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NOTES ON THE RANGES AND BREEDING HABITS OF CERTAIN MEXICAN BIRDS

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From March 9 to June 4, 1947, the Lea-Edwards Expedition observed and collected birds in several parts of México. Activities centered in southwestern Chiapas (Hacienda Monserrate in the mountains of the district of Cintalapa), west-central Veracruz (Río Atoyac, near Paraje Nuevo), Michoacán (Lake Pátzcuaro and its basin), and southern Tamaulipas. Reports on the birds recorded in Chiapas and in Michoacán are to be published elsewhere. Specimens collected in Veracruz are in the Sutton collection, awaiting final identification. The following paper concerns only the final period, during which the expedition (joined for that period by Sutton) visited El Salto, San Luis Potosí (May 13 to 16); Pano Ayuctle (Pumpkin Ford), along the Río Sabinas near Gómez Farias, Tamaulipas (May 16 to June 2); the Mesa de Llera, Tamaulipas (June 2); and Linares, Nuevo León (June 2 to 4).

El Salto, San Luis Potosí has been mentioned only infrequently in scientific literature. It is a beautiful waterfall on the Río Naranjo, not far from the Tamaulipas border. It can be reached by turning north from México highway 170 at a point about 18 miles west of Antigua Morelos, Tamaulipas. The 8-mile stretch of unimproved road between the highway and the fall is said to be negotiable at all seasons. The river was low at the time of our visit, but a considerable volume of water plunged over the precipitous limestone cliff which we estimated to be 175 feet high. Immediately below the fall the river was, in effect, a series of intensely blue pools, over the level rims of which the water spilled. Some miles downstream another fall was audible, though not visible, from the road. Between the falls the riverbanks were low, for the most part, and lined with trees (among them gigantic cypresses and sycamores), shrubbery and vines. Below the lower fall there was a gorge. Although the countryside away from the river was semi-arid, certain areas supported palm groves. The broad valley a few miles below the fall was densely forested with palms.

The land above the upper fall (El Salto proper) was widely cultivated and surprisingly flat. Just before plunging over the cliff the river separated, almost deltawise, into several channels which meandered through a lush patch of forest. The cliffs about the fall fairly teemed with bird-life. Two Peregrines, *Falco peregrinus* Tunstall, apparently had an eyrie on a ledge above the falls. Flocks of Military Macaws, *Ara militaris* (Linnaeus), came and went, alighting frequently on great rocks which jutted from the fall itself or on a ledge not far from the falcons' eyrie. Mornings and evenings hundreds of Collared Swifts, *Streptoprocne zonaris* (Shaw), circled about. We were thrilled as we watched those which swooped into the yawning caverns back of the cataract.

The coastal plain and foothills of the Gómez Farías region of Tamaulipas have been described in detail by Sutton and Pettingill (1942) and Eaton and Edwards (1948). Our camp-site on the Río Sabinas was the same as that used by Eaton and Edwards in 1946. During our stay the weather was warm and bright for the most part, though there were occasional heavy showers, especially at night. We noted that clouds almost constantly covered the higher mountain slopes to the west, but these clouds did not actually envelop us. In this respect our experience differed from that of the Cornell University-Carleton College Expedition, which was based at the Rancho Rinconada, a few miles downstream from Pano Ayuctle, in the early spring of 1941.

The Mesa de Llera is about 35 miles south of the city of Victoria. From a walled-in lookout at its top (elevation about 1700 feet) near kilometer mark 656 (north from México, D.F.) on the Pan American highway, one can survey the vast, semi-arid, mesa-dotted plain stretching off to the east. The mesa-top is partly open grassland, partly brushland. In some of the denser thickets grows a scattering of wild pineapple (*Bromelia pinguin*), a plant which is luxuriant along the Río Sabinas. Great clumps of cactus are a feature of the Mesa's vegetation. During our brief visit on June 2 we found the nest and eggs of the White-bellied Wren, *Nannorchilus leucogaster* (Gould), a discovery which has been fully reported elsewhere (Sutton, 1948).

Linares, Nuevo León, is on the Pan American highway near the west edge of the flat, dry coastal plain. The Pablillo and Comacho Rivers provide water for the many citrus orchards of the vicinity. Along these streams some of the trees are large, but elsewhere the vegetation is xerophytic (see Sutton and Pettingill, 1943).

The following list is principally of species whose nesting habits are little known; but a few species are included because published statements concerning their breeding ranges are not quite accurate. All the specimens mentioned are in the Sutton collection.

1. **Heterocnus mexicanus** (Swainson). Mexican Tiger Bittern. A nest of the Tiger Bittern found by Lea along the Río Sabinas on May 1, 1941, was on an almost horizontal cypress branch about fifty feet above the water. Lea saw one adult bird on the nest and another as it flew to the nest. Pettingill photographed one of the adults as it walked along the branch toward the nest, which was apparently a broad platform of large dead sticks (see Sutton and Pettingill, 1942: 7).

We did not find a nest in 1947; but on May 25 Lea observed interesting courtship behavior. Hidden in shrubbery along the bank of the Sabinas, he watched one bird fly down the river followed presently by another. The latter alighted on a cypress branch not far above him, stood motionless for a time, then, with beak pointed straight up, slowly stretched its neck and body vertically, until the bright greenish yellow, featherless skin of its throat, and the bold barring of its neck plumage, were plainly visible. Slowly and rhythmically it moved its head and neck back and forth, at the same time giving a few low croaks. After resuming a normal position for a time, it wriggled its neck slowly, raised its crown feathers, and fluffed out its long, heavy neck plumage. During this part of the display it did not utter a sound. Lea observed this performance several times before the bird continued its flight downstream.

