

254 sq. m and symbolises a type of Mohammedan temple seen in the central part of Kenya. The lions are not allowed into the bus station.

The Lion Bus is 8.695 m long, 2.460 m wide, 3.100 m high and can seat 52 people. Windows are made out of double glass, each pane 10 mm thick. The roof of the bus is made to support a weight of up to 1,000 kg (i.e. the equivalent of the weight of four lions). The bodywork of the bus is of steel, about twice the strength of that used in ordinary cars, and the materials used inside the bus are non-inflammable. In an emergency the door at the back end of one bus can connect with the other bus and people can thus be transferred safely from one vehicle to another.

Living in the park there are 10 male lions, two female lions, one female lion that has been spayed and two cubs. The lions came from a number of zoos all over Japan and it was thought there would be considerable difficulty in introducing them all into the same enclosure without fighting. However, as it turned out, fighting was not nearly as severe as we had imagined it would be. Lions under three years old hardly fought with each other at all, though the full-grown males had several serious fights. Newcomers to the group were invariably attacked. However, they had all settled down at the end of a month. The lions have now been together for 10 months but a male leader has so far not emerged. Most of the fighting is caused by the females.

RHINO, TAPIR AND OKAPI HOUSE AT WEST BERLIN ZOO

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IN July 1964 a new heated house with spacious enclosures for rhinoceroses, tapirs and okapis was opened to the public at West Berlin Zoo. It was built on the additional area of ground given to the zoo in 1959. This area also contains the new bird house, the pheasantry, the riding stable and the camel house. The rhino, tapir and okapi house was designed by the architect, Diesing, in close co-operation with

the zoo's scientific staff. As with all new buildings at West Berlin Zoo, the new house is built on an east-west axis. This means that the public area is on the north side, while the stables and outdoor enclosures face south—in our climate this position makes the most of the best weather conditions. The whole building is 190 ft long and 45 ft wide. It is divided into two sections, one for rhinos and one for tapirs and okapis.

The rhino section consists of six dens (1), a breeding den (2) and a water pool (3). Each of the six dens covers an area of about 26 to 27 sq. m. The pool is 4.70 m wide and 6.00 m deep, covering an area of 28.20 sq. m. Eight steps, covered with a special slip-proof surface, lead down into the water. The breeding den is situated in the western corner of the rhino section. It is separated from the other dens by solid walls and also by solid sliding doors. The animal dens are separated from the public by a ditch 1.60 m wide (8). The public area (5) is about 33.5 m long and 4.10 m wide. There are two entrances and each is screened to prevent draughts and loss of heat from the building.

The service corridor (4) is situated behind the rhino dens. It is 1.50 m wide and leads to the food store (6) and the dung yard (7). All animals have to cross this corridor on their way to the outside enclosures. Therefore, both the den door and the door of the outside enclosure open in opposite directions, thus forming an enclosed passage for the animals. The food store covers an area of 20.70 sq. m.

The public area leads into the tapir section and in the south-eastern corner of this there is an enclosure for okapis (10). It covers an area of 59.40 sq. m and consists of two dens, partly out of sight of the public, and a large inside enclosure. The tapir section (9) consists of three dens (so that the animals can be separated during the night) and is on the eastern side of the house. It has an area of 37.25 sq. m. The moat (8) between the dens and the public also serves as a bathing pool for the animals. Food store (6), service room (11) and dung yard (7) on the northern side of the house complete this section.

In front of the house there are five outdoor enclosures (12). They extend the whole length of the building and consist of three enclosures for the rhinos, one for the okapis and one for

