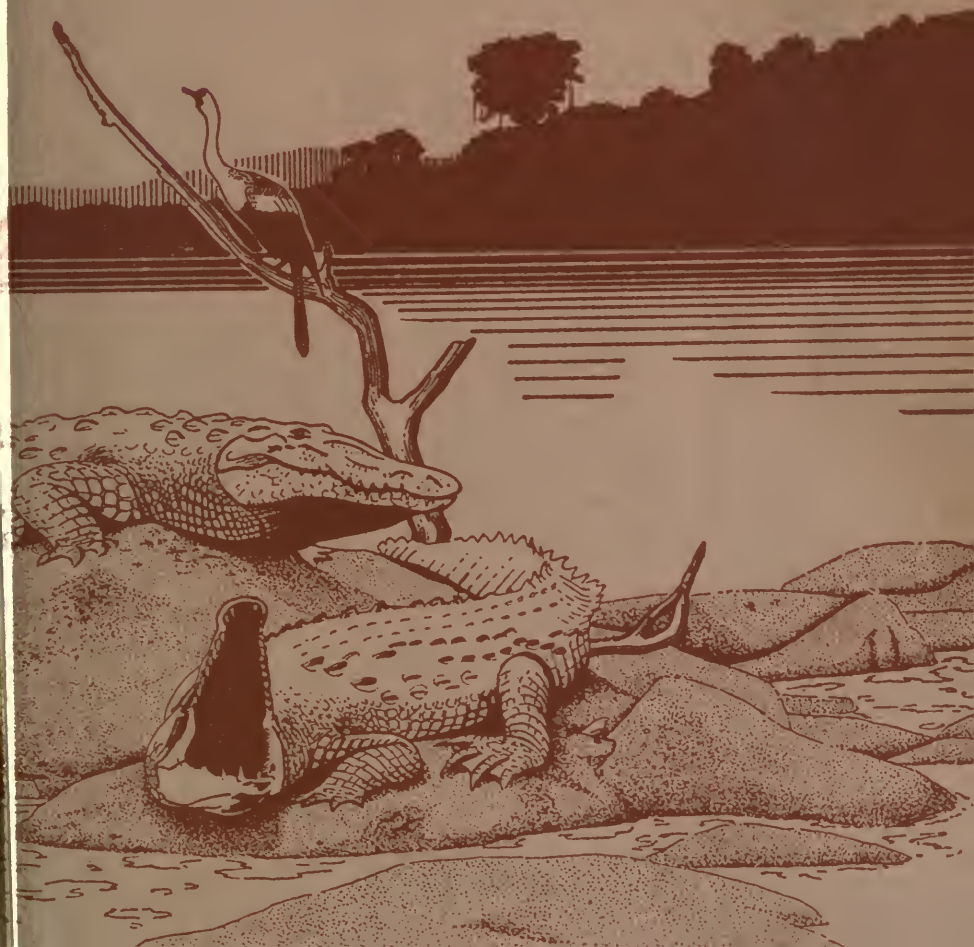


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Crocodile Hunting In Central America



Crocodile-Hunting
in
Central America

BY

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Crocodile-Hunting in Central America

In 1922, I came to Chicago Natural History Museum (then Field Museum of Natural History) to take charge of a newly organized Division of Reptiles and Amphibians. There were only about four thousand scientific specimens for the new division to take over, and the exhibition material consisted mostly of mounted skins of lizards and snakes and turtles, with a large stuffed alligator and a gaval to represent the crocodilians. All these were from the original collection at the World's Columbian Exposition, a part of the Ward Collection that formed the nucleus of the Museum's zoological exhibits.

We needed exhibition material and specimens to build up study collections. I was fortunate in having as assistant Mr. Leon L. Walters, already with long service in the Museum, and we wished to apply his already perfected "celluloid technique" in the preparation of our future exhibition specimens. My previous studies had been in the West Indies, and I turned eagerly to the richer reptilian life of Central America for our first expedition. Thus it was that Mr. Walters and I spent four months in British Honduras and Honduras in 1923. Our crocodile collecting, which was in the interest of both science and exhibition, afforded the highlights of a rich experience in a tropical world new to both of us.

