

NESTING OF THE PUERTO RICAN ORIOLE

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The Puerto Rican Oriole (*Icterus portoricensis* Bryant) is peculiar to the island of Puerto Rico. It is a common resident of the *finca* at Algarrobo, between Vega Baja and Manatí already described in my paper on Latimer's Vireo.

Song and call notes.—This species has a very pleasing song of distinctive oriole quality. It was rarely heard during the time included in these observations except at dawn, with a possible subdued repetition or two between daybreak and 7 A. M. The singing began at the first signs of light and lasted through the period of dusk. It ceased the instant that it was broad daylight. During the time that these observations were made, it began about 5 A. M. and ended about 5.25 A. M. The song was suggestive of the words, *Merry Chev—c'm out here*. Squeaking, liquid gurgling notes were thrown in to embellish the main theme. These were inaudible at any distance. They occurred on the word *here* as follows: 1. *Here* omitted entirely. 2. Pause between *out* and *here*. 3. Chucks, squeaks, clear whistles or additional syllables uttered between *out* and *here*. *Chevé* was the word audible at the greatest distance, and was the one most frequently employed in the daytime songs. These latter were of rather infrequent occurrence. They were often subdued and consisted of portions of the early-morning song, or of a variety of notes, sometimes not more than three, but recognizable by the quality of the tone.

Although the song was of such pleasing quality, the call note was hoarser than that of the *Mozambique* [*Holoquiscalus niger brachypterus* (Cassin),] and was very similar. It was a harsh *chuck*, and was quite constantly heard in the vicinity of the nest throughout the breeding season. Both male and female uttered these notes, but one much more frequently than the other and in a louder tone. That one I believe to have been the male, since he was the one on guard.

Nest.—Nests of two pairs of this species were located in 1931. The first, found on April 22 contained an incubating bird within 7 days of hatching; the second, seen on June 3 was occupied by 3 young. The first was in a young, low cocconut palm about a five minute walk from human habitation; the second was in a royal

palm, about 25 feet in height that was situated at the foot of an abruptly sloping hill, at the crest of which was a house.

Nests of these orioles are especially difficult to find, due to both the altitude at which they build and to the manner of placing their nests. They build beneath the long drooping leaves of palm trees. The nest is a rather flattened out affair, packed so closely against the mid-rib that it easily eludes detection. This was well illustrated by the nest in the cocoon palm. It was so well hidden that it barely escaped the *machete*. Some men had already slashed off two leaves on the tree, and were about to cut the third, when one of them saw the nest beneath the leaf, and fortunately withheld the knife. This was a particularly happy discovery since the tree was so young that it was only about 15 feet in height, and the leaf utilized by the pair was one of the lowest on the tree, making it ideal for observation. The leaf had a less acute upward slant than those above it, making the under side less exposed to view.

The nest was located under the mid-rib at the highest point of its curve, and was 12 feet from the ground. The mid-rib ran north and south. On the east side, the pinnae were long, closely set and quite even. On the west, they were more jagged, and near the stem were quite short. The nest was composed of long, thread-like fibers, evidently taken from both the tattered edges of palm leaves and the matting which encircles the stems. That was the only material employed with the exception of a makeshift lining of *Tillandsia* stems. The palm fibers were thickly matted and interwoven making a very durable nest, but inside there was a thin layer of slightly finer fibers that was not interwoven but that had been dropped in loosely and then shaped by the bird's body to form a shallow cup. It was 2½ inches deep and 4 inches in diameter at the rim. From it radiated 4 straps, composed of the same matted material as the nest. They ran parallel to each other, about 7 inches apart, two extending south from the nest, parallel to the mid-rib, and two north. The total length from the end of one strap to the end of the other, on the west side was 2 feet 4 inches. This included the nest. On the east side the total length of straps and nest was 2 feet 6½ inches. The number of pinnae covered on the west side was 20, and on the east side, 24. These straps were secured to each of the 20 and 24 pinnae by a thread of palm fiber looped through the edge of each pinna, and what is most remarkable, the looping unfaillingly occurred on the same side of the mid-rib of each pinna (the south). Not a single pinna was skipped the entire length of the straps. In width the

straps varied from $\frac{1}{2}$ inch to 1 inch. The place of attachment on the east side measured 5 inches from the mid-rib, and 4 inches from the mid-rib on the west side. The nest hung 3 inches below the mid-rib. At one place an extension of the nest rim occurred and was utilized by the pair as a landing place.

Eggs.—Three eggs composed the clutch. They were very pale blue (almost white). One egg was a shade bluer than the other. The third egg had already hatched. The spots on the two eggs varied. On one, the larger end was completely washed with pale rufous brown, extending almost to the center of the egg. The remainder was sparsely sprinkled with small spots of the same color. The larger end of the other egg was wreathed with heavy splashes of almost seal brown, while the rest of it was lightly sprinkled with some small and some larger spots of the same color. One egg measured $23\frac{1}{2}$ mm \times $17\frac{1}{2}$ mm; the other, 24 mm \times 17 mm.