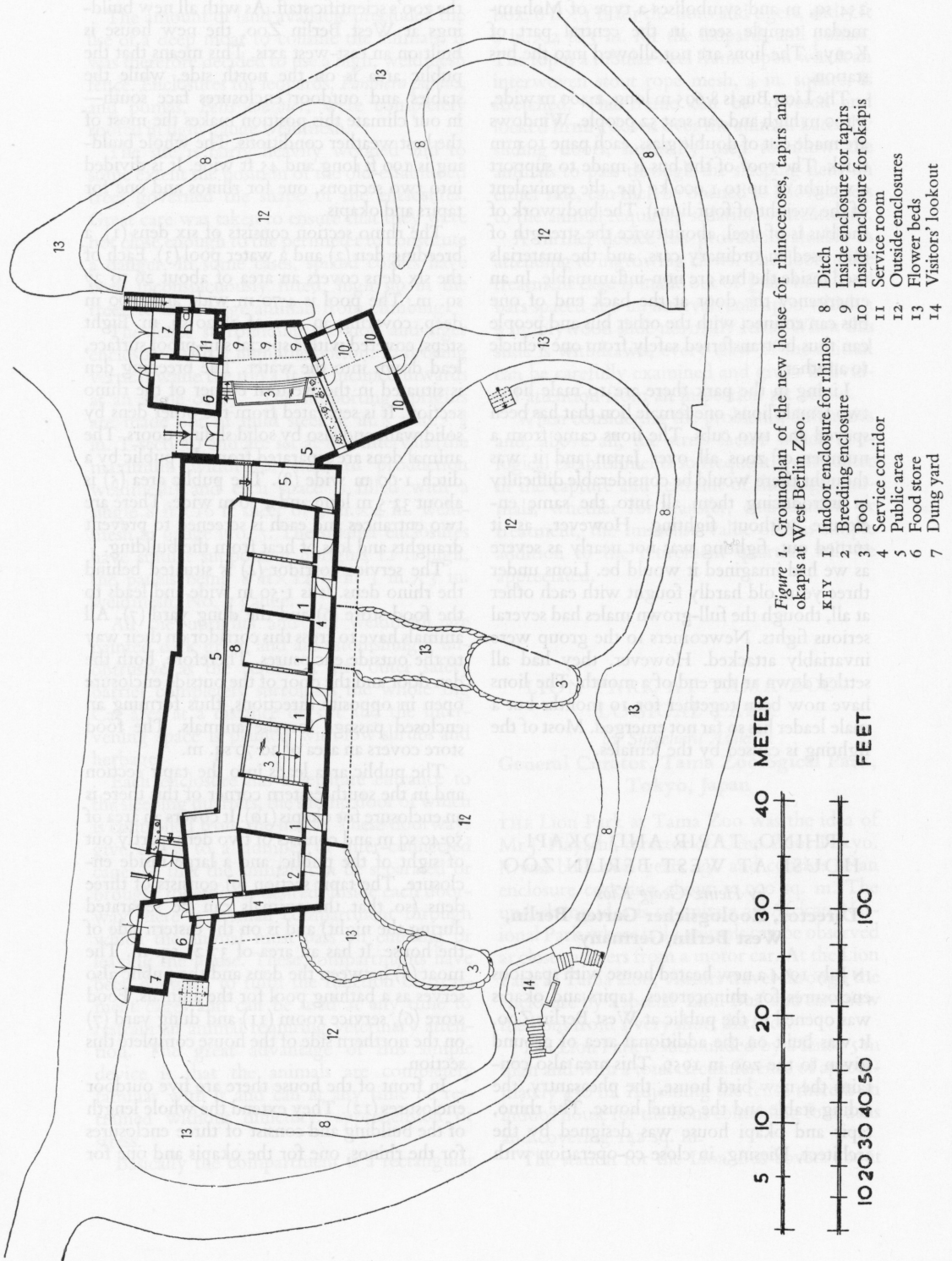


Figure 1. Ground plan of the new house for rhinoceroses, tapirs and okapis at West Berlin Zoo.

the tapirs. All the enclosures are separated from each other by ditches (8) and flower beds (13) with trees and shrubs. From right to left they cover areas of 29,800 sq. m, 43,500 sq. m, 53,500 sq. m, 49,800 sq. m, and 35,800 sq. m.

The house is heated by a warm-air-system.

In June 1965 the Rhino, Tapir and Okapi House contained one pair of Black rhinoceroses, *Diceros bicornis*, one pair of White rhinoceroses, *Diceros s. simus*, one pair of Indian rhinoceroses, *Rhinoceros unicornis*, four Malayan tapirs, *Tapirus indicus*, and one male okapi, *Okapia johnstoni*.

The history of the Indian rhinos is a good example of co-operation between zoos in the interests of animal breeding and conservation. The original adult male Indian rhino was sent to Basle Zoo to replace their breeding male which had died a few months previously; a young female rhino, bred at Basle, was sent in exchange. She was joined by a young male from Hamburg Zoo (see pp. 82-87 of the *Yearbook*). This particular animal was the offspring of the Hamburg female and the Basle male to whom the Hamburg female had been sent to be mated.

REMODELLED BIRD HOUSE AND NEW GREAT FLIGHT CAGE AT THE NATIONAL ZOOLOGICAL PARK

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AFTER 20 months of construction, the remodelled Bird House at the National Zoological Park was opened to the public in February 1965. The zoo staff and architect Richard Dimon redesigned the 1926 building, incorporating where practical the following principles: all exhibits to be viewable at the eye level of a 28-in. child as well as by adults; visual barriers between birds and visitors to be eliminated or minimised through the use of curved glass, straight glass, fine stainless-steel vertical wire and walk-through exhibits; exhibits to be placed on only one side of the public areas to help visitors to find their way and to create a one-way traffic pattern; wide

