

## NESTING OF THE BIRDS OF MORELOS, MEXICO

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Although work on birds of the State of Morelos, México, has been carried on in the past by a number of individuals, this has been chiefly of a taxonomic nature, with the accent on descriptions of races and distributional details. Apparently there is little or nothing published on the nesting of most of the birds of this region. It was my good fortune to be able to work in Morelos with the primary purpose of recording nests. The following periods were spent collecting in the field: most of June, July, and August of 1958; from the middle of April through June of 1959; from the middle of May through July of 1960; and from the middle of May through June of 1961.

One of the reasons Morelos was chosen for study is because of the variety of faunal and floral zones and their proximity to one another. The town of Cuernavaca, at an elevation of approximately 5200 feet above sea level, was selected as a centrally located base of operations. Field work was conducted in the following places: at a low elevation of about 2000 feet in the southwestward part of the state near El Rodeo, which borders the banana and coffee groves; the rice growing country and the arid opuntia-candelabra cactus zone near Acatlipa; the heavy thorn jungle in the Yaútepec-Tepoztlán-Cuernavaca triangle; the pine-oak association with a heavy shrub and herbaceous understory in the 5000- to 7000-foot area; and the summit area in the pine-fir association at the 10,000-foot level near Tres Cumbres where the state lines of Morelos and the Distrito Federal meet. Obviously, floral and humidity differences from one life-zone to another were great, although the actual temperature changes were not extreme, and a complete change in the bird life could be encountered in a matter of less than an hour in any direction from headquarters.

## ACKNOWLEDGMENTS

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## METHODS

All the species listed in this paper, unless otherwise noted, are ones whose nests were discovered and inspected. Realizing that positive identification of nests was vitally

important, nothing was left to chance. In each case, the attending bird was either collected with the nest and eggs or was seen to flush from or arrive at the nest itself.

The specimens taken in the course of the approximately ten months of field work are now in the collections of the California Academy of Sciences, the Western Foundation of Vertebrate Zoology, the American Museum of Natural History, or the Universidad de México, México, D. F. A few specimens remain in my personal collection.

The elevations above sea level here reported were determined with a barometric altimeter.

In the species accounts, the use of trinomials has been avoided because of lack of opportunity to compare material from surrounding areas.

#### SPECIES LIST

*Buteo nitidus*. Gray Hawk. On June 16, 1959, a nest of this species was located about forty feet up in an inaccessible tree in Cañon de Lobos. The nest was made of small sticks and was rather well concealed in leaves near the top of the tree. It was assumed to contain newly hatched young, as the defense of the nest area by the adults was pronounced.

*Scardafella inca*. Inca Dove. Many nests of these doves were found in the lowlands near El Rodeo and Acatlipa in April and May, 1959; a set of two fresh eggs was taken on April 25 at El Rodeo. On this date, several other nests were found here, their contents ranging from one egg to half-grown young. At Acatlipa on May 16, 1959, several nests were found, some of which contained fresh eggs and others well developed nestlings. All of the nests located were placed from three to six feet up on horizontally growing pads of opuntia cactus.

*Columbigallina passerina*. Ground Dove. In the Acatlipa area, these doves were nesting abundantly in about the same numbers as the preceding species. The eggs and young were in the same stages of development. My notes record extreme dates for two fresh eggs on April 25, 1959, and July 25, 1960. The Ground Dove and the Inca Dove choose much the same locations for nesting. I found both species nesting a few feet apart in the same cactus thicket.

*Leptotila verreauxi*. White-fronted Dove. On May 9, 1959, a nest was found near Acatlipa. It was placed about five feet up in a mesquite bush and contained two nestlings nearly ready to leave the nest.

*Coccyzus americanus*. Yellow-billed Cuckoo. A female of this species, taken in thorn thickets five miles east of Cuernavaca at the 6000-foot level on May 23, 1961, is apparently the first record of this species from Morelos. The ovaries were inactive; it is likely that the bird was still in migration.