THE BELIZE CROCODILE: Rediscovery of a "Lost Species"

We failed to find the common and widespread American crocodile in British Honduras in a situation suitable for the habitat group we envisaged for the Museum, but our hunting trips in the swamps behind Belize were rewarded by the re-

discovery of a distinct species of crocodile, described from this region seventy years before from the collections of the French traveller, Morelet. It had been so long uncollected that its very existence was beginning to be doubted in scientific circles. Morelet's crocodile—or the Belize crocodile, as we prefer to call it—readily distinguishable by its dark brown color and short, wide snout, proved to be abundant at Belize, and we obtained numerous juvenile specimens by “shining their eyes” at night as they lay at the surface of the swamp. The great majority of specimens were less than two feet in length, and we wanted to secure an adult, to confirm the differences between this form and its better-known relative.

The swamps behind Belize are intersected by the well-banked road that leads from the town to the interior of the country. We started down this road one night for a visit to the swamp, armed with collecting pistol and shotgun and provided with the headlights that enable one to discover animals by the reflection from their eyes. Some distance beyond the last cattle sheds, at a place where the swamp was rather open, merging into a cattail marsh, I saw the eye of what appeared to be a large crocodile some twenty yards from the road. I fired at this with the .22 caliber long-barrelled pistol, apparently without effect, though the eye disappeared a few moments later. Deciding to make a closer investigation, I waded out into the knee-deep water, locating the position where the eye was last seen by its proximity to a clump of bushes. On arriving at this spot, I could see clearly outlined, and not two feet from me, what seemed to be an eight-foot crocodile, lying motionless on the bottom. I moved slowly to one side, trying for a more favorable shot at his head, but did not allow sufficiently for the depth of the water, so that the .22 ball struck the crocodile on the corner of the skull instead of in the ear as intended. The shock of the ball, which glanced off, had a peculiar effect on him. He came to the surface and dashed madly about in a short figure-eight path, with jaws wide open, and came to a stop just in front of me, still with jaws open. Fearing that we would



FINISHED MODEL OF THE BELIZE CROCODILE.

lose the only good-sized crocodile we had seen, I made a despairing grab for his eyes with thumb and finger. This proved to be a decidedly effective hold, for I had no difficulty in carrying him ashore. Changing my hold to the front of his jaws almost proved disastrous, for although it was easy to hold the jaws shut, he was able to twist over and over with astonishing rapidity, necessitating equally rapid changes of hands on his snout to avoid laceration by the sharp projecting teeth. Mr. Walters, meanwhile, had joined me, and our combined efforts made the complete subjection of our crocodile easy. With jaws tied shut and both pairs of legs tied over his back (by means of our leather shoe strings) he could still roll over and over, and it was necessary to tie him to a convenient fence rail with our belts. It was somewhat disappointing to find that the actual length of the crocodile, five feet and three inches, was much less than my first impression had led me to expect.

Our further experience with a smaller specimen (just under four feet), shot by Mr. Walters shortly after, made the bare-handed capture of even small crocodiles seem rather foolhardy. The specimen shot by him was wounded and hid in shallow muddy water. When Mr. Walters touched its back, he narrowly escaped being bitten, and subsequent prodding with the gun stock, which was struck at by the crocodile with

an almost snake-like violence, proved that a specimen of this size could be a decidedly dangerous customer.

Our specimen was converted into a skin, skeleton, and plaster mold in our Belize backyard. It was especially fortunate that we could solve the problems of posing the animal and of making plaster molds with a medium-sized individual before attempting the much larger specimens of the American crocodile that we desired for a habitat group. Our mold was later converted into the handsome model of the Belize crocodile, now on display in the Museum.

THE HABITAT GROUP

The method of portraying animals and something of their life by means of the habitat group has proved to be one of the most successful and pleasing developments of the modern museum of natural history. The "habitat" of an animal is the sum total of its natural surroundings. In the "habitat group" a series of individuals of both sexes, with young, with enemies or prey, or with other animals characteristically associated with the species, may be represented in their natural environment by means of a painted landscape in the background and reproductions of vegetation and terrain in the foreground. Such representations of an animal, or of an association of animals, and of a natural environment, combine great artistic with educational and scientific merit. The vast importance of the environmental relations of animals and plants is reflected in the rise of a whole new department of biology—the science of ecology—for the study of the interaction of animals with plants and of both with the physical environment.