2. **Cochlearius cochlearius** (Linnaeus). Boat-billed Heron. Lea took an adult specimen of this tropical species along the Río Sabinas in 1941 (Sutton and Pettingill, 1942: 8). In 1947 we observed a group of two adult and two

young ones repeatedly along a short stretch of the Sabinas River near Pano Ayuctle, May 16 to June 2. Often we saw them perched separately on low snags or cypress 'knees' sunning themselves or preening. Favorite perches they sometimes shared with cormorants, *Phalacrocorax olivaceus* (Humboldt). The young birds were obviously small-billed and dull-colored in comparison with the adults. We noted nothing indicating the existence of a colony but believed that at least one pair had bred in the vicinity.

3. *Ictinia plumbea* (Gmelin). Plumbeous Kite. We saw this kite daily along the Río Sabinas throughout our stay. Edwards found two nests, each in a large cypress near the river. The first, discovered May 17, was upstream from Pano Ayuctle a hundred yards or so. It was about 70 feet from the ground on an upward sloping branch. We often saw one parent on the nest and the other in the very top of a tall dead tree not far away. Ordinarily docile, this pair occasionally circled above us, calling *dee-see, dee-see* in a high voice. These notes of protest reminded Sutton of the *phew-phew* given by protesting Mississippi Kites, *Ictinia mississippiensis* (Wilson), on that species' nesting ground in western Oklahoma (see Condor, 41: 49). On May 17 and 18 we could see the heads of two rather well developed young birds sticking up over the nest.

The other nest, discovered May 28, was about 90 feet from the ground and we did not learn what it contained. It was a quarter of a mile downriver from camp.

In a field-sketch of the perching kite drawn by Sutton on May 22, the tips of the folded wings extend *and cross* well beyond the tip of the tail. The feathers of the forepart of the crown are elevated into a sort of crest directly above the eye.

4. *Falco albigularis* Daudin. Bat Falcon. A pair of these falcons probably had a nest in a cavity in a large dead tree downriver from Pano Ayuctle half a mile. On May 22 Sutton stood under this tree watching the male and female perched above him. Neither squealed in protest nor dived at him. The testes of a male taken on June 1 by Lea were only slightly enlarged.

5. *Columba flavirostris* Wagler. Red-billed Pigeon. We saw a few of these pigeons along the Río Naranjo, May 13 to 15, but they were much commoner along the Río Sabinas, May 16 to 31. Their song was a windy *oooooo, up-cup-a-coo, up-cup-a-coo, up-cup-a-coo*. They often gathered in considerable flocks when drinking. In display flights, the males circled on slowly beating wings.

Edwards found a nest in a large cypress near the Sabinas on May 16. It was about 30 feet from the ground. We did not learn what it contained.

On May 21 Sutton found a nest with one egg in a small tree about six feet from the ground and 15 feet from the river at the edge of heavily shaded woods downstream a few rods from camp. The incubating bird flapped and fluttered noisily, and occasionally *growled*, when leaving the nest. The egg started to hatch on May 24, but on the 25th we found the partly hatched young one dead in the nest.

6. *Amazona autumnalis* (Linnaeus). Yellow-cheeked Parrot. This parrot is common along the Río Sabinas. It looks very much like the Red-crowned Parrot, *A. viridigenalis* (Cassin), which fact probably accounts for the failure of the Cornell University-Carleton College Expedition to list it in 1941. We saw it repeatedly near Pano Ayuctle, May 24-30, 1947. Lea collected a male (testes slightly enlarged), May 27, and Sutton collected a female (ovary considerably enlarged), May 30.

7. *Coccyzus americanus* (Linnaeus). Yellow-billed Cuckoo. Noted daily along the Río Sabinas May 17 to June 1. On May 23 Sutton collected a female in whose oviduct was a full-formed, though soft-shelled, egg. On May 24 Edwards found a newly finished nest, just ready for eggs, but the birds deserted it.

On June 2 we encountered a breeding pair of Yellow-billed Cuckoos in dry, brushy woodland on the top of the Mesa de Llera. Here, as along the Sabinas, the species seemed to share its habitat with *Coccyzus minor*. On June 3 we saw several Yellow-billed Cuckoos at Linares, Nuevo León.

8. *Coccyzus minor* (Gmelin). Mangrove Cuckoo. We saw and heard this cuckoo repeatedly along the Río Sabinas May 17 to 27. Its song was an odd *ca, ca, ca, goo, goo, goo*. On May 19 Sutton collected a female which would have

started egg-laying in a day or so. On May 20 Lea collected a female with full-formed egg in the oviduct. All birds which we saw May 19 to 27 appeared to be paired. We did not, however, find a nest.

On June 2 we encountered the species again in thin, dry woods on the very top of the Mesa de Llera. The tallest trees of this habitat were 20-25 feet high. Sutton collected a female with full-formed egg (measuring 33.0 x 23.4 mm.). Eaton and Edwards (1947) discovered the Mesa de Llera breeding ground of this species in 1946. The male they collected on June 17 of that year, and the three Tamaulipas specimens collected by us in 1947, represent the race *contidentialis* van Rossem. Range statements pertaining to *Coccyzus minor* in México should make clear the fact that the bird is not confined to the coast. Furthermore, insofar as interior Tamaulipas is concerned, "Mangrove Cuckoo" is certainly a misnomer.

9. *Campylopterus curvipennis* (Lichtenstein). Singing Hummingbird. Peters (1945: 18) gives the range of the northernmost race of this species as "southeastern México from San Luis Potosí to Vera Cruz and Oaxaca," but the bird actually ranges northward into Tamaulipas at least as far as the Gómez Farias region, where the Cornell University-Carleton College Expedition recorded it several times and collected one specimen in 1941 (Sutton and Pettingill, 1942: 17).

