

applied to the frequency of comfort behaviour and agonistic behaviour. On the other hand, there was a clear tendency for the occurrence of sexual behaviour to fall with an increase in the number of people around the exhibit. The penguins' dispersion pattern was apparently unaffected by the number of visitors. On the whole, the study concluded, visitors only affect the penguins' behaviour to a very slight degree.

Nikolaj Bock, Peer Ravn Jacobsen and Kaare Johnsen studied the social organisation of the black-tailed prairie dogs (*Cynomys ludovicianus*). By recording the animals' use of the entrance holes to the subterranean galleries and their social interaction, the social organisation of the colony was mapped out. The group consisted of two males and five females. There was apparently no hierarchy amongst the females, but they ferociously defended their favourite nesting holes against strangers, especially intrusively. The two males, on the other hand, had a clear hierarchy between them, and had in the beginning divided the exhibit and thus the females between them. At the end of the study period, the alpha male conquered the area of the beta male, and he subsequently controlled the whole area. The previous division into two coteries was apparently dissolved.

## MAGDEBURG ZOO, GERMANY

### Short report for 1994

1994 was a year of ambivalent character. To begin with the depressing aspects, we had a bad visitor attendance of only 414,000 (1993: 486,000). As in all other zoos in Germany, facing temperatures up to 36.4°C, only a few people were seen at our premises in the summer. A second drawback was the delay in completion of the

new waterfowl pond. The construction work was nearly finished at the end of the year, and the pond proved to be one of the most attractive waterfowl enclosures in zoos worldwide; its four ponds, with footbridge, reed-covered shores, islands and rest areas, make an exciting addition to the landscape of our zoo.

The animal department looks back to a very successful year. We bred colobus monkeys (*C. g. caudatus*) for the first time; other firsts were kookaburras and Ural owls. Seven species of marmosets and tamarins reproduced, but more important were the new arrivals from Mulhouse Zoo – a very fine pure-bred female emperor tamarin (*S. i. subgriseus*), for whom we need a male, and 1.1 red-handed tamarins (*S. m. midas*), the only pair of this species in Germany. We were preparing to send a golden lion tamarin to the U.S.A. to be placed in a 'pipeline zoo' and trained for reintroduction in Brazil, and to get a pair of black lion tamarins from Jersey. Magdeburg is the first zoo on the European continent to be trusted with the care of this rare species, a tribute to the work we had done with marmosets and tamarins over many years, and also to the dedication of vice-director Michael Schröpel.

New arrivals in 1994 included eastern grey kangaroos from Krefeld Zoo, red-cheeked macaws from Wilhelma, Stuttgart, an Abyssinian ground hornbill from Tallin Zoo, and several other additions to our breeding groups. More animals left Magdeburg than arrived, the most notable departures being three Persian leopards going to other zoos as recommended by the EEP coordinator, and a male Burma brow-antlered deer placed in quarantine at Leipzig Zoo before accompanying two females to Chester. All small cats which need heated indoor enclosures left the zoo in 1994; as we have specialised in such ani-

mals, this was a severe blow, but the enclosures were no longer tolerable and have therefore been pulled down. Three addax were flown to Morocco to be reintroduced in the Souss Massa National Park. Our old black rhino bull, Kibo, went on loan to Berlin Zoo where he started mating again; mating also took place between Eli, our bull from Dvur Králové, and our young cow, Mana. For the introduction Eli had been calmed down using a long-acting tranquillizer (Perphenazine).

Two important developments were the creation of a Friends of the Zoo Society, which will hopefully play an active role in the development of our zoo, and the start of a special educational programme for children. Two young women, employed under a job-creation programme, are setting up spare-time projects for children and juveniles focused on nature conservation.

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## ZOO NEGARA, KUALA LUMPUR, MALAYSIA

### Extracts from the Annual Report 1994 of the Malaysian Zoological Society

#### Bird Section

In 1994 the old displays in the bird section were undergoing reconstruction; they had been in use since the 1960s and were becoming increasingly difficult to maintain. The rebuilding work forced us to scale down our operations, minimising imports from other zoos and collection from the wild, exporting Negara-bred birds to other zoos, and putting breeding limits on our established pairs. The stock was moved to specially-constructed holding cages during this period. By the end of the year we had

started to move birds back into the new cages, and had some breeding successes. The most encouraging of these was with the great Indian hornbills (*Buceros bicornis*), a first-time breeding for the zoo. The wrinkled hornbills (*Aceros corrugatus*) bred for the third year, producing two male chicks some ten days apart. The rhinoceros hornbill (*B. rhinoceros*) and southern pied hornbill (*Anthracoceros coronatus*) nested without success. It was interesting to see that the female rhinoceros hornbill went through a full moult of primaries and tail feathers while in the nest; this has been reported for wild hornbills, but it did not appear to be true for the three occasions when our wrinkled hornbill nested.

In 1993 we had bred ostrich for the first time; this year a further 14 were hatched, but only seven could be fledged. Ostriches are, technically, a demanding bird to breed in the wet tropics; so far we are the only breeders of the species in the region, and we would caution any organisation without experience of non-domestic bird breeding not to invest in the species. We have found that ostrich eggs need a maximum humidity of from 45% to 55% to hatch – any more than that and the embryo will effectively drown. The minimum humidity in Malaysia is too high, over 90% for much of the day.

Storks performed well; both the free-flying painted storks and the caged milky storks bred. The black-headed ibis (*Threskiornis melanocephalus*) bred for the first time. We have had the species for many years, but they were pinioned and never bred. However, the last batch to be imported were full-winged; two years ago, when they had reached the pairing and nest-building stage, their cage was torn open and they escaped. All six escapees stayed in the zoo and joined the free-flying painted storks. This