A careful search finally yielded 16 tadpoles of various sizes. They appeared to be a few days old and had probably grown somewhat by eating most of their siblings (which turned out to be a blessing in disguise). Some of the tadpoles were placed in a 'floating barge' made by replacing the bottom of a compartmented craft box with screen and floating this in a 40-gallon (150-liter) aquarium with filter. Now each tadpole was safe in its own compartment from predatory siblings. Others were placed in individual bowls for rearing; but these required a daily water change due to the lack of filtration.

No one was prepared for the appetites of these tadpoles and the strain it would put on the staff just to feed and clean up after these 16 ravenous animals. They were hand-fed three times a day and would consume incredible amounts of food. The first time we fed them we thought they were deformed, because they had irregular lumps sticking out all over their bodies. These were just places where the packed stomach pushed out the body wall. Keeper astonishment at their growth rates was expressed daily – 'They couldn't have grown that much' – 'Good grief, are those the same animals I saw yesterday?' The tadpoles could double their mass in three days. Naturally this was reflected in their food consumption. For example, one tadpole less than two inches (50 mm) in length ate five goldfish, one earthworm and three small guppies in one day.

Fourteen of the 16 original tadpoles survived. When they metamorphosed after 14 days, we breathed a sigh of relief and assumed the eating would slow down: but it was not to be. In one ten-day period the young frogs consumed 1,500 earthworms along with countless pinkie mice and goldfish. The frogs were so ravenous that when food was offered on tongs they would leap high in the air, grabbing food and tongs, and dangle there in mid-air. Finally, as they approach adult size, we have managed to reduce their food intake somewhat and take a deep breath. This incredible growth rate is doubtless due to their adaptation to life in temporary ponds. The tadpoles must grow fast enough to metamorphose before the pond dries up, because, unlike adult frogs, they could not survive the dry season in the mud at the bottom. In the wild, the tadpoles survive in these sterile ponds by consuming most of their brothers and sisters, so that only a few grow to adulthood with the rest becoming nutrients for the biggest. Most of the Budgett's frog's biology (its growth rate, ravenous appetite, willingness to eat anything that moves, and ability to form a cocoon) is dictated by the demanding habitat in which it lives.

Sheila Lindquist, Charlie Radcliffe and Vern Veer in *Zoo Review* (Fall 1995)

Endangered Species Breeding Unit, Martin Mere, Lancashire, U.K.

The 1996 breeding season at the Unit has, so far, been extremely productive, with Bosca's and Montandon's newts breeding for the first time. Schmidtler's smooth newt and Italian newt also spawned. Zoos do not usually get very excited about newts, but these species are exceedingly uncommon in captivity in Britain and have limited ranges in the wild. However, most exciting has been the successful reproduction of the Anatolian newt (*Neurergus strauchi*), a Red Data Book species which may never previously have been bred in this country.

In 1995 2.8 ladybird spiders (*Eresus cinnaberinus*) arrived here via Ian Hughes of Dudley Zoo, from Denmark, as part of a joint English Nature/Federation of Zoological Gardens project to establish protocols for rearing this species, which is on the verge of extinction in Britain and threatened in many parts of Europe. So far, the project has been a success, with five cocoons produced. At the beginning of 1996 four of these hatched a crop of over one hundred spiderlings. If rearing techniques are successful then *ex situ* rearing may be attempted using British ladybird spiders.

In association with other British zoos we have also been successful at breeding the endangered tadpole shrimp, which now occurs in only one British site. If a captive population can be firmly established, then the possibility of establishing new wild populations can be contemplated by English Nature. Kerry spotted slugs continue to do well, and groups have been sent this year to Twycross Zoo and the World Owl Centre.

New to the collection are 0.0.10 *Trochomorpha* snails (from the Zoological Society of London), 0.0.4 *Asperitus inguitas* snails and 2.2 forest dormice (*Dryomys nitedula*).