On May 15, 1947, just above El Salto, Sutton collected a male which was feeding about a flowering tree. Its testes were only slightly enlarged. On the same date, several hundred yards below the fall, Edwards found a nest (two eggs) in a huge cypress growing at the river's edge. The incubating bird was quite approachable and never attacked us. On being frightened off, it rose rather slowly through the branches of the cypress, then darted across the river or back into the woods. The nest was about two feet above the water on a slender, leafless (though living), downward projecting branch about three feet out from the bank. It appeared to be without support other than that afforded by the main branch, but actually it was built on a short horizontal twig which was hidden by the foundation. The cup proper, which was neat and compact, extended upward from the supporting horizontal twig about 1½ inches, but the mass of tousled plant fibers and dead cypress leaves of the pseudo-foundation extended downward another 4½ inches. The nest had an over-all diameter of 1¾ inches, but the cup was almost exactly an inch across (inside measurement) and ¾ inch deep. The upper half of the outside of the cup was decorated with bits of green moss and a few pale grayish blue lichens. The cup was deeply lined with buffy white plant fuzz. The eggs, which were almost fresh, measured 14.9 x 9.9 and 14.4 x 9.8 mm.

We had several opportunities to observe the incubating bird at very close range. We were struck by its motionlessness, by the largeness of its eyes, and by the great length of the protruding tail and wing-tips.

10. *Chloroceryle amazona* (Latham). Amazon Kingfisher. We recorded this species frequently along the Río Sabinas throughout our stay there. On several occasions we saw a male and female flying together past camp. This pair had a nest not far upstream about six feet above the water in a high bank. The entrance to the burrow was darkened by luxuriant vegetation which hung over the bank. A pair of Blue-crowned Motmots, *Momotus momota coeruliceps* (Gould), had a nest not far away, in the same bank.

We several times saw a kingfisher, with a large fish in its bill, near this nest. On one occasion Lea saw a bird enter the nest. On another occasion he heard the clamor of the young ones back in the burrow. The testes of a male specimen collected by Lea on May 27 were somewhat enlarged (about 4 x 6 mm.). The wing of this specimen measures 136 mm.; the tail, 79; the culmen, 71. It differs from the type of *C. a. mexicana* Brodtkorb (with which we have directly compared it) in that there is a tiny spot of white in the supraloral region.

Chloroceryle amazona has been recorded from numerous localities in Veracruz (see Ridgway, 1914. Bull. U. S. Nat. Mus. No. 50, part 6, p. 425), but not heretofore from Tamaulipas.

11. *Dryocopus lineatus* (Linnaeus). Lineated Woodpecker. On May 17 Sutton discovered a newly excavated nest of this species in a huge ear-tree

(*Pithecolobium*) not far from the Río Sabinas. It was about 40 feet from the ground, near the end of an almost horizontal dead stub, out about 20 feet from the main trunk. The early morning sun, which struck the nest-entrance squarely, made the red crests of the birds fairly blaze. The pair continued to live in the vicinity until about May 20, though we did not see them at the nest on that date. Instead we saw a female Coppery-tailed Trogon, *Trogon elegans* Gould, enter the cavity. We did not, however, see a trogon there again.

12. **Phloeocastes guatemalensis** (Hartlaub). Guatemalan Ivory-billed Woodpecker. We encountered this species only along the Río Sabinas. Its call-note was a sharp *keck* or *kack*, but its most characteristic "sound" was an incisive double-rap on dead wood.

On May 29, in woods well back from the Río Sabinas, Sutton was scolded so loudly by a pair that he thought he must be in the immediate vicinity of a nest. He was surprised, on investigating, to find three birds about him, one of them a young one. He collected this bird, a female in almost complete juvenal feather. The whole top of the head was glossy black, the only clear red plumage being that of the lower part of the crest. The fore part of the face (which is gleaming red in the adult female) was dark grayish brown, irregularly flecked with red. The eyes were light yellow. The bill was noticeably short, and almost wholly gray.

13. **Xiphorhynchus flavigaster** Swainson. Ivory-billed Woodhewer. Noted frequently along the Río Sabinas May 17 to June 1. It was common among the large cypresses near the water and also in brushy woodland well back from the river. Its song was a descending series of 7 to 10 loud whistles. Its usual alarm note was a terse *wheedle* or *feedle*. We several times encountered pairs which seemed disturbed by our presence. On May 23 we were energetically scolded by a bird which flew from tree to tree around us, occasionally singing. It opened its bill wide whenever it called, and when singing moved its head closer and closer to the tree trunk as the song progressed.

A nest which a Mexican showed Edwards held two eggs on May 25, three the following day. It was about 4½ feet from the ground in a cavity between a strangling fig "root" and the trunk of a huge cypress. The two trees grew at one end of a narrow island in the river. The opening to the cavity was long, narrow (not quite two inches wide at its widest point), vertical, and gradually tapered above and below (see photo). The nest proper was about three inches deep (with inch-deep cup) and was composed entirely of small, squarish flakes of bark which must have been gathered with considerable care. We never saw the bird on the eggs, for it slipped quietly off when we were within a few feet of the tree.

We collected the three eggs on June 1, rolling them from the nest with a whittled-off stick. One bird scolded continuously while we were at the nest, but its mate did not appear. The eggs were pure white and only slightly glossy. They measured 27.8 x 21.7, 29.3 x 21.4, and 28.4 x 21.3 mm.

