

OBSERVATIONS ON TERRITORIALITY IN *ALLIGATOR MISSISSIPPIENSIS*, THE AMERICAN ALLIGATOR, AND OTHER POINTS CONCERNING ITS HABITS AND CONSERVATION

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ABSTRACT Reasons are given for believing that charging alligators are serious, especially at their nests and in group defense of the young, rather than going through a "ritualized bluff." Observations are presented describing the actions of competing alligators and the establishment of territories between them in Mississippi brackish waters. Recent history has shown that alligators can live in natural streams and habitats close to human habitation, if they are not molested. The writer suggests that they should be removed from such environments when they attain a length of nine to ten feet because at that size they become dangerous. If man exterminates himself the various crocodilian species may survive for another quarter of a billion years as their ancestors have in the past.

In the early 1920's when Percy Viosca (1925) was prowling in a Louisiana swamp one night catching frogs with a carbide light, he was so threatened by a huge alligator that by his own admission he was temporarily scared out of his wits. In view of some questions raised about alligator behavior by Viosca and by others since that time, his account is worth further discussion even at this late date.

In spite of his cavalier manner of pointing at an unlabeled specimen in a bottle and saying thirty years later, for instance, I caught that snake on the Robeline road five miles west of Natchitoches on July 3, 1931, Viosca was widely recognized as a most careful field herpetologist (cf. Neill 1970, p. 65).

In the encounter described he established the fact that he was dealing with a very large and very shy and furtive alligator which apparently practiced complete avoidance of man when possible. Nevertheless, this beast (or another one exactly like it) charged from about 10 yards when Viosca scooped up two baby alligators about one foot long, and they gave the distress noise which he described as a grunt, "umph, umph." He thought this call was answered by the large animal before it charged, but he was not sure because of the subsequent excitement. He ran several yards through the foot-and-a-half deep water, fell over a cypress knee and doused his light. The charging animal did not attack in the dark and he told me many years later, "I never knew why that alligator did not grab me when I fell down." But there could be several reasons. In the first place the alligator may not have realized it was charging a man until it ran out into the light as Viosca (1925) suggested. Secondly, he threw the little alligators "right in the face" of the charger. No doubt the distress noises then ceased and a powerful stimulus stopped. At almost the same moment complete darkness supervened and the interloper suddenly disappeared from the alligator's view. This was enough to bemuse a reptilian brain and cause it to cease what it was doing without

supposing something like the ending of a "ritualized bluff."

Apparently, the idea of a "ritualized bluff" arose because of the habits of alligator females of chasing molesters only a short distance away from a nest. The full length of such a run to the longest distance recorded in the literature is about 40 yards (see Kushlan 1973). There are good reasons for short runs. In the first place the alligator is not built to run a mile. Secondly if one left a nest for long, a second egg stealer might come along. Thus a short run is in the best interest of nest protection.

The Everglades Seminoles are said to have a rule that if an alligator is moving, stay out of the way. Several accounts of alligator attacks resulting in serious injury and a few deaths of people have been recorded in recent years (cf. Neill 1970). These all involved hungry animals so far as is known. Anyway it is well known that alligators will bite. To assume that a charging alligator will not bite because it is only bluffing when guarding a nest seems to me, highly dubious. Much more likely such animals are not known to attack successfully only because they have not been known to catch their men, or in one sense their integrity has never been questioned.

Viosca said that he was puzzled because there is no real evidence of parental care after the young leave the nest. But the later observations of Joanen (1969) and Kushlan (1973) are good evidence of parental care in the alligator, and since these words were written Hunt (1977) has described the general response of older Morelet's crocodiles to mistreatment of young by other individuals in experimentally staged situations. There is a growing body of evidence that diverse crocodilians watch out for the young as a group, not just as parents. Furthermore, in some species mothers help the young out of the nest and carry them to water when they hatch, see Hunt (1977) for a literature summary.

Viosca's whole episode could have taken place on the basis of general reaction to a distress noise. Neill (1971)

described the use of the distress signal in various crocodilian species. It has been observed here at least once. One of our staff members once fished while standing in one of the ponds on Horn Island where he hooked a small alligator which came to the top. It made a strange noise which was described as a buzzing sound, whereupon alligator heads began to pop up all over the pond and converge on the area. The fisherman cut his line and got out of the pond. This is interesting because several alligators were not a parent and this indicates group care and protection.

