# Notes on the breeding of Black rhinoceroses *Diceros bicornis* at Kobe Zoo

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Two Black rhinoceroses *Diceros bicornis* have been born at Kobe Zoo. The female has an oestrous cycle of about 28–30 days, according to the rhinos' keeper. Signs of oestrus are decreased appetite, and enlargement and opening of the vulva. Before the rhinos mate they spar together for about 30–40 minutes; copulation lasts for as long as 40 minutes. The first calf was a male, 'Bobby', born on 16 November after a gestation period of approximately 465 days. The second calf, also a male, 'Rock', was born on 2 November 1965 after a gestation period of approximately 462 days. 'Bobby' was measured three times after his birth; at 38 days on 24 December 1963 he weighed 80·5 kg, at 61 days on 16 January 1964 he weighed 118·7 kg, and at 94 days on 18 February he weighed 153·0 kg.

The first oestrus observed after the birth of Bobby occurred seven months later and lasted from 27 June until 1 July 1964; the next oestrus was between 26 and 31 July.

# Breeding the Black rhinoceros *Diceros bicornis* at Mysore Zoo

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The pair of Black rhinoceroses *Diceros bicornis* at Mysore Zoo arrived at the zoo on 17 January 1956 from L. Ruhe, Hanover. The male was about six years old and the female about eight years old. The male was smaller than the female and appeared stunted. He was fed specially nutritious food, together with five multivitamin capsules, 28 g multivitamin syrup and 10 calcium gluconate tablets given daily between 9 March 1962 and 31 May 1962. His general condition improved considerably after this treatment.

The two rhinos are kept in an enclosure divided by a wall. They can move freely between the two enclosures and the dens that are attached to them.

From the time she arrived at the zoo the female regularly came into oestrus. The cycle was from 30–35 days and each oestrus lasted from 24 to 48 hours. During oestrus she was much more excitable, made a whistling noise and frequently urinated. At this time she allowed the male to nuzzle her. However, the male was not sexually aroused by her and they never mated.

As both rhinos were mature, it was decided to administer hormone treatment to the male in the hope of making him sexually potent. On 10 February 1963 a course of Testoviron (testosterone propionate) was started. For six days he was given five Testoviron tablets, powdered and mixed with bananas, three times daily. Sprouting Bengal gram, which contains oestrogenic substances, was also fed, together with the normal feed (boiled rice, oats, wheat bran, carrots, and cabbage). On 23 February the male had a partial erection of the penis: this had never been observed in the past. A second course of treatment was administered for six days from 24 February. Soon afterwards he was seen caressing the female. A third course of treatment was administered from 16 April, and a fourth and last course from 13 August to 17 August.

Meanwhile the female was seen to be in oestrus

on the morning of 16 August. The male responded to her by erecting the penis to its full length of about 75 cm and attempted to copulate with the female. As she was sitting down, the penis could not be inserted fully into the vagina. From then onwards whenever the female was in oestrus and approached the male, he would erect his penis and rub it over her genital area. Once again, on 8 September 1964 when the female was in oestrus, the male tried to copulate with her, but once again she was sitting down and the attempt was unsuccessful. On 26 April 1965 when the female was in oestrus the male copulated with her successfully for the first time. Copulation lasted for about 20 minutes. On 26 May a second successful copulation, also lasting for about 20 minutes, took place. After this the female did not come into oestrus again.

From then onwards both rhinos lived quietly together; the female particularly was much less aggressive and stopped chasing the male and remained aloof from him.

On 23 December 1965 it was noticed that the female's mammae, abdomen and genitalia were swollen and these were taken to be definite signs of pregnancy.

On 25 August 1966 it was noticed that the female had chosen the more secluded of the two dens where she was less disturbed by visitors. She tried to drive the male into the other den and became increasingly restless. She frequently moved to the partition to peep at the male and if he tried to enter her den, she drove him out with shrill, whistling noises. The door between the two dens was therefore closed and the female shut off from the public. She then calmed down.

On 26 August milk was seen oozing from her two mammae. A viscous fluid was also discharged from the vagina. At about 1200 hours she lay down in a corner of the den and birth contractions started. The amniotic membrane was seen at 1345 hours. It burst at 1355 hours and the amniotic fluid was discharged onto the floor. The baby rhino's front legs were now visible. At 1415 hours the baby rhino was born, the mother lying on the floor. The gestation period, from the last day of the last observed oestrus to the day of the birth was 458 days.

The baby was immediately licked by the mother. It was fully developed and active. Its body was hairless, except for the lining of the ears and the end of the tail. There were two white patches on the nose: the growing sites of the horns. The front patch was slightly raised. At 1430 hours the calf started trying to struggle to its feet. It succeeded in standing at 1500 hours. At about 1520 hours the calf started looking for the mammae. At 1530 hours it was able to walk slowly. It suckled for five minutes for the first time at 1635 hours. It suckled again at 1700 hours, at 1720 hours and at 1800 hours. After the second feed it became increasingly active, following its mother.

The placenta, which had been hanging from the vulva, dropped away at 1800 hours.

On 27 August the calf was seen suckling at 1800 hours. From then onwards it suckled about every one or two hours. By 28 August this interval had increased to 2–2½ hours, by 29 August to 3 hours and by 30 August to 3–4 hours.

# Notes on breeding Black rhinoceroses

*Diceros bicornis*

# at Pittsburgh Zoo

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The pair of Black rhinoceroses *Diceros bicornis* at Pittsburgh Zoo were bought from Carl Hagenbeck on 23 May 1954. The male was estimated to be 2½ years old and the female three years old at the time. Three years later in 1957 attempts at mating were observed. Two complete acts of copulation were seen in 1958 but the female did not become pregnant. In 1959 one complete act of copulation