Incubation.—This labor was performed by only one of the pair, presumably the female. The other did guard duty. Its special perch was about 60 feet from the nest and was a tall *icaco* sapling that arose from a dense group of the same species. It terminated in a dead twig. From that it had an extended view of the surrounding territory, which it scanned with an eagle eye. At the appearance of any disturbing element it would set up a nervous reiteration of the *chuck* note. It learned to recognize my approach when yet a long way off. Whenever I was forced into the open from lack of the protection of wayside brush, the bird would set up an irritating series of protesting *chucks*. Neither would it be fooled by any blind, but would vigorously attempt to force out the concealed intruder by rapid repetition of the same note, and also by flying close about the blind. However, in spite of these manifestations of displeasure, the normal activities at the nest were not often retarded. Sometimes the supposed used the guard tree as a stopping place, when en route to the nest. It was not an uncommon sight to see the pair perched there together.

When away from the nest the incubating bird was joined by its mate and both flew off together. A favorite feeding ground of the pair was a brushy tract, some distance from the nest, but their feeding territory seemed to have no well-defined boundary. Dead branches were favorite perches.

Both the approach and departure from the nest by the incubating oriole was accomplished very stealthily. The palm leaf concealed the bird so completely that many times it escaped unseen.

It evidently crept out of the nest between the pinnae or flew out between the shortest ones on the other side of the leaf from the observer. At other times it dropped down to within a foot or two of the ground, then dashed up and off.

One day, at 12.55, a subdued song was heard. It consisted of a few notes of the early morning song. That was the only song noted during incubating activities. The only other sound emitted was the *chuck* note. That was occasionally heard both when the supposed female left the nest and when she returned, as well as when she was on the nest. On April 24, from 10.25 A. M. to 1.03 P. M. that note was recorded 6 times.

Torrential showers of almost daily occurrence and the evasive escape of the female from the nest combined to so handicap observations that the length of only two incubating periods were positively secured. One was of 41 minutes duration; the other, 28 minutes.

Rearing of the Young.—One egg was found hatched on April 29, at 10:10 A. M. The young bird was not yet dry. An excessive, all-day rain prevented continued observations, so the exact time of the hatching of the other two eggs is not known. The young were first seen out of the shell April 30, at 9.26 A. M. The supposed male now assumed in addition to guard duty, that of assistant provider, while the supposed female acted as brooder and did her share of feeding the young. As far as the observer was able to ascertain the supposed male took no part in the brooding.

Brooding occurred most frequently on the first day, April 30. During 2 hours, 6 minutes spent at the nest in the morning, the bird brooded 4 times. The longest period was 20 minutes, the shortest 9 minutes. The longest period off the nest was 40 minutes; the shortest, 22 minutes, averaging a brooding every 31½ minutes. In the afternoon from 4 to 5.25, there were 3 broodings, one lasting 8 minutes, one 9 minutes, with the length of the last one which occurred at 5.25, undetermined. In the morning of the second day, during 3 hours 20 minutes spent in observation, brooding occurred 4 times, averaging one period every 50 minutes. The length of these periods in minutes was: 14, 11, 8, and 11, respectively. In the afternoon, during 2 hours, 15 minutes at the nest, only one brooding took place. It lasted 15 minutes. On the third day, only 2 broodings occurred, during 1 hour 52 minutes observation, an average of one every 56 minutes. There were no observations on the 4th day, and on the 5th day, only one brief period of 4 minutes was noted. No brooding occurred after the 5th day.

The average frequency of feeding during the first 5 days while brooding was in progress was about once every 15 minutes. On the 6th day, the frequency increased to an average of a feeding every $6\frac{3}{4}$ minutes in the morning and every $5\frac{1}{3}$ minutes in the afternoon. This average held practically the same through the 7th and 8th days. No observations were made on the 9th and 10th days. On the 11th day feedings took place every $7\frac{1}{2}$ minutes. No observations occurred on the 12th day. On the 13th day, the last the young were in the nest, feedings averaged every $8\frac{1}{2}$ minutes in the morning and every 4 minutes in the afternoon. Total average for the time observed was a feeding about every 6 minutes, after the 5th day. Twice on the second day, the supposed male was seen to carry insects to the brooding bird. That was the only time such behavior was noted.

The favorite alighting place of the pair when en route to the nest was the mid-rib of the palm leaf, under which the nest was swung. There they would sit, sometimes one alone, but many times both together, chucking, or drubbing insects, waiting until they considered it safe to approach the nest hidden below.

When feeding the young, the pair often clung to the side of the nest, with tail curved under it. They also fed from the rim. A favorite landing place was that part of the nest rim that was particularly wide. If any disturbance were heard outside while the birds were within, they had the habit of clinging to the base of the nest, head down, and peering in all directions before venturing forth. Exit was usually made by flight toward the stem end of the leaf, but sometimes from under the tip.

The pair showed greater annoyance at the presence of an observer than during incubation. Any attempt to approach the nest was provocative of rapid, excited chucks.

