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Population trends in African rhinoceroses

Diceros bicornis and *Ceratotherium simum*

living in zoos and safari parks

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Since the last published reports on the stock of African rhinoceroses in captivity (Klös & Frädrich, 1970, 1971), the number of animals registered in the two respective International Studbooks has increased more than twofold. This makes it a suitable point at which to review the considerable body of new data since accumulated. It is a matter of regret that the co-operation of several zoos and safari parks, especially in Japan, the USSR and to some extent also in the USA, has proved difficult and at times impossible to obtain. As a result there are a number of captive individuals, particularly of the White rhinoceros, that still remain unregistered. Whilst somewhat diminishing the value of the present material, these omissions do not, however, obscure the trend of increase which the following analysis reveals.

BLACK RHINOCEROS *Diceros bicornis*

The stock of 128 (67.59 + 2) Black rhinoceroses kept in zoos and similar institutions in July 1969 has currently (31 January 1977) increased to 173 (76.97). As opposed to the approximately even sex ratio of the earlier count, the present ratio shows a marked shift in favour of ♀♀. Of animals registered up to the end of October 1971, 31 (17.14) have now died, and in those registered since, there have been 36 (19.17) deaths. Forty-seven (25.22) of these deaths occurred in imported, and 20 (11.9) in zoo-born specimens.

The number of zoo-bred rhinos living in captivity has increased from 31 in 1969 to 53 (22.31), a clear preponderance of ♀ births. Whereas in the 1960's the average birth rate per year was only three, since 1969 this annual average has risen to five. Providing that the rate continues at its present high level, one might confidently predict that imports from Africa will decrease even further. At the time of publication of the last complete Studbook in 1969, registered imports totalled 116, as compared to the then total of 31 surviving zoo-bred young. Since then, only 41 individuals have been taken from the wild and in the same period 25 surviving young have been born. The ratio of imports to births has thus fallen from 3·7:1 to the present 1·6:1.

The overall birth total is, however, considerably higher: 73 (33.40) since inception of the Studbook on 20 October 1967. The majority of the 20 (11.9) deaths in these zoo-born animals occurred before they had reached sexual maturity, at an average six years of age in ♂♂ and three

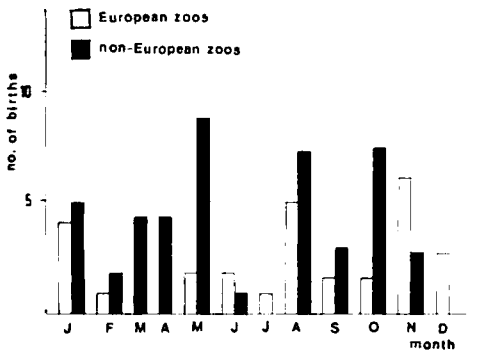

Fig. 1. Monthly distribution of births in the Black rhinoceros *Diceros bicornis*, 1968–1976.

years in ♀♀. It is possible that this is the result of young rhinos being transferred from their birthplace to another zoo when they are about two to three years old and so directly or indirectly falling victim to the stresses of transport.

The average age of living zoo-bred ♀♀ is about 5·9 years, the oldest of them being born in Sydney in 1958. This low average is a consequence of the previous very low birth rate. Only two of these zoo-bred ♀♀ have so far themselves bred: at Dublin no.29 (DUB 2) gave birth to no.142 (DUB 3) and at Oklahoma no. 55 (OKC 2) bore three calves, no.138 (OKC 3), no.192 (OKC 4) and no.208 (OKC 5). In zoo-bred ♂♂ the average age is a little higher, about 7·2 years, as a result of the fact that between 1958–1967 twice as many ♂♂ as ♀♀ had been born. The oldest zoo-bred ♂, no. 24 (CHE 1), was born at Bristol Zoo and has lived at Chester since 1960, where he has fathered three young, no.130 (CHE 3), no.164 (CHE 4) and no.200 (CHE 5). Two other zoo-born ♂♂, no. 54 (OKC 1) at Oklahoma City and no. 110 (WAS 3) at San Diego, have also bred.

Births between 1968–1976 have been almost equally distributed throughout the year, although there is a small seasonal peak between August and November, when 49·3% of all young have been born (Fig. 1). Nearly half of all zoo-bred rhinos have mothers who have produced two or more offspring: four ♀♀ have each had two calves, ten have had three, one has had four and one ♀ has even had five calves. As most of these ♀♀ have lived with the one mate over a long period, it might be concluded that sexual interest does not appear to diminish between pairs of rhinos kept in prolonged proximity in small enclosures. The main problem lies in the time required before the initial mating; once this has been achieved, further breeding activity will take place without much difficulty.

The average interval between births in multiparous ♀♀ is about 36 months. Given a gestation period of about 15 months, it appears that ♀♀ will mate again between 18–24 months after parturition; this accords with the fact that zoo-born young tend to be translocated at two to three years of age.

It is also noteworthy that out of 15 mothers and 45 births – with the exception of two ♀♀ – two young of similar sex are always born in succession.