To be a faithful portrayal of natural conditions, a museum group of this sort requires first-hand studies of terrain, vegetation, and landscape. Against this background or setting of natural environment the animals must be placed in attitudes and groupings that display the species to advantage and are characteristic of it. These, even more than the details of the environment, require that the artist-taxidermist have an

authentic knowledge of the habits and appearance of his animal subjects. There could be no better example of productivity in this field of taxidermy as a result of first hand studies and collections made by the artist himself than the great series of habitat groups of African mammals in Chicago Natural History Museum, most of which resulted from the first African expeditions of Carl E. Akeley. These were at once acclaimed as setting a new artistic standard for taxidermy and as opening a new and extremely important chapter in the history of museum exhibition.

Something of the history of museum groups and of the rebirth of taxidermy as an art is told by Frederick A. Lucas in *The Story of Museum Groups*, and a vivid account of Akeley's own share in this development is contained in his book *In Brightest Africa*.

PROBLEMS OF MUSEUM EXHIBITION OF REPTILES

While the problems of museum technique in mounting mammals and birds for exhibition had been largely solved in the early years of the present century, museum representations of amphibians and reptiles remained highly unsatisfactory. Mounted skins of these creatures become entirely inadequate as representations of the animal's appearance in life, because of the curling of scales, complete loss of color, and general deterioration of the skin. These difficulties had gradually led, in the larger museums, to the use of plaster or wax casts, made in molds from the freshly killed and posed animal. This method was not wholly successful, for wax and plaster molds, aside from fragility, must be painted, and the paint tends to obscure the outlines of the scales or the more minute detail of the skin, and in addition the paint is of necessity opaque, while reptilian scales and amphibian skin are deeply translucent in life. The scale detail and the translucence of living reptiles is therefore unattainable in wax or plaster casts. These deficiencies of wax and plaster were so keenly felt that by the nineteen-twenties a number of attempts were being made to

revive the use of mounted skins, mounting them over manikins by the same methods used for mammals.

Faced with this dilemma in preparing models of amphibians and reptiles in Chicago Natural History Museum, Mr. Leon L. Walters, of the Museum's Taxidermy Staff, after first clearly defining the problem, discovered a simple principle that combines the natural skin or scale detail with the proper degree of translucence in such museum models. Using the customary plaster mold, made from a properly posed, freshly killed animal, he paints the "cast" directly on the inner surface of this mold with pigments suspended in a thick solution of celluloid-like material, such as cellulose nitrate or cellulose acetate in a suitable solvent. When this film of celluloid and pigment dries, the pigment is distributed through a considerable layer of the translucent medium. The exactness with which the degree of translucence in life can be represented in models made in this way must be seen to be appreciated. Since the cast, by this method, is painted directly onto the surface of the original mold, all of the surface detail present in the negative is preserved in the finished positive. The double problem of obtaining translucence and retaining scale detail is thus effectively solved. Mr. Walters has given a technical account of his process in a publication entitled *New Uses of Celluloid and Similar Material in Taxidermy*. Such cellulose-nitrate or cellulose-acetate casts, furthermore, avoid the fragility of wax and plaster, are washable, and with the admixture of their mineral pigments are not inflammable or subject to deterioration in hot weather.

Thus we were armed with what was at the time a new technique, the best available for the exhibition of reptiles. For a first and somewhat experimental group we thought of the largest of American reptiles, the American crocodile, and had set forth with plaster-of-paris as our principal equipment.

THE AMERICAN CROCODILE

The common American crocodile, a much more widespread form than the Belize species, is found in the southern tip of

Florida, in Cuba, and in Central America. We did not meet this species in British Honduras (where it occurs along the coast), but, during subsequent field work in northern Honduras, we were fortunate in finding a locality where it was abundant. This was east of the city of San Pedro Sula, at Lake Ticamaya, one of a chain of shallow lakes between the Chamelecon and Ulua rivers. Some of these lakes have been converted almost completely into marsh by the invasion of cattail. The presence of the lakes on the low ridge dividing the two large rivers offers a puzzling physiographic problem.

A LAKE OF CROCODILES

Lake Ticamaya is a picturesque body of water about a mile wide, its shore line broken by deep bays and its surface by numerous islets, some of which are reefs of bare rock. The water is shallow, no more than four or five feet at the greatest depth, and the bays are frequently invaded by a dense growth of cattail, while other shores are muddy or sandy.