Alligators have lived under essentially three regimes during the past 485 years, so far as their relations to man go. Before the European came, the Indian tolerated the alligator and in general left it alone largely because it was considered to be harmless and relatively valueless. A few were killed occasionally for their teeth and for the flesh, which is quite edible. There was no strong interest shown in their hides. Thus Le Page du Pratz (1758) tells the story of an amused Indian woman in Louisiana who taught a frightened Frenchman to chase an alligator out of his camp with a fallen tree limb.

The live-and-let-live relationships of the alligator and man changed to what may be called the persecution stage, during which the alligator was killed for its hide or wantonly shot and killed for the mere love of killing. That process has gone on for four hundred years at least as the European and his society took over the country.

During the zenith of the persecution stage, when I was a boy, I saw my uncle shoot a small alligator out in the middle of the Salt Works on Saline Creek near Goldonna, Louisiana, it being the only one that had been seen in that area for several years. One would think a dragon had come into the country. Some years later in the early 1940's once I accompanied a group of game wardens of the old Texas Game, Fish and Oyster Commission as they went killing alligators for fun on the bayous of the Texas Coast. Carcasses were not saved.

During this period the alligator has been taught its place, so to speak. It is now mostly a furtive hunted creature, apparently recognizing quite well that man will kill it almost every time it shows itself. Neill (1971) commented on how quickly a population becomes wild when a few are killed.

Before this age of persecution it can be assumed that these animals were bolder. My grandfather, James M. Pennington, once killed a large alligator by shooting it in the mouth as it charged him across a small creek in Louisiana well over a hundred years ago. He was not the aggressor. For this reason it never crossed my mind to doubt William Bartram's (1791) story of his boat being chased by alligators in Florida. Bartram was a Quaker who quaked at few perils, so far as the record goes, and if he stated clearly that he was chased by alligators, I am inclined to believe him, although Neill (1971) calls this part of a "farrago" of dubietys.

Strangely enough later in his book Neill seems to accept the attack on Bartram as being true. Alligators grew much larger in those days and one seventeen feet long would have weighed around 1400 pounds. They were the largest thing in the woods, except when the buffalo wandered through, and one might say they were accustomed to chasing whatever they pleased.

In 1964 at a meeting of the American Society of Ichthyologists and Herpetologists in North Carolina I heard Dr. Francis Harper commend the "civilized and progressive" states of Alabama and Mississippi for their laws protecting alligators. Today everybody including the federal government has followed Mississippi and Alabama and today we have protective laws for the alligator.

Alligators have been present in and around this Laboratory to my knowledge since 1955, and presumably for eons before. They are in the completely wild condition except that they are not persecuted and occasionally they are fed fishes by students returning from field trips.

When fish are thrown to them they do not jump forward in the water, and apparently cannot do so, but they lash out quickly from the side and grab with the mouth while simultaneously arching the tail around on the same side.

Alligators that are at the surface often miss fish that are thrown to them. These may sink within a few inches of their snouts or eyes with the alligator unaware and acting stupid. On the other hand they strike at floating fish quite adeptly. Evidently the surfaced animals with eyes out of the water, in the typical alligator floating stance, can see in the air only and not below the water, nor do they bob their heads up and down to facilitate such vision. Their habit when at the surface is to concentrate on what is visually possible to them above the water and on shore; they lie there unmoving and apparently no more noticed or noticeable than a small log by the ordinary denizen of the bayous.

Usually the alligator is the largest animal in his environment, but not always. No doubt the alligator gar, *Lepisosteus spatula*, can make away with small alligators but these gars apparently are not greater in size than a little over five feet on the Gulf Coast, none equaling the 9'8 1/2" specimen listed and figured by Gudger (1942) in fresh water. At least that has been my observation in the past 47 years. Lastly there are the snapping and alligator snapping turtles which can take any alligator that does not outweigh them, in my opinion. The largest we have seen on the Gulf Coast was a snapping turtle (*Chelydra serpentina*) almost two feet long, which was dug up alive, buried about two feet deep in the bottom of an artificial fish pond on the Laboratory grounds following the fearsome hurricane Camille of August 18, 1969. Apparently it was aestivating through the summer.

