

## THE BURROWING BEHAVIOUR OF CROCODILES

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Although it is well known that the Monitor Lizard *Varanus niloticus*, excavates or burrows into river banks and utilizes these burrows during the winter months, similar behaviour by crocodiles has only been briefly described, Pooley (1962).

Further observations reveal that young crocodiles are not only adept at burrowing, but that their survival depends on this ability to find shelter during cold weather conditions and in relatively cool climates.

On March 15th, 1968, ten crocodiles varying between 15 to 20 inches in length were placed in a mud pool 8 feet in diameter, with a vertical bank ranging in height from 6 inches to 24 inches around its perimeter.

After a week of cold weather conditions, it was noted that the crocodiles had started to burrow, and after three weeks, a tunnel 5 inches in height, and 10 inches wide at its entrance, had been excavated into the bank above the water level of the pool. The tunnel was 24 inches long and opened out into a larger cavern which accommodated the ten crocodiles in this pool.

A week later, on March 21st, 1968, similar behaviour was noted in a larger earth dam holding sixty, one-year-old crocodiles. These animals had been in the dam for over three months, but as with the first group, burrowing only commenced during a spell of cold weather. Three separate excavations were found and these crocodiles ranged in size from 24 to 36 inches in length.

Coinciding with the commencement of burrowing, and the cold weather conditions, feeding stopped and the crocodiles could not be induced to accept any form of food.

By the 7th May, 1968, nine burrows were in use and it had been noted prior to this, that unless weather conditions were warm and sunny, the entire group remained in the burrows. Even on a sunny day, only the largest animals would venture out to bask.

It was decided to open and examine the burrows, and this proved to be a difficult task. Four labourers with picks and shovels worked an entire day to dig down to these tunnels. The bank was between 3 and 4 feet high above the level of the water and was of a hard clay-like consistency.

The longest tunnel was found to penetrate for a distance of 12 feet, three were over 9 feet and the remainder between 4 and 6 feet in length. The tunnels or burrows were straight and level, so that if the water level of the pool had risen several inches, the tunnels would have been flooded. The crocodiles were found at varying

distances along these tunnels, where these had been widened sufficiently to enable them to turn around. Almost all were facing outwards towards the entrance, and were difficult to extricate because of this. They were lethargic, made no attempt to bite, or to escape, but dug in their claws and braced their bodies within the tunnel. Thus it was impossible to grasp one by the neck and pull it out without causing injury. At the end of each tunnel 5 or 6 crocodiles were found packed together, tightly wedged in two or three layers.

Once removed from the burrows and in daylight the crocodiles protested vocally and struggled vigorously. Thirty of the largest were released into Lake St. Lucia as part of the re-stocking programme and thirty were introduced into an earth dam to make further observations.

Within a week, 6 tunnels had been excavated and all were over 3 feet in length. At this stage the water level of the dam was raised about 9 inches to flood them out, with the result that the new tunnels were enlarged so that the crocodiles could swim into them. The rate of progress beyond a depth of 3 feet, was not checked as it was likely that a measuring rod inserted into a tunnel would probably damage a crocodile.

### METHOD OF BURROWING

Burrowing was found to take place at night, probably because the drop in water and air temperatures then spurred them on to burrow and seek warmth. If disturbed by torchlight when engaged at this task, the crocodiles would move away from the site of excavation and it was difficult to establish how it was done. Initially it was thought that the burrows were started by scraping at the bank with their claws, but further observation revealed that they actually bit into the bank just above water level, where the soil was soft. Usually the approach to the bank was at an angle, and with a determined rush to actually bite. Then with the mud in their jaws they reversed into the water and submerged, shaking their heads from side to side, presumably with jaws wide open. Eventually they rose to the surface behind a swirl of muddy water, rested for a few minutes, and then repeated the process. As many as three crocodiles were seen working together at the same excavation.

Apart from this method of burrowing, other crocodiles were noted at various times performing peculiar movements in the water off-shore from the burrow entrances. The crocodiles would be seen lying parallel to the bank and would perform backward scraping movements with their hind feet or else remained in one spot, thrashing their tails from side to side. Similar behaviour was noted inside the entrance to burrows.

#### THE USE OF BURROWS

During June and July, frost was recorded on the floodplain for the first time in five years and many young crocodiles housed in cement pools succumbed to the cold or developed respiratory diseases. During this period there were no deaths or signs of illness from any of the mud pool populations. Accordingly, one hundred crocodiles between 3 and 4 months old were transferred to similar mud pools. Within one week, all had burrowed into the banks - an average of five animals to each burrow. Of particular interest was that each burrow was excavated in the south and south-east bank of the several ponds, thus gaining protection from the prevailing cold winds. Locally, rain and cold winds come from this direction whereas north winds which are warm, blow directly into the burrow entrances.

During June, July and August, food was not accepted and as with the year-old animals, if weather conditions were cold, the entire populations remained in the burrows only venturing out when conditions were sunny. Feeding commenced in September when the weather warmed up.

Another important function of the burrow is that at any sign of danger or disturbance, the young crocodiles would scuttle into them and disappear. In the natural state, where the young have no defence against predators, these burrows must afford protection to many that would otherwise fall easy prey to avian predators, in particular.

It was noted too that during hot weather the young crocodiles preferred to remain in the shade of a burrow, rather than lie exposed in the water.

In two test pools the water level was allowed to drop until these pools were almost dry. It was noted that the crocodiles then burrowed downwards into the mud, hollowing out a basin shaped cavern until they found water at a lower level than the water remaining in the pools. Similar behaviour has been noted with adult crocodiles under drought conditions, Pooley (1962). Two crocodiles 'holed up' under the roots of a large Fig tree *Ficus sycamorus* growing on the bank of the dry Mkuze River bed. A basin was hollowed out behind the roots and a pool of water was conserved for over two months, until rain brought the river down in spate.

This pool of water was important to many small game mammals, and birds, as well as amphibians, insects and fish. Food was also plentiful to the crocodiles and on one occasion the hindquarters of an inyala *Tragelaphus angasi* were found in the water, at the entrance to the hide-out.

Craighead (1968) in a fascinating account of the ecology of the Alligator in the Southern Everglades, describes a typical alligator hole as a reservoir for an amazing biological assemblage. Within them lives a very complex assortment of aquatic organisms, plant and animal, diatoms, algae, ferns, flowering plants, protozoans,

crustaceans, amphibians, reptiles and fish. Many warm blooded animals and birds derive their sustenance from these pools, either directly from the organic and mineral substances found there, or by preying upon one another.

It is interesting to observe the similarities in habits between these closely related, yet widely separated reptiles.

#### ACKNOWLEDGEMENTS

I am most grateful to Mr. J. Geddes Page, Director of Nature Conservation in Natal, for his suggestions and advice on the construction and value of earth dams. Mrs. von Notten, Reference Librarian, Durban City Library is thanked for her kindness in obtaining references. Mr. William B. Robertson, Biologist, Everglades National Park and Michael J. Fogarty, Biologist, Florida Game and Fresh Water Fish Commission are thanked for their enthusiastic response to requests for literature.

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