*Crotophaga sulcirostris*. Groove-billed Ani. These birds were abundant nesters in the lowland region around El Rodeo, and a set of five eggs, incubation advanced, was collected here on August 16, 1958. The nest of loose twigs was placed about eight feet up in a thorn bush. Near Acatlipa, on July 9, 1958, fully grown young were flying about and were being fed by parents. On July 18, 1960, at this same place, a nest was found containing four eggs in an advanced stage of incubation. The nest was placed about fifteen feet up in a *Ficus*. Both of these nests were heavily lined with fresh green leaves which are thought to provide moisture necessary to the successful incubation of the eggs. In both instances the adults were observed carrying additional green leaves into the nests on the dates mentioned while incubation of the eggs was in progress.

*Caprimulgus ridgwayi*. Ridgway Whip-poor-will. At a point five miles east of Cuernavaca, at approximately 6000 feet elevation in the thorn jungle association, a female of this species was flushed from two eggs which were laid on a few dry leaves on the ground in the broken shade of the thick understory. The eggs have a buff ground color and are heavily marked all over with brownish and lilac spots and streaks. They were nearly ready to hatch on May 23, 1960. The eggs measure  $21.5 \times 19$  and  $21 \times 19.6$  mm. On a ridge above Cañon de Lobos on May 29, 1961, a female was flushed from a nest on the ground in the shade of an opuntia cactus; the nest contained two young about a week old.

*Chlorostilbon canivetii*. Canivet Emerald. On June 16, 1959, a nest of this hummingbird was found three-fourths built in Cañon de Lobos. The nest was fastened to an overhanging branch of a low growing shrub and was placed about three feet up, directly over the bottom of a small creek bed which was dry on this date. In as much as the rainy season was due, the creek would have con-

tained running water by the time young hatched. The nest was of fine plant down, beautifully lined, and covered with pieces of bark on the outside. I was unable to return to this nest for any further investigation.

*Amazilia beryllina*. Berylline Hummingbird. On July 8, 1960, in Cañon de Lobos, a female of this species was observed carrying lichens to a half completed nest which was saddled to an overhanging branch of a shrub. This nest was in a similar location to that of the nest of the preceding species. When I returned to the nest on July 19, it was partly destroyed by the unusually violent rains which had occurred in the interim, and it was deserted.

*Trogon mexicanus*. Mountain Trogon. A pair of these birds had a nest about twelve feet up in a natural cavity of a well rotted pine stub in the pinewoods association, at the 8500-foot level, about ten miles from Cuernavaca. When the nest was discovered on May 17, 1959, it contained two newly hatched young, and the male was brooding at that time. This was the only nest of this species found.

*Momotus mexicanus*. Rufous-crowned Motmot. On June 8, 1959, at an elevation of 6000 feet in the thorn jungle, five miles east of Cuernavaca, a pair of these birds was seen feeding two fully grown young which were flying about. A third juvenile was perched at the entrance of a cavity about five feet up in the bank of a small ravine. This cavity was presumed to be the nest site.

*Colaptes cafer*. Red-shafted Flicker. At the 8000- to 9000-foot level in the pinewoods above Cuernavaca, a pair of these birds had a nest in a dead pine. On May 25, 1959, they were seen entering the cavity with food for young. Flickers were not abundant in this region.

*Xiphorhynchus flavigaster*. Ivory-billed Woodhewer. On June 3, 1961, I collected a male of this species in full breeding condition at about 5000 feet elevation in Cañon de Lobos. This appears to be the first record of this species occurring in the state of Morelos and extends the range of this bird much farther into the interior of México than has previously been known (Mexican Check-list, Pac. Coast Avif. No. 33, 1957:48-49).

*Lepidocolaptes leucogaster*. White-striped Woodhewer. On May 25, 1960, a nest was found in the pinewoods above Cuernavaca at 9000 feet elevation. It contained three young about a week old. The nest cavity, formed by the growing together of two branches, was approximately fifteen feet up in a live pine. Both adults were active in bringing food to the young and many visits were made to the nest on the morning these observations were made. I was unable to hear a single note of communication between the adults or between an adult and the nestlings during this feeding procedure. The adults remained silent even when they arrived at the nest site simultaneously.