The water of the lake is so filled with microscopic plant life that it has very nearly the color and consistency of pea-soup. The extremely soft mud of the bottom, probably formed by this plant growth, gives off marsh gas that rises to the surface and forms a bubbly scum. This scum accumulates in the sheltered bays, and, as it dries, assumes varied colors—yellows, greens, pinks and browns—often in regular bands parallel to the shore.

The wealth of bird life was a notable feature of the shores of our crocodile lake. Egrets and herons and rails stalked the edge of the water; brightly colored jacanas ran over the surface of the hardened scum near the shore; flocks of boat-billed herons and tree ducks sat in the moss-draped trees; and flocks of cormorants and snake birds fished in the shallow waters.

Crocodiles were extremely numerous in Lake Ticamaya, though very shy. With a field glass, Mr. Walters was able to count seventy-five heads of crocodiles in sight at once, in a single bay. At night, on almost any sector of the shore, from thirty to thirty-five eyes could be distinguished within



range of a headlight. In marked contrast to the situation at Belize, there were no specimens under three feet in length. At any rate, none were found or seen with the light. Nor was there a great number of very large specimens, though we had no difficulty in securing four that exceeded ten feet in length. Our largest specimen measured eleven feet two inches.

At mid-day numerous crocodiles hauled out on the sloping shores to lie in the sun. After the manner of crocodiles in other parts of the world, this species frequently suns itself for hours on end with mouth wide open. The most probable explanation of this curious habit is that the leeches frequently found in the crocodile's mouth are thus dried out. Another attitude frequently observed was the raising of the body into a startlingly dinosaur-like pose when an undisturbed crocodile got up to return to the water. In this pose the crocodile seemed to be raised almost on the toes of his hind limbs, in a kind of after-siesta stretch.

The food supply of the smaller crocodiles was provided by the small fishes with which the lake abounds. Large speci-



THE SHORES OF LAKE
TICAMAYA, HONDURAS.
PATHS IN THE MUD
HAVE BEEN MADE BY
CROCODILES.

mens, in addition to being notably cannibalistic, had remains of turtles, peccaries, and deer in their stomachs.

We were fortunate in finding a crocodile's nest on a sandy beach, a dozen feet from the water and dug about a foot deep in the sand. This nest showed that the American crocodile does not construct a nest of decomposing vegetable matter, the material used by the American alligator and some other crocodiles and caymans. The twenty-two eggs were of about the size of a goose egg, white, and with a porcelain-like shell. They afforded a welcome change from our menu of rice and beans.

HARPOONING CROCODILES

The singular conditions at Lake Ticamaya, so evidently favorable to crocodilian life, determine the method of hunting them in use by the native Caribs. The ooze of the bottom gives off marsh gas at the slightest touch, and a slowly moving submerged crocodile can be followed by means of the tracks of persistent bubbles that register every footprint of the hind



GROUP OF THE AMERICAN CROCODILE, SHOWN SUN
Celluloid models of crocodiles and accessories B



N A ROCKY REEF IN LAKE TICAMAYA, HONDURAS.

Walters; background by Arthur L. Rueckert.

feet on the surface above him. When frightened, he darts off at high speed, and this remarkable kind of track changes to a shooting trail of bubbles. A fair estimate of the size of the crocodile can be made from the breadth of the bubble trail. With this means of following specimens, it is possible to capture them by harpooning. One of the Caribs living near the lake enjoyed a considerable reputation as a crocodile hunter and, in fact, appeared to be the only person in the whole San Pedro valley who had any skill or experience in harpooning. We employed him to collect our first crocodiles, but we soon learned that we ourselves could do nearly as well.

Provided with harpoon, .22 pistol, .30 calibre Winchester, and single paddles, we set out in a dugout canoe as early as possible in the morning. By eleven o'clock in the forenoon, the wind has risen and makes it difficult to follow the trails, as well as to manage the canoe with the harpooner standing in front, for the round-bottomed native dugouts are by no means easy to handle at best. Arriving at an upper bay, we had no difficulty in finding a fresh crocodile trail. As soon as the crocodile finds that he is being pursued, it requires the attention of both paddler and harpooner to keep to the trail, for the hunted crocodile doubles and turns, and the paddles leave swirls of bubbles in which his trail is indistinguishable. When the crocodile takes a straight course, the harpooner tries to judge his position under water and makes a trial cast of the harpoon, usually with no other effect than to make him turn off or double back on his track. Even a direct hit may fail to take effect if the harpoon strikes the head or one of the bony plates of the back. After a few minutes of pursuit, the crocodile attempts to hide by coming to a stop on the bottom. This offers his best chance of escape, for if he persists in sulking and does not happen to be located promptly, it is soon impossible to find him at all. We, therefore, strike into the water with harpoon shaft and paddle, prodding the bottom and making as much noise as possible. There is some danger of an upset at this stage, for when the crocodile is struck or frightened, he creates a violent com-



THE HARPOON HAS JUST BEEN CAST.