14. **Myiodynastes luteiventris** Sclater. Sulphur-bellied Flycatcher. This distinctly migratory flycatcher (see Dickey and van Rossem, 1938: 354) was fairly common along the Río Naranjo May 13 to 16. Two pairs had nests near camp at El Salto, one about 25 feet above the ground in a hole near the top of a dead palm a quarter of a mile back from the river, the other in a hollow stub about 30 feet above ground in a large dead tree near camp. We saw a good deal of this latter pair. The male sang a gentle pre-dawn song which sounded something like *pi-wee shuttle*, *pi-wee shuttle*, repeated deliberately over and over (see Skutch, in Bent, 1942: 105). The note of protest was a sharp *weece*, *wheece*, or *his-eece*.

From May 17 to June 2 we noted *M. luteiventris* repeatedly along the Río Sabinas. We heard the early morning *pi-wee shuttle* song almost daily; heard the *his-eece* or *weece* callnote; and also heard other callnotes, including a well-defined *cheer* or *chu-eer*; a sharp *heck*, *pip*, *quip*, or *puck*; and a downward-inflected *tseu* or *chew*. Some of these other callnotes may have been given by that morphologically similar species, *Myiodynastes maculatus*, which also breeds along the Sabinas, but which the Cornell University-Carleton College Expedition failed



Nest of Ivory-billed Woodhewer in cavity between cypress trunk and 'root' of strangling fig, Río Sabinas, southern Tamaulipas, May 28, 1947. Photo by Robert B. Lea.

to list in 1941. To be quite frank about the matter, we never ascertained which callnotes were *wholly* distinctive for one species or the other. Careful work needs to be done with these two birds, especially in areas where their ranges overlap. Carriker (1910: 691) says that their habits "are the same" in Costa Rica; but according to T. K. Salmon (see Selater and Salvin, Proc. Zool. Soc. London, 1879, p. 514), "*Myiodynastes audax*" (= *Myiodynastes maculatus nobilis* Selater) of Colombia places its nest "in the fork of a tree or high bush," whereas we know that *M. luteiventris* nests in a cavity.

On May 22, in heavy woodland along the Sabinas, Lea collected a female *luteiventris* with ova almost ready to lay. He did not, however, find a nest in the vicinity.

On May 23, Sutton chanced to see a *Myiodynastes* fly from a natural cavity about 15 feet from the ground in a dead stub (seven inches dbh) much too infirm for climbing. The stub stood in brushy woodland well away from the river, not far from a much-used trail. The incubating bird was shy and undemonstrative, but a second bird (presumably the male) was aggressive in protest. This bird's principal callnotes were *heck*, *pip*, *quip* and *tseu*.

Sutton visited this nest daily from May 24 to 30, hoping to identify the birds without collecting them, and to assist Edwards in photographing them. He continued to obtain fleeting glimpses of one bird as it darted from the nest, and to hear the above-mentioned callnotes from another bird, but he did not identify these birds wholly to his satisfaction partly because, having actually collected *M. maculatus* in the vicinity (on May 22), he surmised that that species also was nesting thereabouts.

On May 26, Lea discovered a *luteiventris* nest about 25 feet from the ground in a large dead stub near the river. It was in a cavity, but we did not ascertain how far below the entrance the nest proper was. Edwards photographed the birds at the nest entrance several times May 28 to 31.

On May 30, Sutton collected a male *luteiventris* near the nest he had discovered on May 23, but failed to collect, or even to see, the incubating bird. While testing the strength of the nest-stub he broke it off, but caught it before it toppled, let it down gently, and found three undamaged eggs lying in a slight bed of bark-chips, leaf stems, and slender twigs in a shallow knot-hole. The bird had never *entered* a cavity of any sort—it had merely sat in, or on, the cavity and had thus been able to see out in several directions while incubating (see Bent, 1942, p. 102). The eggs, which contained large embryos, were creamy buff in ground color, handsomely marked with reddish brown, chiefly about the larger end. They measured 25.1 x 19.0, 25.9 x 18.9, and 25.5 x 18.0 mm.

Interested in learning how these eggs compared with authentic eggs of *Myiodynastes luteiventris swarthi* van Rossem, we sent them to Dr. Herbert W. Brandt, who found them to be "more pointed and somewhat smaller than," but otherwise similar to, eight eggs (two sets of four each) taken by him in the Huachuca Mountains of Arizona. In a letter to Sutton, dated July 15, 1949, he calls attention to the interesting fact that in Arizona the Sulphur-bellied Flycatcher "nests almost entirely in the sycamores at around 5000 to 7500 feet in the canyons; but does not go beyond the limit of the walnut trees that furnish it with their peculiar construction material [*i.e.*, the petioles of the walnut leaves]."

15. *Myiodynastes maculatus* (Müller). Streaked Flycatcher. This little known bird was fairly common along the Río Sabinas May 16 to June 1. We did not, however, learn anything about its pre-dawn song, alarm notes, nesting habits, or specific habitat requirements.

On May 22, in heavy woodland along the river, Lea took a male specimen (with much enlarged testes) as well as a female *luteiventris* (referred to above). On the same date, in brushy woodland several hundred yards away from the river, Sutton took a male *maculatus* (with much enlarged testes). Both these specimens represent the northern race, *insolens* Ridgway.

16. *Elaenia viridicata* (Vieillot). Azara's Elaenia. On May 18, Lea collected a male specimen of this flycatcher along the Sabinas between Pano Ayuctle and the Rancho Rinconada (the area in which the Cornell University-Carleton

College Expedition operated in 1941). Its testes measured about 4 x 5 mm. It neither sang nor called while Lea was after it. It perched on a low fence-wire in a shady place not far from the river.

The specimen is close to a nearly topotypical male of *E. v. placens* Selater (collected along the Río Atoyac, near Potrero, Veracruz) in the Sutton collection; but the borders of the yellow crown-patch are less distinctly black, and the whole bird is a trifle larger. The Potrero specimen measures: wing, 64 mm., tail, 62; the Río Sabinas specimen: wing, 68, tail, 65.