*Platysaris aglaiae*. Rose-throated Becard. On June 16, 1959, several nests were found on the steep slopes of Cañon de Lobos. All the bulky nests were suspended from hanging branches of tall trees and were completely inaccessible. On June 7, 1960, a female with a definite brood patch was collected. A nest nearby was collected by severing a small branch above the nest with a shot gun charge. The nest contained three incubated eggs.

*Pyrocephalus rubinus*. Vermilion Flycatcher. These flycatchers were abundant in the lower elevations and were nesting up to 6000 feet in the thorn jungle east of Cuernavaca where a nest was being built on May 11, 1959.

*Myiarchus nuttingi*. Nutting Flycatcher. Ten miles from Cuernavaca toward Tres Cumbres, at an elevation of about 8000 feet, a pair of these flycatchers had a nest in an old woodpecker hole in a dead oak about twelve feet from the ground. On May 30, 1959, the nest held three newly hatched young. On May 17, 1960, another nest was found at 6000 feet elevation, about five miles east of Cuernavaca. This nest was about five feet up in a rotted natural cavity of an *Ipomoea arborescens*. The nest contained four eggs which were piped.

*Contopus sordidulus*. Western Wood Pewee. Two nests of this pewee were found at the 6000-foot level, five miles east of Cuernavaca in the thorn jungle association. The nests were saddled to the top branches of an *Ipomoea arborescens* and were about twelve to fifteen feet from the ground. One nest, collected on May 21, 1959, had two fresh eggs; the other nest, collected on May 28, 1959, contained two slightly incubated eggs. The nest construction and nesting behavior of these birds is similar to that of Western Wood Pewees in California.

*Contopus pertinax*. Coues Flycatcher. One nest of this species was found on June 3, 1959, saddled to a horizontal dead pine limb forty feet up. The nest tree was at the 7000-foot level in the pine-

woods above Cuernavaca. The nest contained newly hatched young on this date, as indicated by shells of recently hatched eggs found on the ground under the nest.

*Aechmolphus mexicanus*. Crested Wood Pewee. This rare flycatcher was described by Zimmer in 1938 (Auk, 55, 1938:663-665). This species apparently is known only from the central section of Guerrero, Morelos, Michoacán, and Oaxaca.

On June 16, 1959, a drab-colored flycatcher flushed from a nest by the side of a little used trail in Cañon de Lobos. The nest was suspended about five feet from the ground in hanging branches of a thick bush by the side of the trail. It was neatly lined with fine rootlets and grasses and had many long grasses streaming down for ten inches on the outside. The nest contained two fresh eggs which were collected; these measured  $19 \times 14$  and  $19.5 \times 14.5$  mm. Upon being disturbed, the female was very nervous and kept flipping her tail up and uttering soft guttural sounds. Although the male could have been close by, it was not seen, perhaps because of the thick undergrowth in the immediate vicinity. Nest construction and nest location appear to be very similar to those of *Empidonax traillii*, the Traill Flycatcher, but the eggs have a darker brownish cream base color than the eggs of *E. traillii*.

By using the knowledge gained about location and habits from this first discovery, nine specimens and four nests were taken in 1960; each nest contained three eggs. Three nests were found about five miles east of Cuernavaca, one on May 19 and two on May 23, all with fresh or slightly incubated eggs. The other nest, collected in Cañon de Lobos on June 7, contained slightly incubated eggs. These four nests were all suspended from two or three points in overhanging dead and dried branches of thick shrubs. The nest collected in 1959 was in living vegetation. These flycatchers appear to be of very local distribution in Morelos, and they are easily overlooked because of their shy and retiring habits and the greenish color of their plumage which blends perfectly with the surrounding vegetation.