But there remain the alligators themselves. According to Neill (1971) they do not fight much in the wild, but this is not an absolute dictum and he gives a picture of two animals killing a third.

The main boat slip of this Laboratory is a dug channel where a former stream ran down some 160 yards to meet Halstead Bayou. It is 17 yards wide. The water is brackish and supports oysters and barnacles much of the time. This slip was the home of one of the local alligators for some three years and it had grown to a size close to six feet in length. Then one day another animal about half that length showed up at the head or inner part of the slip. This apparently infuriated Albert, as our resident alligator was named. There was no surface action, but I saw Albert go under water some 30 yards away while the smaller animal lolled at the surface as if it had not a care in the world. I tensed up and said to myself, "You fool, don't you know he is coming after you," when it gave a swirl and disappeared under the water. A little later, to my relief, it appeared some 30 or 40 yards downstream, while Albert came up at the head of the slip and obviously was looking around. The same tactic was used a second time, but the smaller alligator came back to the head of the slip where it was "cornered," so to speak, but it did not seem to mind. On the third repetition of these tactics both animals disappeared and stayed under longer than my patience lasted and so I went away. The upshot was that within the next two days the smaller alligator moved down near the mouth of the slip and took up residence close to the bayou, while Albert remained at the head of the slip, which seemed to be the poorer location, and there was no more chasing.

From this I concluded that the smaller alligator was able to take evasive action under the water to avoid the larger one and was confident that it could do so. Anyway, it showed no fear of an animal that outweighed it about seven times. I do not know what this evasive action is but I do not see how it could be faster swimming speed. Secondly, it would seem that the alligator at the surface senses in some manner when another one approaches through the water below.

I took these observations also as evidence of "territoriality" in the American Alligator, a common affair in many organisms, and did not realize that the situation was unknown until I read Neill's (1971, p. 61) statement, "...; indeed, the existence of territoriality has never been demonstrated for any crocodilian...". Therefore, I resurrected the observations and present them for the first time.

Large alligators do not grow in great numbers nowadays. Barbour's (1933) figures show, by extrapolating from a skull, that the largest modern American Alligator he had a record of was 17.5 feet long. He saw this animal when he was a boy. Neill (1971) mentioned one said to be 19 feet long. The largest recent specimen from this coast was caught inadvertently in Bayou Bernard in a trammel net by staff members of this Laboratory on September 21, 1967. The animal drowned. The measured length was 9 feet and the weight was 214 pounds. The mounted specimen now rests in the University of Alabama Zoological Museum. Larger specimens have been seen near the Laboratory in Davis Bayou but none have been taken.

The future of the alligator can be considered in two aspects, the first one being the temporary or present preservation of the species. The recent experience in Louisiana, Mississippi, Alabama and Florida indicates that mankind can live around and with a population of alligators in nearby waters. On the other hand it is probably not feasible to allow animals in such populations to grow to large sizes and certainly not to the limits known to Barbour (1933) and Neill. These animals would weigh up to 1500 pounds and they are simply too dangerous to be maintained where man comes and goes. Thus these animals should be eliminated after they get to be about ten feet long, which is still a very large animal for man to encounter in the water in case of an attack. Either that or they must be removed to the most remote swamps where man goes at his risk.

And so the alligator seems to have lived through to a period of peace and it may live on a few hundred years before it becomes extinct. W. T. Neill seems to think an early demise is inevitable for all crocodilians, but this may not come to pass if in the meantime man exterminates himself. In that case these reptiles may make it through to the millenium and live on for another quarter of a billion years when no man exists. In that case they will owe to man their long peace, when no vast technological civilization arises to endanger them again, because man will have used up the easily available materials (metals and fossil fuels) which it takes to begin such developments. In brief, both man and the crocodilians are in last chance positions with regard to survival on the Earth. Man can change his fate, but the crocodilians are helpless.

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