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PIGMY CROCODILES IN UGANDA

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THE contribution by Mr. E. A. Temple Perkins on the subject of the first finding of a pigmy crocodile in Uganda, which appeared in *The Uganda Journal*, Vol. 15 (1951), can be conveniently elaborated. An illustrated article by the writer concerning 'African Pigmy Crocodiles' was published in *The Field* of 17 February 1951 and, with the much appreciated permission of the proprietors, the photographs and some lengthy extracts are here reproduced.

The discovery in 1948 in the Western Rift of an example of the small, forest crocodile *Osteolaemus tetraspis*, a riverine species which is sparingly distributed throughout the equatorial forest region, but which was not known to occur east of the Ruwenzori range, created a minor sensation for hitherto the crocodile had been unknown in the Lake George–Lake Edward region. The presence of this unwelcome predator boded ill for the local, and extremely profitable, fishing industry. Its presence in a small stream, the Hoindagi, at the south-eastern end of Lake George, might never have been revealed had it not been for prospecting operations, which resulted in the creature falling into a test-pit dug within fifty feet of the river in which it lived.

Luckily for the fishing industry, *Osteolaemus* is not a lacustrine species and, although it subsists mainly on fish and crabs, its depredations are negligible. Where there is one, others are likely, but investigations have been inconclusive, though certain rather vague references indicate the possibility of a few of these crocodiles still existing in the swampy rivers flowing into Lake Edward from the east. Reliable information is almost impossible to obtain, as this region has for over thirty years been closed to human habitation as a precaution against sleeping sickness. Moreover, much of it is dense, tangled, swampy forest, almost impossible to traverse and likely to be entered only occasionally by an enterprising African in his crudely-fashioned dug-out.

In this locality *Osteolaemus* is presumably a relic of a distant past when climatic conditions were much moister, and when the swampy forest was more extensive. It rarely attains a length of five feet, and, unlike its large relative the Nile crocodile (*Crocodilus niloticus*), is not gregarious, usually occurring singly. In the equatorial forest region it is said to be extremely timid. It is darker than the Nile crocodile and has a short broad head, its belly is black, as is the inside of its mouth.

The breeding habits of *Osteolaemus* are adapted to the humid conditions of the rain forest, and it deposits its eggs in a mound of dead leaves and other vegetable matter which it scratches together. Incubation is left to the heat of fermentation. It is obvious that the requisite conditions will be found only in forest areas in which inundation is of such a nature that the ever-active and destructive termites are absent, for these insects would rapidly convert the mound of vegetation into humus. A nest found in the Congo has been described as, " In a natural hollow a heap of dead vegetable matter, not more

than five feet across and somewhat higher in the centre." This nest was on a high rocky point, completely surrounded by almost impenetrable *Raphia* swamps.

Although unexpected in the Western Rift area, the occurrence of *Osteolaemus* was not altogether surprising, for during the twenty-five years that I have been in Uganda I have always believed that it probably occurs in the rivers of the low-lying, swampy forest region of Bwamba, west of Ruwenzori, which is, in fact, an extension of the great Ituri forest.

The Hoindagi specimen was fed and kept alive in a pit, awaiting arrangements for its disposal, until it inexplicably disappeared. As it could not have escaped through its own endeavours, it must have been removed.

From time to time the very definite absence of crocodiles from these waters, which are so heavily stocked with fish, has been a source of controversy. The Semliki river flowing out of Lake Edward and into Lake Albert, in which latter crocodiles abound, should provide a ready route for them to traverse, notwithstanding the presence of some falls, which can be avoided by a not too difficult land journey—and the crocodile is a very enterprising traveller. The fact remains, however, and fortunately, that there are no crocodiles in Lakes Edward and George nor in the twenty-mile-long channel which connects them.

Many experts have tried to solve the problem, but there is one factor which so far I have not seen introduced into the argument, and this is mud. A crocodile, which spends so much of its time lying submerged on the bottom of its aquatic haunts, cannot exist where there is deep mud. It cannot breathe properly under such conditions and its movements are impeded. It is possible that there is too much mud in these lakes.