WHITE RHINOCEROS *Ceratotherium simum* ssp

The explosive growth between 1971–1972 in captive stocks of the southern subspecies *C. simum simum* has decelerated in subsequent years. The International Studbook currently (31 January 1977) registers 351 (162.189) White rhinoceroses of both subspecies, as against only 157 individuals on 1 November 1971, a more than twofold increase in the recorded stock. The rising number of imports of the endangered northern subspecies *C. simum cottoni* from seven (no. 27, WAS 1 died in 1975 at San Diego) to 16 individuals, however, has dangerous implications; numbers are still far to low to permit their removal without risk to the precariously situated wild population.

The death rate in captive White rhinos is very low: 17 (5.12) of the animals registered in the Studbook have so far died, i.e. 4·7% of the total stock; 5(2.3) of these were born in captivity, a slightly higher proportion (11·4%) of deaths than in the population as a whole.

There has been a marked increase in the birth rate in recent years. From the five zoo-born calves that had been recorded up to 1971, the number of surviving young has now risen to 39 (24.15) (see Fig. 2). In contrast to the Black rhinoceros, ♂ calves are in a majority. The largest number of young have been recorded at San Diego Wild Animal Park (11.9) and at Whipsnade Park (6.5). In both these establishments White rhinos are kept in large herds, much as they would live in their wild habitat. Unlike the mainly solitary Black rhino, with its

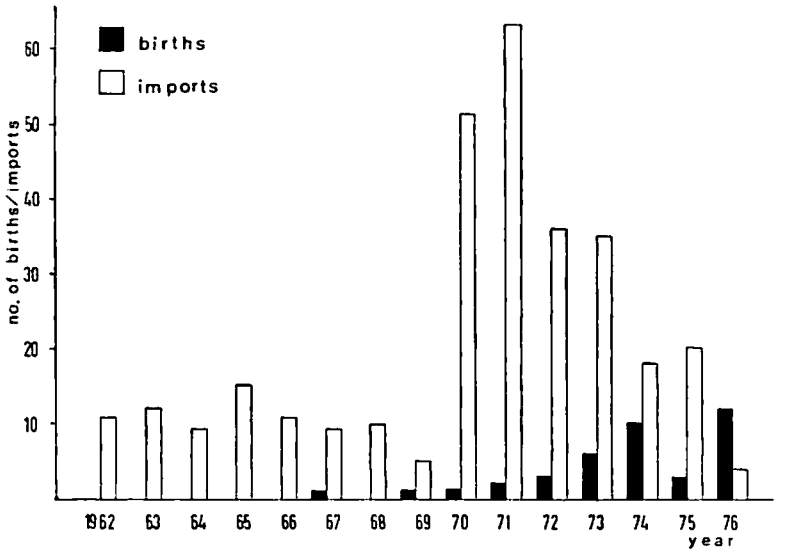

Fig. 2. Captive births and imports from the wild in the White rhinoceros *Ceratotherium simum* between 1962–1976.

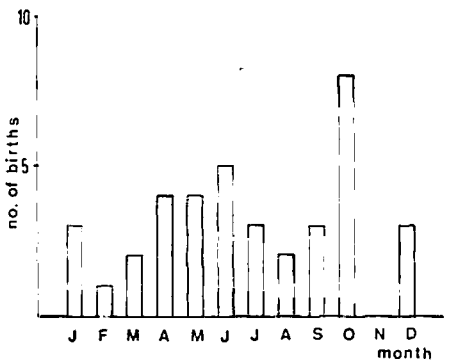

Fig. 3. Monthly distribution of births in the White rhinoceros, 1967–1976.

fixed territory, the White rhino is a social, group-living animal in which the boundaries of individual territories often overlap. Since territorial bulls allow non-territorial ♂♂ to live within their territories, it is possible, as at Whipsnade and San Diego, to keep several ♂♂ together in the one herd; the crucial factor in breeding this species seems to be sufficient space and a large number of ♀♀.

It is to be expected that in this species also, an accelerating birth rate will allow the number of imports to be reduced. As can be seen from Fig. 2, imports have diminished by more than 30% between 1971 and the present, while the number of births in this period has risen more than threefold. The ratio of animals taken from the wild to births during the period 1971–72 was 38:1, but between 1974–76 this relationship had improved to 2:1.

As in the Black rhino, the average age of zoo-bred individuals is also low, 23 months for ♀♀ and 40 months for ♂♂. While the majority of zoo-bred Black rhino ♀♀ have by now reached maturity, the White rhinos will not do so for some years yet. The higher average age of ♂♂ is due to the fact that between June 1967 and December 1972 there were only ♂ calves born. The birth season is evenly distributed, with a slight peak in May-June and October (Fig. 3).

Seven White rhino ♀♀ have produced two or more young. The average birth interval is 31 months, somewhat shorter than in the Black rhino. This can probably be explained by the fact that the majority of births have occurred where the animals have been kept in herds. When they are housed in pairs in small enclosures, with no additional accommodation available, the adults can mate only after the calf has been sent away, and this is not usual before the age of about 14 months. As the trend is towards keeping this species in herds, one may hope that

the birth rate will continue to rise, especially as many of the animals in captivity are only now reaching maturity.

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