17. *Xanthoura yncas* (Boddaert). Green Jay. We did not see this species at El Salto, but we saw or heard it daily along the Río Sabinas, May 17 to June 2. It was rather secretive throughout this period.

On May 17 Sutton found a nest at the edge of a partly cleared area in well-shaded woods near the river. It was on a horizontal branch, 12 feet above the sloping bank of a small, dry tributary to the Sabinas, and was partly protected by a thorny frond of bamboo. The female slipped off quietly and flew some distance into the woods, but promptly returned, scolding loudly, when we "squeaked." The wall of the nest was so thin that the four eggs were faintly visible from underneath. We visited this nest repeatedly. On May 21 Sutton saw the male and female at the nest together, but he did not see them change places. The eggs hatched between May 27 and 31. On June 1 we examined the young birds, finding them to be entirely without down or feathers. The skin was olive-green all over.

On May 23 Lea found a nest and three eggs in a thicket not far from the river. It had been built on several nearly horizontal small branches close against the trunk of a slender sapling and was about 5½ feet from the ground. It was loosely constructed of slender twigs and rootlets, and had no lining. The eggs were very pale grayish blue, almost white, finely flecked with brown, chiefly at the larger end. The nest was about 15 yards from the active nest of a Crimson-collared Grosbeak, *Rhodothraupis celaeno* (Lichtenstein).

Edwards observed and photographed the activities at this Green Jay nest from a blind. When he entered the nest-thicket, one or both jays scolded him, but the incubating bird usually did not leave the nest until he approached it closely, and it promptly returned to the eggs shortly after he entered the blind. While on the nest it was not, so far as he could tell, disturbed in the least by movements and noises within the blind.

On May 26 Lea collected an adult male which did not have a brood-patch. On May 28 a Mexican showed Lea another Green Jay nest containing 3 eggs.

18. *Turdus grayi* Bonaparte. Gray's Robin. In general appearance and behavior this bird calls to mind *Turdus migratorius* Linnaeus, but its pale blue eggs are spotted and blotched with light brown, and at least one of its callnotes is quite dissimilar to any given by *migratorius*. We observed it repeatedly at El Salto, along the Río Sabinas, at the Mesa de Llera, and at Linares.

The song, which is melodious, is similar to that of *migratorius*, but is lower pitched, less loud, somewhat shorter, and often has double-phrases. A bird which sang near camp at Pano Ayuucte invariably included some such phrase as *kimmel-kimmel* at or near the end. The customary alarm note is a low *kuck-kuck*, *cup-cup* or *pup-pup*, suggestive of that of *migratorius*, but never preceded by the shrill *scree* or *screep* which *migratorius* gives when scolding a cat or person. A distinctive note given by *grayi* is a clear *plu-ree* or *pee-yoo-rah* which puzzled us greatly until we actually saw the bird producing it. We occasionally heard this note along the river in the quiet of the noon-hour, but it was especially characteristic of evening twilight.

A nest found by Edwards along the Río Naranjo on May 15 was in rather open, well-shaded woodland about 40 feet from the ground, on an epiphyte close to the sloping main trunk of a tall tree. We did not ascertain what was in this nest, but saw a bird go to it several times.

On May 19, along the Río Sabinas, we happened to see a Gray's Robin fly straight to its nest about 25 feet from the ground in a slender cypress on the bank just opposite from camp. It perched for some minutes on the rim, eyeing the contents. From May 29 to 31 both parents made trip after trip to our camp,

gathering mouthfuls of caterpillars from the ground. With the binocular we could see the heads of at least three young birds in the nest on May 31.

A nest found by Sutton on May 24 contained three eggs. It was about eight feet from the ground in a narrow patch of brushy woodland several hundred yards from the river. It was in the principal fork of a medium-sized tree and was well shaded all day. The incubating bird sat very close, almost allowing itself to be touched. We did not collect this nest, but its walls seemed to be firm, as if partly made of mud. When we last inspected it, on May 28, it contained one very young bird and two unhatched eggs.

19. **Vireo olivaceus flavoviridis** (Cassin). Yellow-green Vireo. We observed this bird daily. We found eight nests—four along the Río Naranjo (May 14 to 16) and four along the Río Sabinas (May 25 to June 2). The following table presents data concerning these nests:

Yellow-green Vireo Nests

<i>Date and locality</i>	<i>Condition</i>	<i>Site</i>
1. May 14, 1947 El Salto, San Luis Potosí	finished, but clutch probably not complete, since bird was not incubating	about 40 feet directly above bed of small stream in open woods near river; near end of horizontal branch of cypress (<i>Taxodium</i>)
2. May 15, 1947 El Salto	unfinished	about 20 feet above trail through open woods near river; near end of horizontal branch of unidentified leafy tree
3. May 16, 1947 El Salto	finished, but clutch probably not complete, since bird was not incubating	about 40 feet above partly cleared ground in woods near river; near end of horizontal branch of unidentified leafy tree
4. May 16, 1947 El Salto	unfinished	about 25 feet directly above trail through open woods near river; on horizontal branch in crown of unidentified leafy tree
5. May 25, 1947 Río Sabinas, Tamaulipas	4 eggs: 3 obviously somewhat incubated; 1 translucent	5½ feet from ground close to main upright stem of small <i>Randia</i> in woods well away from river
6. May 29, 1947 Río Sabinas	unfinished	about 40 feet above edge of cane field; on horizontal branch of unidentified leafy tree
7. June 1, 1947 Río Sabinas	finished; number of eggs not ascertained	about 18 feet from ground near trail through thickish woods well back from river; on horizontal branch of unidentified leafy tree
8. June 1, 1947 Río Sabinas	finished; number of eggs not ascertained	about 20 feet from ground in partly cleared woods well back from river; on horizontal branch of unidentified leafy tree; about 20 yards from Nest 5 (see above)

Careful observation of the Yellow-green Vireo has convinced us that it is a race of *Vireo olivaceus* Linnaeus. Our reasons for so believing are these:

1. Adult birds have distinctly red irides. This we observed repeatedly in the incubating birds at nest 5 (see above), but especially in a female captured in a net and painted direct from life by Sutton on May 15.



