total belt length of 312 ft. The ride takes three minutes. Since the moving sidewalk makes it easy for the visitors to ascend the canyons, it encourages them to see those areas featuring bears, big cats, sea lions, ground birds and small mammals. Additional moving sidewalks are planned for the future so that all remote areas will be within easy foot-distance from the entrance, despite the up-and-down topography of the San Diego Zoo Grounds.

# ARCHITECTURE

## THE USE OF MOATS IN ZOOLOGICAL GARDENS

*by R. Bigalke*

**Director of Pretoria Zoo, South Africa**

MOATS or ditches when used as barriers in zoological gardens in Europe and the United States are nearly always filled with water. It is the water that is actually intended to confine the animals, but there are certain disadvantages in its use. In the first place, the use of water in large quantities is expensive unless an adequate and cheap supply is available from springs, as is the case in the Munich Zoo. Generally, however, water must be drawn from municipal supplies and this makes maintenance expensive.

Another disadvantage is the rapid growth of algae in the water, particularly in the summer months. Good algicides are now available, but the frequent treatment of the water in large moats absorbs much time and labour. If the algicide is a poison, special care must, of course, be taken to prevent animals from drinking the water while it is being treated.

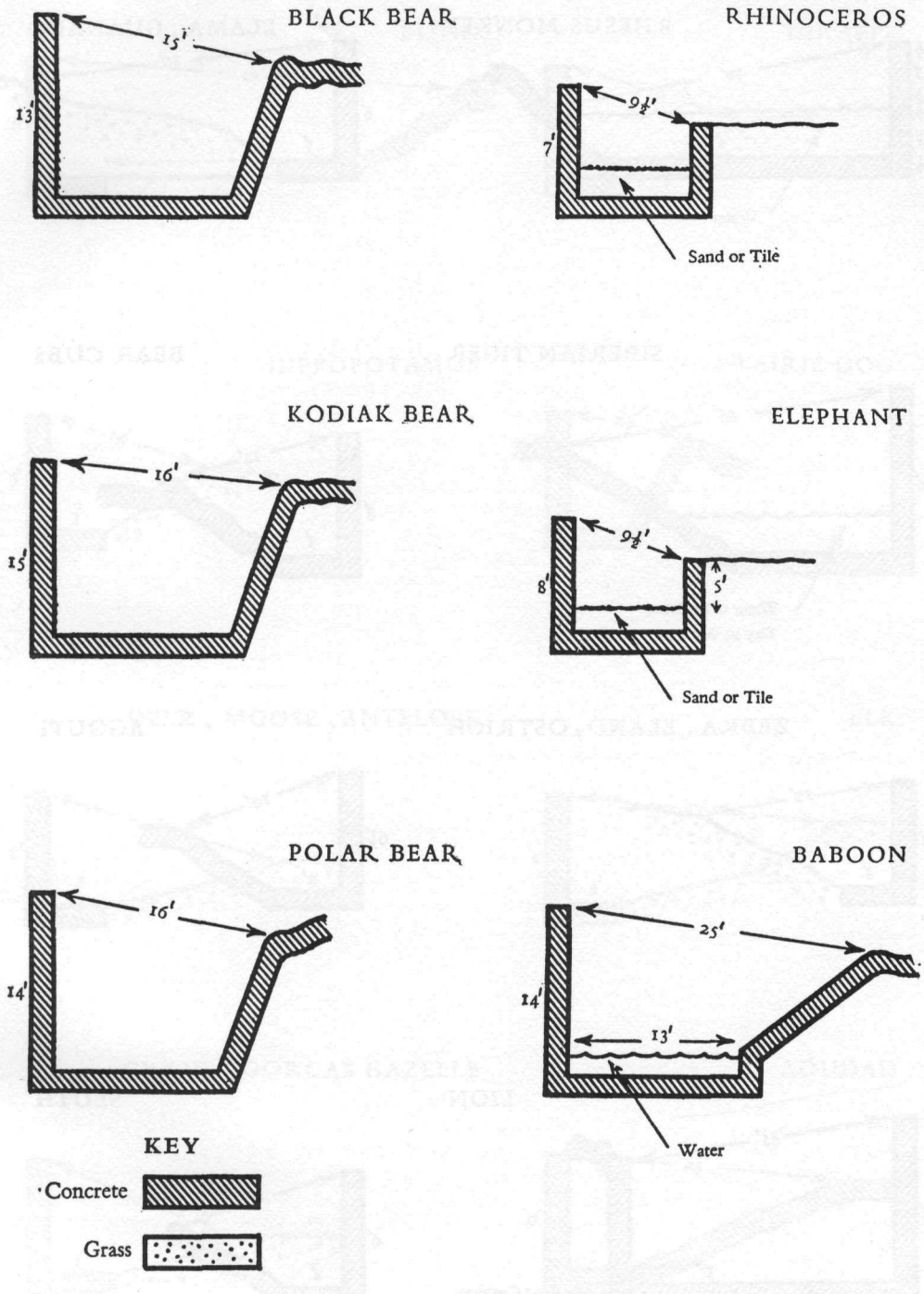
A third disadvantage is the ever-present possibility that dangerous animals may escape by swimming across the moats. If a lion or a tiger decides to do this, the results may well be serious.