In 1919, as a result of the critical examination of three pigmy crocodiles collected in 1913 by the American Museum of Natural History Congo Expedition (1909–15) at Niapu, in the forests of the north-eastern Belgian Congo, Schmidt created a new genus *Osteoblepharon*, and he named the new species of crocodile, *Osteoblepharon osborni*. It was stated that it could be externally distinguished from *Osteolaemus tetraspis* by the lateral outline of the snout, which is not anteriorly raised, and by the anterior set of dorsal scutes. Further it was claimed that important generic and specific characteristics are to be found in the skull. At that time the largest of the four known examples of this new species measured no more than 3 ft. 9 in. in length. In 1925 Dr. Schouteden collected five juveniles at Poko, and in 1930 another juvenile at Kunungu: Dr. G. de Witte obtained seven more juveniles at Buta: these localities are all in the equatorial rain-forest region of the north-eastern Congo. This enabled de Witte, supported by certain observations previously made by Boulenger, to prove that *Osteoblepharon osborni* is in fact *Osteolaemus tetraspis*, for in crocodiles the nasal region is more elevated in the juveniles than in the adults, and this divergence, which is due solely to age, cannot be regarded as a specific character. The Hoindagi example, from the dimensions recorded, would appear to have been an outsize specimen of *Osteolaemus*.

With particular reference to the suggestion that the Semliki Falls "have prevented the upward migration" of crocodiles from Lake Albert to Lake Edward, I have been informed by two Conservators of the Parc National

Albert, one of whom had formerly been an Administrative Officer in the Semliki region, with a knowledge of the locality under discussion over a total period of forty years, that crocodiles (*Crocodilus niloticus*) had occasionally been reported from that part of the Semliki river in the vicinity of the Beni–Kasindi road crossing. Moreover, one of my informants recollected an African being taken by a crocodile close to where the ferry now operates.

In the arid areas of north-eastern Uganda, where the rivers are seasonally dry for about six months each year, there is another pigmy crocodile, which science refuses to recognize except as a variant of *Crocodilus niloticus*, the dwarfing being due to environment. It is well known that the crocodile is peculiarly adaptable to local conditions and, when young, is capable of suiting itself to its environment, i.e. when it is small it will grow no larger than is convenient in a restricted water-space. I can see no reason why dwarfing, which originated as an abnormality from environment and hard living, should not become a permanent character resulting in a new species, or at least a new race. It is scarcely a case of evolution, but rather one of degradation.

These miniature crocodiles are exceedingly wary, and, although I have seen many, they are so hard to bring to bag that I have never been able to secure a specimen. Examples of 4–5 ft., which I have carefully examined through glasses, have been really old creatures. They have a reputation for ferocity and, while not normally attacking human beings, are said to be particularly destructive to goats.

It is indeed curious that as their river haunts run low these crocodiles prefer to remain in the ever-dwindling pools rather than move to the security of easily accessible perennial waters. When the pools are completely dry the creatures estivate for several months in holes dug in the river banks. These refuges must be cleverly concealed to ensure survival, as the prowling savage makes short work of the inmates if he is lucky enough to find them.

The breeding habits are those of the Nile crocodile, the eggs being deposited in a hole in humid, sandy soil and hatched out, after an incubation period of many weeks, by the warmth of the sun. The incubation period of the Nile crocodile is 90 days, though in the case of its pigmy relative it may not be as long. It is strange that the pigmy's breeding season is during December to March, as the young crocodiles must hatch at a time when the pools are steadily drying and their chances of survival could not be worse. It is, however, in keeping with the breeding season of *Crocodilus niloticus*.

My principal claim for specific or at least sub-specific rank for this 'pigmy' crocodile is the fact that it lays a conspicuously dwarfed egg. Two which were measured were only $69{\cdot}0 \times 40{\cdot}2$ millimetres and $67{\cdot}2 \times 40{\cdot}3$ millimetres, which contrasts remarkably with 80×49 millimetres, the average egg size of the Nile crocodile. Not only this, but the one 'sitting' of this pigmy crocodile's eggs so far obtained consisted of 12 eggs as compared with the Nile crocodile's average of 60. This, however, can scarcely be regarded as conclusive, as the extent of reproduction in the animal world can be influenced by certain factors, of which the availability of the necessary food supply is one of the most important.

In April 1949, when the writer was on tour in Aringa County, in West

Nile District, a dwarfed crocodile (*C. niloticus*) was speared in a small pool in the bed of the River Ketchi which was then mainly dry. It was a small creature, barely three feet in length, which seemed to be considerably older than its small size indicated.

A question which can I think properly be asked is this: If the 'pigmy' crocodile were transferred to the conditions of a large lake, would it gradually attain the dimensions of a normal Nile crocodile? If the answer is in the affirmative then I would further ask: Could such a crocodile lay eggs of normal size? This, I believe, is the crucial test, for if normal eggs are possible then I have no more to say; but if, as I am confident is the case, it would take generations for them to revert to the normal egg, if at all, it seems that the claim of the 'pigmy' crocodile to definite recognition is established.

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