THE HARPOONED CROCODILE TOWING THE CANOE.

motion in starting out. In fifteen or twenty minutes he is compelled to come to the surface for air, but exposes only the tip of his nose. At some stage of the pursuit, he nearly always begins to circle, gradually narrowing the diameter of his course as he is followed, until he is turning almost in his own length, whereupon he comes to a stop on the bottom and must be started again by prodding. If, however, he is persistently followed, in a few minutes more he will come to the surface and swim with his head out, apparently giving up the underwater tactics. When this occurs, it is of course only a matter of a few minutes until the harpoon is fast in his back. At this, he submerges again and the harpooner recovers the harpoon shaft and then hastens to pay out rope, as it is dangerous to tempt a large crocodile by remaining too close to him while pulling on the rope.

Landing the crocodile is still a matter of some difficulty. Specimens more than ten feet in length can not be towed with the canoe. One of us, therefore, stripped and waded in the breast-deep water, hauling steadily on the long rope. With a hundred feet of rope, even the largest specimens are rather easily managed in this way. The unfortunate beast makes a few struggles and rushes about at the surface of the water with open jaws, but it is surprising that so powerful an animal makes so little effectual resistance. It is important to choose a rocky shore on which to beach the crocodile as he may otherwise become deeply buried in the mud.

Once hauled out, a large crocodile is a savage customer, snapping viciously at his captors and at the rope. The largest specimen that we secured alone, snapped at the bullet that killed him, the jaws making a report very much like that of a .22 rifle. Our first specimens were shot in the water with the Winchester, but we presently found that it was quite simple to maneuver into position and dispatch the beast by shooting vertically into the neck, at the base of the skull, with the .22 barrel of the "Game Getter" pistol. This shot not only does not damage the skull but has the advantage of killing the animal outright.

OTHER METHODS OF HUNTING CROCODILES

In waters less favorable to crocodile-hunting than Lake Ticamaya, other methods must be used. Setting a baited



A CAPTURED CROCODILE.
Leon L. Walters and Carib Indians

line, and hunting from a blind with a tethered bait are well-known methods of hunting, especially for solitary individuals whose location is more or less permanent, but by far the most practicable method is night shooting. We spent several nights on the lake with carbide head-lights, rifle and harpoon. At night on Lake Ticamaya, with the headlight, one sees crocodile eyes on every hand. Their fiery red reflections may be seen from every angle, even from the rear. One very rarely sees both eyes, and for an estimate of the size of the animal it is usually necessary to depend upon the apparent size of the eye, which is not a very reliable guide. The hunter can usually approach closely enough, however, to see the outline of the head, though rarely near enough to use the harpoon, except on the smaller specimens. We secured several four-

and five-foot specimens alive in this way, but did not attempt to capture any large ones. We once had a narrow escape from upsetting the dugout when we ran full onto the back of a large crocodile, near shore, where he had submerged to evade our pursuit. In shooting, it is necessary that the animal be killed outright, and even then it may be difficult to locate the body, which usually appears at the surface only once and then sinks to the bottom.

MAKING THE MOLDS

The work of making plaster-of-paris molds of the larger crocodiles occupied much of the three weeks we spent at the



LEON L. WALTERS MAKING A PLASTER MOLD IN THE FIELD.

lake. The work was done under difficulties. The body of the freshly killed specimen (the largest weighed more than half a ton) had to be transported to the nearest beach that we could reach with our barrels of plaster. The posing of

our reptilian monsters was an important matter, since the positions chosen were necessarily final. The alga-filled water of the lake could not be used in mixing the plaster, and so we dug shallow wells, into which clear water filtered through the sandy mud.

We applied the plaster-of-paris in two layers, a thin inner one of smooth plaster followed immediately by a heavy outer one laid on with masses of tow soaked in plaster. Working together, at top speed, it took us until past midnight of the day on which our specimen was killed to complete the work for the body alone, and on the following morning there was a continued race between the application of the plaster and the advance of decomposition.