In volume one of the *International Zoo Yearbook* (1959) Mr G. S. Mottershead describes three cases in which chimpanzees escaped across a moat in the Chester Zoo. In one instance a female escaped with her baby by wading across the moat. While this was an exceptional case, every director of a zoo must be prepared for unexpected incidents and needs all his ingenuity to design enclosures from which dangerous animals are unable to escape.

The disadvantages enumerated above may be avoided by making the ditches sufficiently deep and dispensing with the use of water. This has been done in the newer part of the National Zoological Gardens (Plate XVIII). Along the northern boundary of the zoo there are low quartzite hills and on their slopes large enclosures have been built for lions, cheetahs, bears, monkeys, Barbary sheep, tahrs and mouflons. The enclosures for lions and cheetahs may be the largest in the world, measuring as they do 285 ft. × 150 ft. On three sides their perpendicular walls are sunk below the surface level to a depth of about 20 ft. with ditches along the walls. The floors and inner slopes of the ditches, which are wide at the top and narrow at the bottom, have been paved with stone and slate. If the animals are in the dry ditches they can get to the large well-wooded middle part of the enclosure by using paved paths and a short flight of steps at the upper end of the lower path (Plate XIX). They use these paved paths, but where the pitching is rough they often climb straight up or down the sloping sides. The dry ditches serve as stormwater channels. In the case of heavy thunderstorms, or after long periods without rain, some silt collects in the ditches, particularly on the front side of the enclosure. But this is not, as a rule, a serious matter and does not require frequent attention.

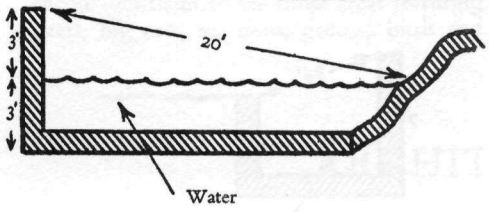
As the object of this short article is to emphasize the advantages of dry ditches or moats for confining wild animals in zoological gardens, the modifications in some enclosures for some of the animals referred to in the previous paragraphs need not be dealt with here.