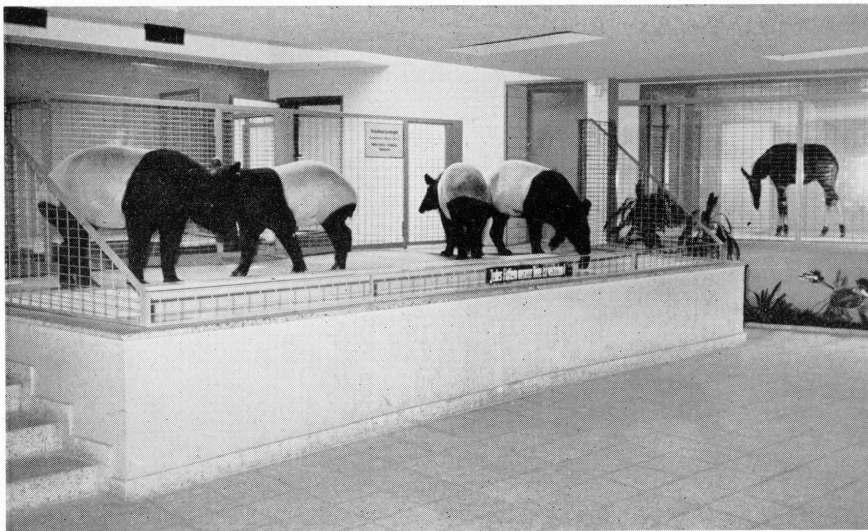
public areas to be provided to accommodate the ever-increasing crowds; wherever possible steps to be eliminated and ramps with a gradient of not more than 10 per cent to be used in their place; and labels to be placed at an angle of 45° a few inches above the floor so that they could be read by small children and by adults with varying sight capabilities.

The outside walls remained intact, as did the main floor of the Bird House and the basement area; but almost everything else was changed beyond recognition. The exhibit floor of the building covers 16,668 sq. ft, divided as follows: 6,500 sq. ft for the public, 600 sq. ft for the service area and 9,600 sq. ft for the bird exhibits.

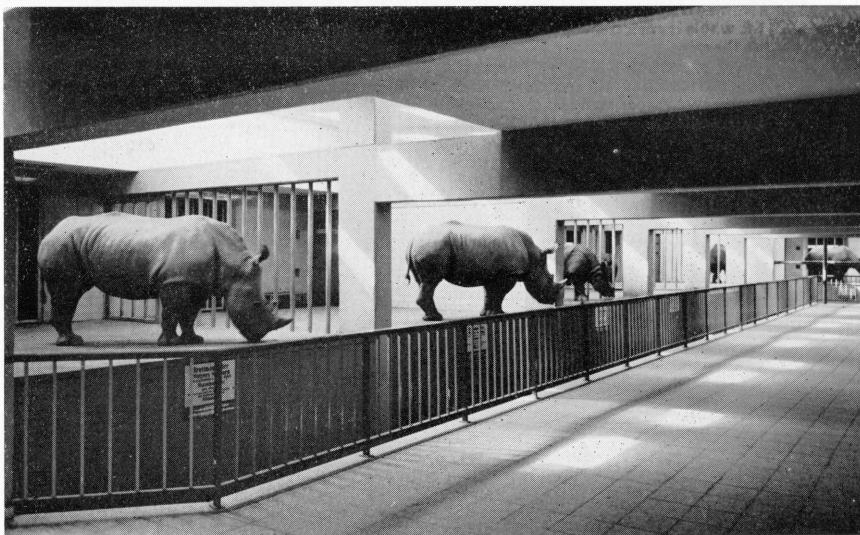
Exhibits in the Bird House are arranged to emphasise community groups of compatible birds rather than individual species and the 27 cages were designed for maximum flexibility. Of these, 12 can be joined together in groups of four by the simple removal of the plastic wall between the cages. Each exhibit enclosure has at least 2 ft of soil over a drain bed. Emphasis is placed on living plants where possible, although in some areas it was necessary to use high-quality artificial plants. Seven glass-fronted cages have a humidity range of 50 to 60 per cent, a temperature range of 65° to 70°F and light control. Two of these have recurved glass which gives the illusion of there being no barrier between the visitor and the birds.

Each wall of the building has one large plate glass window, combined with a cage, for lightness and airiness and to unite the inside exhibits with outdoor enclosures. On the west side, a window looks out into an eight-sided cage, 15 ft high and 27 ft wide, patterned like those at New Delhi Zoo. This outside cage is covered by 1-in. stainless steel wire mesh and is provided with heated perches on which the birds can roost in the winter. These perches have been used in the Park for several years. An electric heating cable, 5 watts per foot, is inserted into a metal tube or conduit, $\frac{3}{4}$ to 1 in. It has no temperature or other automatic controls. Since using these perches, the incidence of frozen feet and allied troubles has decreased. In the new bird enclosures, an electric heating element of polyvinyl insulated, moisture-proof, covered heating cable

47. View of the interior of the new house for rhinoceroses, tapirs and okapis at West Berlin Zoo (see pp. 127-29). The tapir section consists of three dens and the moat between them and the public serves as a bathing pool for the animals. The okapi section can be seen on the right. *Zoologischer Garten Berlin*



48. There are six rhinoceros dens in the new West Berlin rhinoceros house. Each covers an area of about 27 sq. m. The house is also provided with an indoor bathing pool, 6 m. deep and covering an area of 28.20 sq. m. The dens are separated from the public by a ditch 1.60 m. wide. Outside the rhinos have three enclosures. *Zoologischer Garten Berlin*



49. The tapir enclosure at West Berlin Zoo is separated from the public by a concealed ditch. Trees, flower beds and shrubs are also used to hide ditches and other barriers. *Zoologischer Garten Berlin*

