colour? If so, for how long?
- (f) Are twins ever born?
- (g) Does the previous calf remain with the mother after a new calf is born? If so, how big was the previous calf (height to shoulder)? And how long does it remain?
- (h) How soon after birth can the baby follow its mother?
- (i) Which goes first along the path, the baby or its mother?
- (j) If ever a newly born calf is found dead, it should be carefully measured giving height at shoulder, length of body from tip of nose to root of tail, length of tail, and weight in pounds.

4. Rhino Dung Heaps.

- (a) It is known that the rhino deposits its dung in heaps. Does each particular rhino have its own heap?
- (b) Or do rhino deposit at any heap that happens to be there, as they happen to pass by?
- (c) Do dung heaps denote rhino 'territory'?

5. Rhino Swimming.

- (a) It is known that the Indian rhino can swim, but does it swim willingly and deliberately?
- (b) Or does it only swim when it is compelled to?

6. Rhino and Birds.

- (a) It is noted in Kaziranga that the Jungle Myna is the myna seen on the backs of rhino looking for ticks, etc., and that egrets are also seen accompanying rhino. Is this confirmed by other observers?
- (b) Which kind of egret is found with rhino?
- (c) Do any other kinds of bird keep company with rhino?

7. Rhino and other Animals.

- (a) It is believed that tiger possibly avoid rhino, and are afraid of them. How do tiger react when they meet rhino, and vice versa?

- (b) Are wild elephants scared of rhino, as are domesticated ones?
- (c) Wild buffalo have occasionally been seen in close company with rhino. Is this confirmed?
- (d) Do deer of different kinds, swamp deer and hog deer, consort with rhino?
- (e) Are wild pig ever found in close company with rhino?
- (f) Do any other wild animals show friendship for or enmity against rhino?

8. Rhino in Olden Times.

- (a) It is recorded that in the olden days rhino were kept by princes and others and used in battle against their enemies. This implies domestication and a great deal of training. Are there any detailed accounts of domestication and training of rhino, and of their use in war, etc.? If so, how was it done, when, where and by whom?
- (b) In these old accounts, is there any information about the life history etc. of rhino, such as is sought about their breeding etc.?

9. Noises made by Rhino.

- (a) Grunts and whistling noises have been recorded, as well as roars when a rhinoceros is trapped or wounded. Is the whistling noise made only in the mating season?
- (b) And by which sex is this whistling noise made?

N.B. All observations made in the field should be strictly accurate, and not based on hearsay without verification, or coloured by imagination. Every report should contain the date, time of day, full name and status of the person(s) who made the observation, and names of any witnesses—especially if the event reported is noteworthy. It is suggested that, with the approval of the Senior Conservator of Forests all reports made by members of the Forest Staff should be sent through the usual channels to their respective D.F.Os., copies to the Bombay Natural History Society and to Mr. E. P. Gee, Doyang T.E., Oating P.O., Assam, who will be only too pleased to compile all information thus received.

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