As during incubation, the guard tree was frequently occupied by the supposed male, especially while the female was brooding. At times he kept up a constant chucking; again, only an occasional note was heard. The *chuck* note was often uttered near the nest, both as a scold and warning note and as a conversational note. Sometimes it was loud and was uttered rapidly. At others it was casual and subdued. Both male and female emitted it, but the supposed female much less frequently than the male, and the tone was pitched lower and was softer. Both birds often chucked before going to the nest and immediately after leaving it.

Two long distance flights were noted. The first occurred at 2 o'clock on the 5th day. The pair flew from the guard tree, high above the tree tops, over the open country toward the west, and out of sight. After 5 minutes, one alighted on the mid-rib with an insect dangling from his bill. Only one bird went on the second flight. That took place on the 7th day. The bird was away 14 minutes.

Excrement sacs were evidently eaten during the early care of the young. It was not until the 13th day that they were noted being carried out of the nest by the parents. At 12.23, 3.07, 3.54, and 4.20 pellets were carried from the the nest in the bill.

As the time approached for the departure of the young from the nest, the pair became exceedingly nervous about my presence.

The departure of the young from the nest was unwitnessed. It occurred on the 13th day of May, 14 days after the hatching of the first egg. Four days later one of the parents was seen searching for insects followed by one young fledgling. The latter was constantly emitting a loud call note, *yeep yeep yeep*.

Young.—The general color of the freshly hatched young was reddish orange. The center of the belly was mouse gray encircled by adjoining areas of red, yellow, orange and brown; the mandibles were pale orange edged with ivory white; the legs were orange; the nails and tip of the upper mandible were ivory white.

The color of the ball of the eye was slate gray; the iris, orange and the pupil mouse gray.

Natal down was sparse and was distributed in rows. A row followed the contour of each eye, next to the center axis of the head, beginning at the nostrils and terminating at the crown; one also followed the contour of the shoulder, elbow and hip joints on the upper surface. The margin of the wing was edged with it. Two tufts of hairs occurred at the knee joint, on the tail and on the nape of the neck. A row extended along the spine from the rump, half way to the head. On the belly a row followed the contour of each hip joint. The color of the down was pale gray, except that on the belly knee and elbow joints, which was white.

On the 3rd day, the oldest nestling showed wing quills just pricking through. By the 4th day the two youngest had begun to develop them, also. Those on the oldest one were longer and the down on the spine was disappearing.

When the young left the nest on the 14th day, the plumage was noted as follows; head, very dark brown; back, a shade lighter than the head; rump and tail, brown; wings, slate gray, edged

with buff; breast, light buffy brown; belly bare; sides, ochre yellow; under tail coverts, light yellow; general appearance, dark brown or slaty on top and buffy beneath.

During the early part of their existence, the young made peeping sounds. This was first noted immediately after hatching, when one was in my hand. These sounds were inaudible on the first day from within the nest, but by the third day could be heard, if one were directly beneath it. By the 5th day they had increased in volume to such an extent that they were audible in the blind, several feet away. When the young heard their parents chucking on the mid-rib above them, they peeped lustily. By the 11th day they had developed a call note. It was emitted loudly and rapidly and was suggestive of the syllables, *ti ti tí, ti ti ti teé, tit ti ti teé*. When out of the nest the call note was a loud *yeeep*.

The Royal Palm Nest.—This nest, located on June 3, differed from that in the cocoanut palm, in that it had no radiating straps. It was attached to the leaf pinnae in only three places, with intervals of 4 pinnae and one pinna between attachments. It suggested a swinging basket. The heads of two young were visible above the rim. One of the parents was a bird in immature plumage. On June 9, one of the fledglings was found out of the nest in the bushes at the foot of the tree. On June 10, the remaining two young were still in the nest, but one had climbed out on the platform-like broadening of the nest rim between two of the attachments to the leaf. The other stood on the rim. The mature parent was seen to feed them, and was followed by the immature bird, which, after feeding carried out an excrement sac. During 42 minutes observation, the mature parent fed 4 times and removed excrement sacs twice. The immature bird fed once. However, the demands of the fledgling already out of the nest may account for the seeming neglect by the immature bird. At 9.40 one young was on the platform apparently eager to fly, but afraid. By 9.50, the other fledgling was standing on the nest rim. At 9.55, one climbed farther out over the rim, them clinging to the nest, turned around, with tail hanging down. That was enough of a venture for one time; both fledglings climbed back into the nest and settled down, out of sight. They were fed twice, first by the immature parent, then by the mature one. After the latter flew, he chucked 20 times in a minute.

At 3 P. M., on the same day, one of the parents was seen clinging to the very tip of the terminal shoot of the royal palm. One fledgling had vacated the nest altogether. The other was clinging

to the rim. One leg slipped; he drew it back as if afraid of falling, and climbed inside the nest, but was soon out again. This time he let go with his feet and tried his wings. He flew upward directly above the nest toward the mid-rib which was about 3 inches above him, then dropped back into the nest. Unfortunately, the final successful flight was unwitnessed, and was accomplished during a very few minutes absence from the nest. Upon return, the young were in the bushes at the foot of the palm, giving the *yeep yeep* call, and the parents were chucking nervously.

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