*Empidonax affinis*. Pine Flycatcher. On May 25, 1960, two nests of this species were found about half completed. They were in the pinewoods above Cuernavaca at an elevation of 8500 feet. Both nests were about fifteen feet up in forks of small branches of upright growing oaks, and they were very cleverly concealed. Although several attempts were made to return to these nests, I was never able to relocate the nest trees again due to the similarity and abundance of trees in the area.

*Empidonax difficilis*. Western Flycatcher. A nest of this flycatcher, located on May 30, 1959, contained three young nearly ready to leave the nest. The nest was in a small, dark, mossy barranca near Cuernavaca at an elevation of 8500 feet. It was placed on a mossy ledge about three feet from the bottom of the ravine and resembled nests of this species found in the western United States. In 1960 four nests of this bird were found within a half-mile radius of the above-mentioned nest. All were in similar locations, and each contained three fresh eggs. Two of the four nests were found on May 21, and the others were found on June 14 and June 22, respectively.

*Mitrephanes phaeocercus*. Tufted Flycatcher. A nest of this species was found on May 11, 1959, at the 8000-foot level in the pinewoods ten miles from Cuernavaca. The nest was firmly saddled to a dead horizontal pine limb about forty feet from the ground. It contained one large young. The nest was very ornate. It was covered on the outside with oak lichens and was only located by watching the parents dart in to feed the young. Even after knowing the exact location in the tree, the nest was barely discernible from the ground. About a mile from this nest, on May 25, 1959, a full grown, flying juvenile was seen being fed by a parent.

*Myiopagus viridicatus*. Yellow-crowned Elaenia. In the thorn thickets of the Yaútepec-Tepoztlán-Cuernavaca triangle, these flycatchers are fairly common, but the finding of a nest was one of the most tedious and frustrating experiences I have ever had. In the season of 1958, many days were spent in this area observing and searching for a nest but with no success. A nearly full grown juvenile was taken on July 26, 1958. On June 6, 1959, while I was sitting quietly under a cover of thick trees and bushes in the same region, a Yellow-crowned Elaenia flew to the top of the tree under which I was sitting. It seemed to be tugging at nest material. Upon closer examination, I saw that there was a nest structure, and two half-grown young could be seen plainly through the very frail bottom of it. The nest was about twenty feet from the ground. Up to this time, I had been searching for a nest in the low understory growth where the birds were usually seen.

Several days later, a female was seen with a piece of vegetation in her bill and by patiently watching, she led me to a nest site which was about twenty feet up at the extreme top of a very thin-branched *Ipomoea arborescens*. On June 20, 1959, West and I returned and collected this nest which

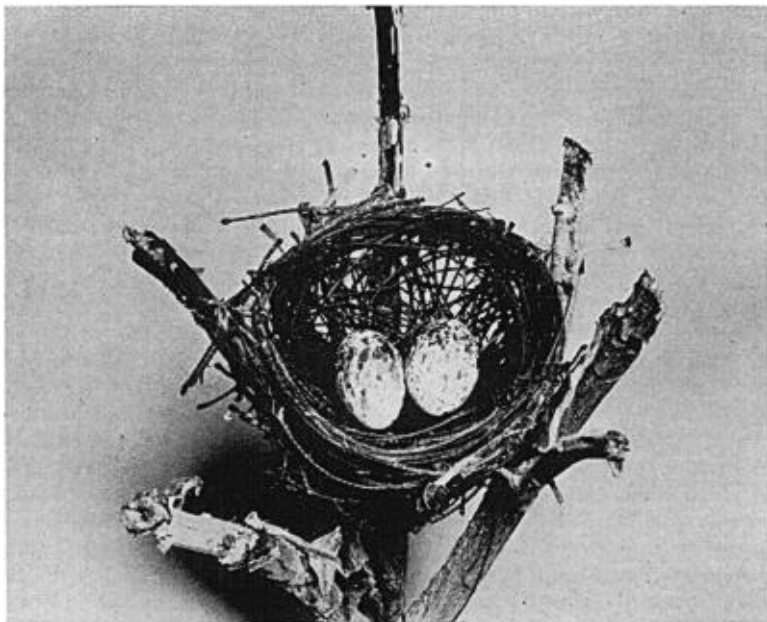


Fig. 1. Nest and eggs of the Yellow-crowned Elaenia (*Myiopagus viridicata*).