Nest of Yellow-green Vireo in sapling *Randia* along the Río Sabinas, in southern Tamaulipas, May 28, 1947. Photo by Robert B. Lea.

2. Songs are so much like those of *V. o. olivaceus* that transient individuals of the nominate race probably could not be identified on the basis of song alone. *Flavoviridis* sings throughout the middle of the day in the manner of the well known Red-eye. Only the males sing, and they may sing while incubating, though we did not actually observe this. Some of the song-phrases of *flavoviridis* impressed us as being briefer than those of the Red-eye.

3. Notes of alarm and protest are similar to those of the Red-eye. On May 14 we squeaked up pairs of birds which chattered without giving the characteristic nasal *quee* or *ye-an* of the Red-eye; but on May 15 we happened to be observing a pair of *flavoviridis* when a Squirrel Cuckoo, *Piaya cayana* (Linnaeus), flew into their nest-tree, and the vireos immediately began giving the *quee* or *ye-an* note.

4. *Flavoviridis* 'squeaks up' readily. Pairs are often the very first birds to respond. Their manner is identical to that of the Red-eye at such times. They lift their crests, lower their heads, spread and lower their tails, and crouch as they move among the branches with bills slightly parted, usually keeping close together as pairs (see Sutton, 1949, p. 17).

5. Nests are very much like those of the Red-eye in shape, situation and composition. They are slightly larger and may more frequently be lined with rachilla-skeletons and stems of grass than with strips of shredded bark. A series of nests should be collected for direct comparison with nests of *V. o. olivaceus*.

6. The eggs are very similar to those of the Red-eye.

7. The young in juvenal plumage differ from the adult just as the young Red-eye differs from the adult, in being light brown above, especially on the crown and back. A specimen in the Sutton collection (taken July 1, 1948, along the Río Sabinas) is in almost complete juvenal plumage.

8. *Flavoviridis* is, at least in Tamaulipas and El Salvador, distinctly migratory (see Sutton and Pettingill, 1942: 26.; and Dickey and van Rossem, 1938: 472-473).

Dr. Wetmore, who believes that *flavoviridis* is a full species, is wholly correct in stating that there is no "indication of intergradation [with *olivaceus*] in a series of *flavoviridis* . . . from Tamaulipas" (1943: 308). Neither is there, so far as we have been able to discover, any intergradation between Florida examples of the Scrub Jay, *Aphelocoma coerulescens* (Bosc), and examples representing the easternmost of the various western races of that species.

Further discussion of nest 5 (see table above) is in order. Sutton discovered this nest by flushing the bird accidentally as he walked through the woods. He visited it daily from May 25 to June 1; saw the birds change places on May 28; but never actually saw a bird singing on the nest. The incubating bird permitted very close approach, especially on May 30 and 31. Several pairs must have had nests in the immediate vicinity, for three or four males sang thereabouts almost continuously from well before sun-up until dark. The nest was robbed by some predator during the early afternoon on May 31.

We collected this nest (June 1). Its greatest outside diameter was about 3¾ inches, its greatest outside depth 3¾ inches. The cup proper was 2 inches in diameter and 1¾ inches deep. The nest was suspended from a slender (¼ inch diameter) forked twig at the point where this twig branched off the main upright stem (¼ inch diameter). It was composed of dry grass stems and blades, shredded bark, moss, leaf skeletons, and worn grass-blades, bound together with cobwebbing. The lining was of fine grass panicle-skeletons (rachillas) and a trace of shredded bark. Leaves sheltered the cup. The sapling *Randia* stood in a spot which was well shaded all day. (See photo.)

20. *Icteria virens* (Linnaeus). Yellow-breasted Chat. On June 3 near the south edge of the city of Linares, Nuevo León, in a grove of young orange trees along a much used highway, Edwards encountered a singing male Chat. After a brief search through a hedge growing between the grove and a large cane field, he found the nest, which contained four somewhat incubated eggs. It was in the very heart of the shrubbery, about two feet above the ground and two feet from the active nest of a Blue Grosbeak, *Guiraca caerulea* (Linnaeus). We collected the male Chat, finding that it belonged to the race *auricollis* Bonaparte (wing 77 mm.; tail, 83; exposed culmen, 14).

21. *Icterus cucullatus* Swainson. Hooded Oriole. Nowhere did we find this species common, though we observed it along the main highway in San Luis Potosí, Tamaulipas and Nuevo León. On June 1, along the Río Sabinas, Sutton collected a subadult male which had much enlarged testes. On that date he saw an adult male closely following a nest-building female.

On June 3, at a tourist court in Linares, Nuevo León, we found a Hooded Oriole's nest about 15 feet from the ground on the under side of a palm fan. Directly beneath the nest, on the grass, was the unbroken but scratched egg of a Red-eyed Cowbird, *Tangavius aeneus* (Wagler). In the nest were two oriole eggs, one of which was bashed in slightly, and two Red-eyed Cowbird eggs, one white, the other very pale blue. The shell of the white egg was considerably scratched and gouged, as if by the sharp beak or claws of a bird.