1. Dimensions of animal enclosure ditches at Detroit Zoo, U.S.A. (*See p. 67 of the Yearbook*)

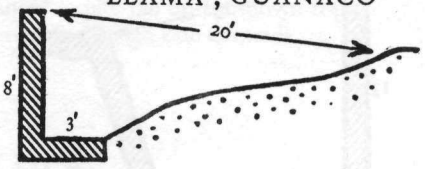


2. Dimensions of animal enclosure ditches at Detroit Zoo, U.S.A. (*See p. 67 of the Yearbook*)

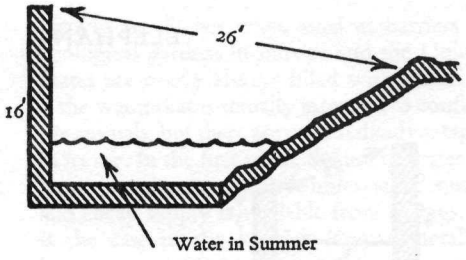
RHESUS MONKEY



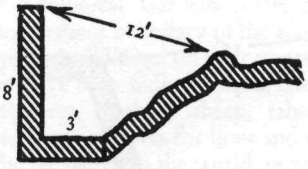

LLAMA, GUANACO



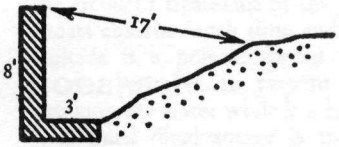

SIBERIAN TIGER



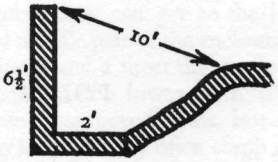

BEAR CUBS



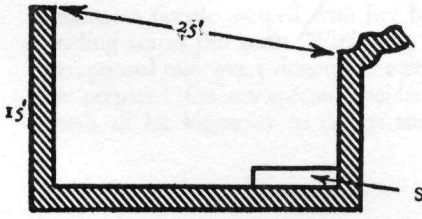

ZEBRA, ELAND, OSTRICH



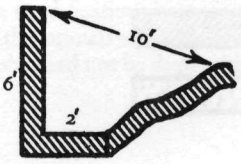

AGOUTI




LION

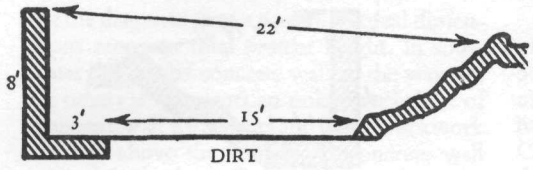



SLOTH

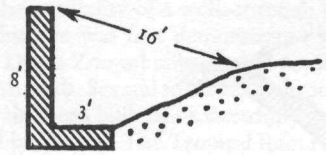


3. Dimensions of animal enclosure ditches at Detroit Zoo, U.S.A. (*See p. 67 of the Yearbook*)

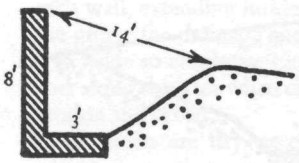
BISON



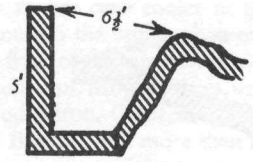

GIRAFFE



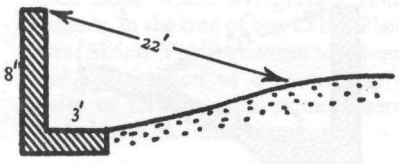

HIPPOPOTAMUS



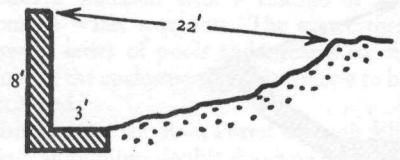

PRAIRIE DOG



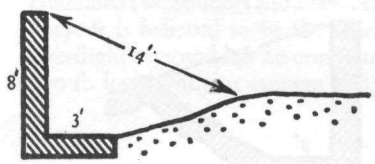

DEER , MOOSE , ANTELOPE



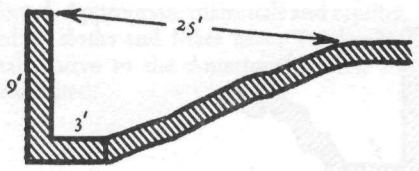

ELK




CRANE , DORCAS GAZELLE

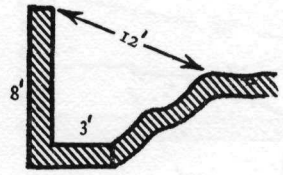



AOUDAD

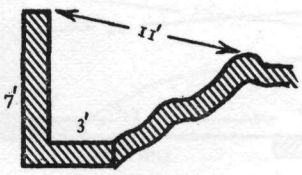


4. Dimensions of animal enclosure ditches at Detroit Zoo, U.S.A. (*See p. 67 of the Yearbook*)

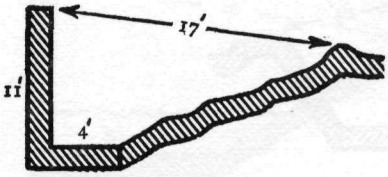
WOLVERINE



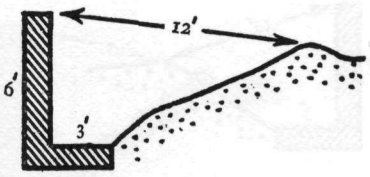

ANTEATER




COYOTE




TAPIR

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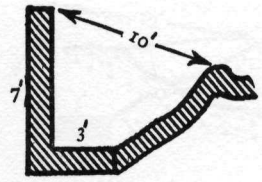
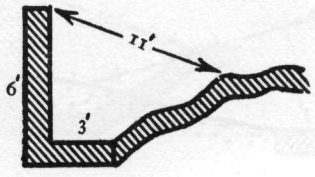
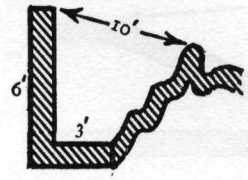



PECCARY




AFRICAN PORCUPINE




RACOON