There was much other work to be done, both for the exhibition of crocodiles and for the scientific collection. Color notes taken with elaborate care were necessary to ensure the correct coloring of the final casts in the Museum. Skins had to be removed and preserved by salting to supply guides for the pattern, which preserves well in the dried skin in spite of changes in the colors themselves. Series of skulls were prepared for the study collection in the Museum. General collecting of amphibians and reptiles in the vicinity of Lake Ticamaya produced a remarkable new narrow-mouthed toad and a handsome new species of lizard, which I subsequently named for Mr. Walters. Preoccupied as we were with the crocodile work, we were unable to do more than touch upon the fascinating biological problems presented by the lake and its immediate region.

The packing of the large shells of plaster for transportation to Chicago was in itself a difficult problem. The largest pieces of mold were six feet in length. We purchased rough lumber at the mill in San Pedro, hauled it out by oxcart, and built three large packing boxes, each six and a half feet long, three and a half feet wide, and a foot and a half deep. Frames of straight green poles were fitted inside these boxes, and the molds were lashed inside the springy frames. This arrangement, devised largely by Mr. Walters, proved so

effective that the huge plaster shells of our four complete molds of crocodiles reached the Museum without damage.

DIFFICULTIES OF WORK IN THE TROPICS

With our best efforts, it took three and a half weeks to accomplish the field work for our crocodile group. There is little to fear in the tropics except the ever-present danger of tropical diseases, and especially insect-borne diseases, to which northerners seem especially subject. During our stay at Lake Ticamaya, toward the end of the dry season, the thermometer stood at 100° F. in the shade every day. We were fortunate to escape malaria, and apparently the hosts of ticks carried no disease, for if they had, we certainly would have been inoculated several times over. The greatest hardship was the bad drinking water, of which we came to have a real horror. The only water available was that of the lake itself, filtered through the mud of its shores into shallow holes dug at the sides. The water had a strong and very disagreeable flavor, which was not improved by the addition of a double dose of chlorine tablets. The intense heat and the necessity for continuous work on the molds made it necessary to drink great quantities of this water. The bad water, combined with the gruesome rapidity of decomposition in the crocodiles and the ominous presence of the hundreds of vultures that watched us, made us hasten to complete our work. It was a happy caravan of two oxcarts and two saddle mules that left Lake Ticamaya for the return to San Pedro and to Chicago.

WORK IN THE MUSEUM

The field studies, plaster molds, and specimens obtained in Honduras were, of course, the basis for the actual work in the Museum's work shops, where the exhibition models and the group accessories were made, the background painted, and the habitat group finally assembled (pp. 12, 13). Mr. Walters was engaged on the models and accessories for more than a year after our return.



THE PLASTER MOLD OF A FRESHLY KILLED CROCODILE. THE MOLDS WERE MADE ON THE BANKS OF A LAKE IN HONDURAS.



THE REPTILE HAS BEEN COMPLETED AND THE MOLD REASSEMBLED. THE PROCEDURE OF MANIKIN BUILDING AND REINFORCING HAS BEEN MUCH THE SAME AS WITH LARGE PACHYDERMS.



BREAKING AWAY THE MOLD DISCLOSES THE SPECIMEN COMPLETELY COLORED. NO COLOR IS PAINTED ON THE SURFACE.

The crocodiles in the group exhibit the most characteristic poses of the species observed in the field, including a specimen with open mouth and a juvenile specimen in the dinosaur-like pose assumed on rising to its feet after sunning.

The foreground is occupied by the "ground work" of the group, a reproduction of one of the rocky reefs on which the crocodiles haul out to lie in the sun. The rocks are made of plaster, which is painted to resemble the texture of the specimens brought from Honduras. Water is represented by glass on which the characteristic algal scum of the lake is reproduced in celluloid. A snake-bird perches on a near-by dead limb, and a jacana with its long toes supporting its weight on the floating scum may be seen at one side.

The background painting by the late Arthur G. Rueckert, based on our photographs and descriptions of Lake Ticamaya, exhibits a broad expanse of water, with the characteristic masses of bright-colored floating scum, framed against the background of the wooded shores with their dense mass of palms and hardwoods and with low mountains in the distance. Sunning crocodiles in characteristic poses are shown on the distant beach, and herons and egrets stalk the muddy shore as they did in life.

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