22. *Tanagra lauta* Bangs and Penard. Bonaparte's Euphonia. We saw this tanager repeatedly along the Naranjo and Sabinas Rivers. One of its most characteristic callnotes was a rapidly given *pidgel-eece*. Other callnotes were a conversational *chi-bib-bib-bib-bib*, which reminded us of certain notes of the Goldfinch, *Spinus tristis* (Linnaeus); a rough, hurried *tuck-a-tuck* or *chuck-a-chuck*; a clear *weet*, which was not unlike that of the Hooded Oriole; and a full-throated *queer* or *gleer*. Its song was short and explosive, calling to mind that of a White-eyed Vireo, *Vireo griseus* (Boddaert).

In fall and winter *Tanagra lauta* goes about in small companies, feeding largely on mistletoe berries. During latter May of 1947, however, most birds which we saw went about in pairs. On May 15 and 16, at El Salto, we watched two females gathering nest material, principally Spanish moss (*Tillandsia*). We followed one bird to its bulky, domed-over nest, which was in a large epiphyte, about 30 feet from the ground, in a huge cypress standing several rods back from the river. The male accompanied the female wherever she went, but did not gather material nor assist with the actual building. Once the female carried in a long, dark strip of bark which fluttered and flapped conspicuously. From time to time another male bird came to the nest, and this intrusion invariably led to an aerial wrangle which was most entertaining to watch. The fighting birds fluttered and darted about in great excitement. On one occasion (May 15) three males and two females were at the nest together, and a considerable altercation developed before the intruders were driven off.

A nest which we found May 20, along the Río Sabinas, was about 50 feet from the ground in an aerial and clump of Spanish moss. We repeatedly observed the birds at this nest May 20 to 28, but never climbed to it. Often we saw the female, closely followed by the male, going to the nest. The female flew directly to the entrance and went in immediately. The male never alighted at or near the nest, but darted off to one side.

23. *Thraupis abbas*. (Lichtenstein). Yellow-winged Tanager. We saw and heard the Yellow-winged Tanager along the Río Sabinas daily from May 20 to June 2. As a rule it stayed high in the cypress trees. Its song, a not very musical series of whistled chirps, reminded us somewhat of that of the Olive Sparrow, *Arremonops rufivirgatus* (Lawrence). One song to which we listened for some time descended in pitch toward the end.

A bird which we watched pulling bark or moss from a high branch on May 20 may have been gathering nest material. A female taken by Lea on May 29 had a well defined brood-patch and much enlarged ovary. The testes of a male taken by Sutton on June 2 were much enlarged (11 x 5 mm.).

24. *Habia rubica* (Vieillot). Red Ant Tanager. Stephen W. Eaton "saw four or five ant tanagers on the mountain in dense bamboo thickets under tall forest trees" near the Río Sabinas on August 7, 1946, but he did not identify the birds as to species (Eaton and Edwards, 1948: 112). In view of the fact that Lea collected a male specimen of *H. rubica* on the mountain two miles west of the Sabinas on May 29, 1947, the birds seen by Eaton may well have been *rubica*, for to the best of our knowledge the *Habia* inhabiting the brushy woodland at river-level in 1947 were all *gutturalis*.

The Lea specimen just referred to was probably breeding or about to breed (testes 4 x 4 mm.). It was subadult, presumably, for one tertial and several

rectrices were green rather than red in tone. We have identified the bird provisionally as *H. r. rubicoides* (Lafresnaye), though a strictly comparable male at hand, a specimen from Guatemala with partly green tail, is decidedly more pinkish (less orange) in general tone both above and below. The wing of the Tamaulipas specimen measures 92 mm., the tail 82.

25. **Habia gutturalis** (Sclater). Rosy-throated Ant Tanager. This ant tanager was first recorded from Tamaulipas long ago, but it has not, apparently, hitherto been listed from other localities than Tampico and Alta Mira. In the tangled woods just east of the Sabinas, we encountered it almost daily, May 18 to June 1. It went about in small companies. Often we heard its chattering or scolding in the distance. Its song was short, rhythmical and very rich-toned, with a quality which suggested the song of *Rhodothraupis celaeno*. It stayed near the ground in thick parts of the woods. To find it we had to make our way through the thorny 'wild pineapple', vines and brush. Sutton took an adult male on May 25 and two females on May 27. These females were members of the same close-knit flock, yet both were obviously laying eggs. The behavior of the birds strongly suggested that they might have been nesting semicolonally.

26. **Saltator atriceps** (Lesson). Black-headed Saltator. We saw or heard only a few of these Saltators along the Rio Naranjo, May 13 to 15. Along the Sabinas, on the other hand, the species was common. Its characteristic callnotes were *cheek*, *chu-eeek*, and *churr*, delivered in a loud, strident voice. These notes were sometimes combined into an exceedingly noisy *chicker*, *chucker*, *chucker*, *ur-ur-ur-ur-ur*, the last syllables so rapidly repeated as to become a rough trill.