then contained two eggs in which incubation had commenced. These two eggs measure  $18 \times 13$  and  $17 \times 12.5$  mm. and are handsomely marked with heavy lilac and chocolate brown colored streaks and blotches over most of the surface. The nest measures 45 mm. inside diameter and is only 15 mm. in depth. It is entirely made of what appears to be short twigs of a tree or vine. These are woven and interlaced to form a symmetrical structure which is so small in proportion to the size of the bird that the head and tail of the brooding female extended completely over the edge. The nest was not "saddled" to a branch as is done by the Western Wood Pewee or Phainopepla (*Phainopepla nitens*) but it was attached by spider webs to the fine branches.

While I was in this area early on the morning of July 2, 1960, I saw two females gathering wet spider webs from the low understory. Both individuals led me to their nests. One nest was placed about fifteen feet up and the other about twenty-five feet up in *Ipomoea arborescens*. The nests were well concealed in the leaves of these shrubs. On July 10, 1960, I returned to the area and found that each nest contained two eggs. One set was fresh and in the other incubation had commenced. The measurements of two of these eggs are  $17.8 \times 13$  and  $17.6 \times 13.1$  mm. My experience with these four nests convinces me that it is nearly impossible to find a nest of the Yellow-crowned Elaenia unless the female leads one to it.

*Camptostoma imberbe*. Beardless Flycatcher. My notes show that in the thorn area at Tepoztlán on May 17, 1960, a nest was found about twenty feet up, well concealed, in the dried seed pods at the end of a top branch of *Ipomoea arborescens*. This nest was ready for eggs on this date, but it was destroyed by heavy wind on the night of May 19. Also, in a similar location in this area on June 14, 1960, a nest was found to contain three eggs that were about ready to hatch. The nest was about thirty feet up and was made of whitish, fine plant down. The nest was completely covered and had an entrance on one side. The base color of the eggs was white with reddish brown spots on the larger end.

*Petrochelidon pyrrhonota*. Cliff Swallow. On June 29, 1960, members of a colony of about thirty pairs were actively building nests on a cliff near the village of Tepoztlán. The nests were about forty feet from the ground.

*Stelgidopteryx ruficollis*. Rough-winged Swallow. On June 20, 1961, a nest of this swallow was

found near Ocotepéc. The nest was in the process of being constructed and was located in a natural cavity of an earth bank about five feet above the ground. Rough-winged Swallows were not abundant in the area.

*Hirundo rustica*. Barn Swallow. Many pairs of these birds were building nests in recesses of roofs of houses in the area adjoining the rice fields near Acatlipa on June 22, 1961.

*Parus sclateri*. Mexican Chickadee. In the pinewoods above Cuernavaca, at the 8000-foot level, a pair of these birds was busily carrying food to young in a nest on May 11, 1959. The nest was in a dead branch of a pine tree about twenty feet from the ground.

*Psaltriparus melanotis*. Black-eared Bushtit. On May 6, 1959, at an elevation of 8000 feet, young of this species were seen flying about and were being fed by adults. Also, on May 30, 1959, five nearly hatched eggs were collected in the same area from a well concealed nest placed about twenty feet up at the top of an oak sapling. The male was incubating and was collected; the female was not seen. This was in the pine-oak association about ten miles above Cuernavaca. In this same area, on May 31 and June 9, 1960, two nests were found about six feet up in dead bushes; each nest contained four eggs which were well advanced in incubation.

*Certhia familiaris*. Brown Creeper. One nest of this species was found ten miles above Cuernavaca, at 8300 feet, in the pinewoods on April 30, 1959. The nest was placed behind a piece of bark of a dead pine stub about two feet from the ground. It contained one half-grown young. Many juveniles were seen in this area in May and June.