P.J. Wisniewski

Kiev Zoo, The Ukraine

On 28 December 1995 our female Tien-Shan (or 'red') brown bear (*Ursus arctos isabellinus*) decided to celebrate her 20th anniversary by giving birth to her 17th cub and, moreover, by raising it herself. For the last eight years the keepers have had to take care of her offspring because of her neglect. Probably this winter was too cold and temperatures of minus 25°–30°C in January did not encourage the female to leave the den; so this was an excellent opportunity for the cub to be fed and kept warm by its mother. Zoo staff and visitors have been able to observe this small family since 8 March, when for the first time both of them emerged from the den into the outdoor enclosure.

The removal of a developing cataract in a small vervet monkey was carried out successfully by the specialists of the Ukrainian Eye Microsurgery Center. This was the second case of cooperation between the zoo and the Center – three years ago they successfully treated the same problem in a young Bennett's wallaby. The eyesight of both animals was restored.

Each year our Far-Eastern badgers (*Meles meles amurensis*) present the zoo with offspring. Two pairs of wild-caught animals have been kept here since 1989. The first cubs (2.0) were born in 1991, and successfully hand-raised because of the female's neglect. In subsequent years all attempts to achieve success with mother-reared offspring have failed. This year we decided not to imperil the life of the latest cub, a male, so he is now being safely hand-raised by keepers.

T.G. Katchan and A.V. Nikitina

Magdeburg Zoo, Germany

Magdeburg has a very special tradition in keeping and breeding rhinos. The zoo opened in 1950, and up to the time when Kibo arrived in 1967 from Kenya its animal stock was dominated by native and domestic species and birds. The rhinos were among the first animals to change the face of the zoo towards the conservation-oriented collection we keep now. In 1967 no one at the zoo thought of breeding rhinos – the new house for pachyderms was built for two elephants, a pair of hippos and one rhino. Shortly after the opening of this house in 1968, Kenia came, and the park had its most valuable inhabitants – a pair of East African black rhinos (*Diceros bicornis michaeli*).

In the years that followed, the zoo's capacity for keeping rhinos was enlarged to the present five indoor stables. It was nine years before Mabu was born – the first rhino of any species born in the GDR. In 1981 he was followed by Mana. But then, without any obvious reason, breeding stopped until in 1992 Mabu was exchanged for Eli from Dvur Králové in the Czech Republic. Mabu proved his breeding abilities there, but Eli behaved very badly towards our two females – he several times pushed them into the moat surrounding the enclosure, and came near to throwing 1,000-kg Mana over the fencing of the back run.

At this point the management decided on two measures. First, our old male, Kibo, was sent in April 1994 on breeding loan to Berlin Zoo. (The decision aroused an intense discussion in our zoo, whether one should move an old animal or not, but the argument that finally prevailed was that we should use the last chance to breed from a valuable wild-caught animal.) Secondly, Eli was calmed down using a long-acting tranquillizer, Perphenazin. His next meeting with the older cow, Kenia, took place three days after the injection of the tranquillizer. Previously Eli had immediately attacked the female as soon as he entered the enclosure. This time he first sniffed at her body and then started to chase her around. But after a while she found a place where he was unable to turn, cornered him and struck him with her full strength. Eli was obviously impressed and from then on maintained a respectful distance. The next day, while he was still in this bewildered state of mind, we introduced him to Mana. Everything went well, we even observed the first mating, and in the following months we could keep all three rhinos together.

But there was a severe setback when Eli died in February 1995. The black rhino was always a key species in the zoo's programs for breeding endangered species, so a desperate search for a new rhino bull started. But no bull has yet become available in a European zoo. However, Eli left something behind – Mana was pregnant and on 23 December 1995 delivered her first calf, a little female weighing 35 kg. She was given the name Malaika, which is the Swahili word for 'angel'. Less than two months later Kibo's first offspring was born in Berlin. Little Ndugu – which means 'brother' – is a long-awaited addition to the population carrying the genes of a poorly-represented founder.