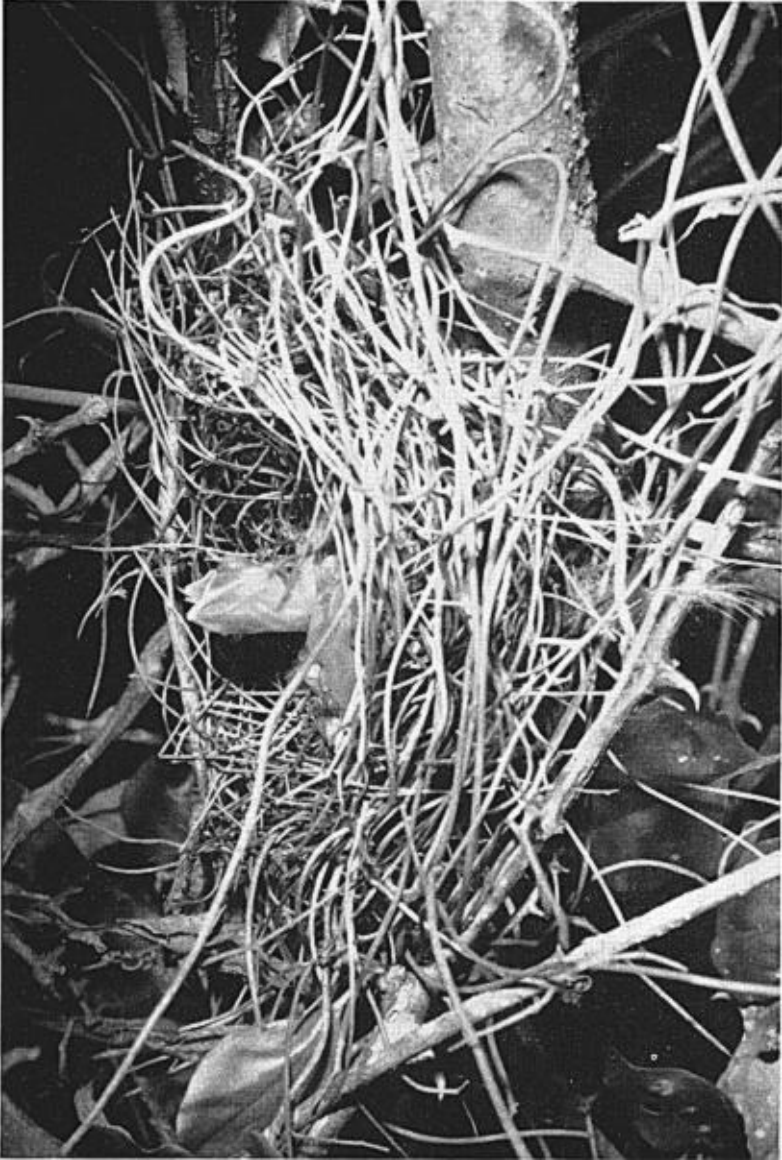
Several pairs lived near camp at Pano Ayuctle. We found three nests—bulky, sprawling, thin-walled, rather deeply cupped structures, in vine-covered shrubbery a few feet from the ground. We observed these nests from May 17 to 28, while they were being built. On the 28th all were finished and ready for eggs, but they appeared to have been deserted. Possibly egg-laying had not yet started.

27. **Saltator coerulescens** Vieillot. Grayish Saltator. We heard the loud, clear *chuck*, *chucker-pree* song of this species on May 16 in brushy woodland between the main highway and the Rio Sabinas, but thought at the time that we were listening to a Cardinal, *Richmondia cardinalis* (Linnaeus). Otherwise, we encountered the Grayish Saltator only on the opposite side of the river, in tangled shrubbery along the edges of the cultivated tracts. Sutton collected a male on May 19 and Lea collected 2 males on May 24. In all these the testes were much enlarged. Oddly enough, this species was not listed by Sutton and Pettingill (1942) nor by Eaton and Edwards (1948).

28. **Rhodothraupis celaeno** (Lichtenstein). Crimson-collared Grosbeak. We recorded this species along the Naranjo, along the Sabinas, and at Linares. The song was a rich, melodious warble sung from the shrubbery or heart of a tree, never from an exposed position such as the top of a bush. A characteristic note was a high, thin squeal. We did not hear any note of alarm or protest comparable to the sharp *chip* of the Cardinal.

On May 20, along the edge of a neglected orange grove not far from Pano Ayuctle, Edwards found a nest containing three eggs. It was about six feet from the ground in a tangle of vines and shrubbery; was partly sheltered by a slender dead tree which had half fallen over; and was, in general, like that of a Cardinal, but bulkier. The eggs were pale grayish blue, spotted all over with light brown. They resembled Cardinal eggs but looked blunter and considerably larger. We did not collect them because we wanted to obtain motion pictures of the parent birds. (See photo).

From May 21 to 31 Edwards spent much time in a blind near the nest. The male bird was obviously solicitous of the female, but Edwards never actually saw the male at the nest. On May 24 there were only two eggs in the nest (we have no idea what happened to the other). The remaining two eggs hatched, respectively, on May 26 and 27. The young were orange-skinned, with red mouth-lining. Their dorsal down was fairly thick and very dark. Edwards saw the female feeding the young. On June 1 when we last visited the nest, only one young bird was in it. The other probably had been destroyed by a predator.



Nest and small young of Crimson-collared Grosbeak, Río Sabinas, southern Tamaulipas, May 28, 1947. Photo by Robert B. Lea.

29. *Guiraca caerulea* (Linnaeus). Blue Grosbeak. From May 20 to June 1, along the Río Sabinas, we observed at least two Blue Grosbeaks repeatedly. One of these was a subadult male which sang hundreds of times near camp May 23 to 27; was joined by a female on May 27; and thereupon stopped singing except for short periods in the morning. This pair probably nested in shrubbery along the edge of a cane field.

While traveling north on June 2, we saw a fully adult male near the village of Encino and another near El Refugio (kilometer 631). At the Mesa de Llera, Lea collected an adult male (with much enlarged testes) which we have identified as *interjusa* Dwight and Griscom (wing, 92 mm.; tail, 72; culmen, 17). The brown of the lesser wing coverts was much more chestnut in tone than that of the tips of the greater coverts.

At Linares, Nuevo León, on June 3, Edwards discovered a singing subadult male Blue Grosbeak along the edge of an orange grove. After a brief search through the hedge bordering the grove, he flushed a female from a nest containing three somewhat incubated eggs. The nest was 3½ feet from the ground and about two feet from the nest (4 eggs) of a Yellow-breasted Chat (see above).

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