Magdeburg Zoo would like to contribute to the conservation of rhinos even more in the future. A major reconstruction of the outdoor enclosures will be finished this summer. All our efforts are concentrated on finding a new rhino bull in an overseas collection to introduce a new bloodline for the European population.

Klaus Wünnemann

Marwell Zoological Park, U.K.

The opportunity to release a small bachelor group of Przewalski's horses into a large (103 acre, 42 ha) enclosed area at Eelmoor Marsh, Farnborough, came about almost by chance. There was a need to establish single-sex groups as part of the EEP, while at the same time the Hampshire Heathlands Project was looking to return unmanaged heathlands to their former glory by bringing back the livestock which once used to be 'run on the common'. As the Site of Special Scientific Interest (SSSI) at Eelmoor Marsh was to be securely fenced and, being within the confines of the Defence Evaluation and Research Agency (DERA) site at Farnborough, would have no public access, it was the ideal solution to bring the two together.

Eelmoor was designated as a SSSI on account of the unusual assemblage of rare plants and invertebrates that it supports. Despite its name, only a small proportion of the total site consists of wetland areas. However, these are home to several unusual specialist plants such as sundew (*Drosera rotundifolia*) and butterwort (*Pinguicula vulgaris*), as well as large populations of dragonflies and damselflies (about two-thirds of all those recorded in the British Isles), and the raft spider (*Dolomedes fimbriatus*), one of Europe's largest spiders, with a body up to 20 mm long. Other habitats are acid grassland, birch/pine scrub and heathland.

On the more open grassland, which the horses prefer, large numbers of butterflies were seen during the exceptionally favourable summer (24 species recorded this year). The site used to have the marsh fritillary (*Eurodryas aurinia*), a species in rapid decline, but although none were seen this year a close watch will be maintained as it may return if the grazing recreates the right conditions. Throughout the summer prickly plants such as marsh thistles (*Cirsium palustre*) have made interesting browsing for the horses, who were frequently seen delicately taking the tops off; patches of gorse (*Ulex europaeus*) dotted across the entire SSSI may also become more appetising later in the year, as it is known to provide winter food for ponies in the New Forest.

Eelmoor Marsh is of interest to a wide variety of naturalists. A member of the DERA's Conservation Group has cross-pollinated by hand some marsh helleborine (*Epipactis palustris*) to provide seed for the Sainsbury Orchid Project at Kew Gardens. Unfortunately, when he came to collect the seed pods, half of them had been eaten! Some temporary electric fencing managed to save the rest, but next year a proper programme of protection for the critical species during their flowering and seeding periods will be implemented. Grazing will, however, have an overall beneficial effect across the whole range of species on the SSSI. One or two species have even made an appearance as a result. The eggshell fungus, which grows only on the dung of horses, is a frequent sight, and another arrival, which was only occasionally recorded before, is a large blood-sucking fly, *Tabanus sudeticus*; it has a wingspan of nearly 40 mm but, thankfully, is only active for a few weeks in July and August!

The introduction of the five horses is part of the management strategy to conserve the native plants and animals that colonise this area. Sicaron, the former breeding stallion at Whipsnade, and Billy, a colt born to a group of Marwell mares on loan elsewhere, arrived in May. They were followed by Makan, Marwell's former breeding stallion, in June, Sirano (a colt) from Whipsnade in July and, finally, another colt, Konan, from Marwell in October. Fifteen Friesian-cross heifers arrived a week before the first horses. In former times the animals run on heathland would have created a mosaic of vegetation patches under different grazing pressures, providing a range of habitat types for a diverse fauna and flora. Although the horses will be a permanent feature of Eelmoor Marsh, the numbers of cattle will be changed each year, and perhaps different breeds tried, to try to recreate the same conditions as in former times.

As expected, the two stallions initially fought for dominance and some of these displays of strength and stamina were quite spectacular. The stallions were actually vying with each other to see who would 'look after' the younger horses; in this kind of situation the colts remain submissive and