*Thryothorus pleurostictus*. Banded Wren. On June 13, 1959, a wren of this species was seen feeding fully fledged young in Cañon de Lobos. The birds were within twenty feet of a nest which appeared to have been recently used. In this same canyon, a nest was found on July 19, 1960. It contained two nearly hatched eggs of the Red-eyed Cowbird and no eggs of the Banded Wren. This nest, which was fastened securely to a hanging branch of a thorny tree, was placed about eight feet up. It was made of fine grasses and was completely hooded. It had an entrance tube four inches long which opened at the side and below the nest proper. Upon approaching the nest, the female flew vertically upward into the entrance in an uninterrupted flight. It is difficult to understand how the cowbirds managed to enter this nest.

*Troglodytes aedon*. Northern House Wren. At 8500 feet elevation in the pinewoods above Cuernavaca, a nest of this wren was found on May 31, 1960. It contained three nearly hatched eggs. The base color of the eggs is whitish with a heavy wreath of brown spots around the thickest part and a sprinkling of the same brown spots over the remaining surface. The nest was made chiefly of pine needles and was lined with feathers. It was placed eight feet up and was well concealed in a clump of pine needles caught in a fork of a small oak. Upon being flushed from the nest, the female slipped away in the understory without a single note of protest and silently returned about a half-hour later. The male was not present during the entire investigation.

Another nest was found on June 22, 1961, in the same area. It was placed about six feet up in an exposed gopher hole in a dirt bank. It contained five eggs, slightly incubated. These wrens belong to the rather distinctive group of brown-throated races of this species.

*Catherpes mexicanus*. Canyon Wren. A nest containing two recently hatched young and one addled egg was found on June 6, 1959. The nest was about five miles east of Cuernavaca on a ledge in a volcanic cave some thirty feet below the outside ground level. Many nesting sites were found in niches of adobe walls in houses in the villages, but I was unable to examine them.

*Melanotis caerulescens*. Blue Mockingbird. About five miles east of Cuernavaca at 6000 feet elevation, a nest was found fifteen feet up in a small oak. The nest contained two young, just hatched, on June 2, 1960. The nest was lined with fine rootlets and grasses with a solid base of large twigs exteriorly. A set of eggs taken in Oaxaca in 1961 are intensely blue green all over and unspotted.

*Toxostoma ocellatum*. Ocellated Thrasher. A nest containing two slightly incubated eggs of this bird was found on June 3, 1960. The nest was about four feet up in thick understory in the pinewoods association at an elevation of 8500 feet above Cuernavaca. The nest was typical of the species, being constructed of coarse sticks and lined with fine rootlets. The base color of the two eggs is greenish, and they are heavily marked all over with reddish streaks. The eggs measure 30×20 and 29×19 mm.

The male was not seen or heard, and the female did not utter any sounds of protest upon being flushed from the eggs. About a half-hour later, she approached very stealthily on the ground until she was directly under the nest, whereupon she jumped up to the nest and settled on the eggs.

*Toxostoma curvirostre*. Curve-billed Thrasher. Six nests of this species were found. All were placed in opuntia cactus as follows: El Rodeo, April 26, May 3, 1959, three and four eggs, respectively; Acatlipa, May 14, May 18, 1959, July 9, 1958, three eggs each, July 14, 1958, two eggs. The female was incubating in the nest found on July 9, 1958, and there were three fully grown juveniles and a recently used nest in the same cactus thicket. It is believed that the juveniles were from an earlier brood of this female and that the sets of eggs found in July constituted a second nesting.

*Turdus assimilis*. White-necked Robin. A nest of this robin was found on May 25, 1959, in the pinewoods above Cuernavaca at 8500 feet. It held three young ready to leave. The nest was placed on the side of a moss-covered rock outcropping ten feet up from the bottom of a small ravine. This nest was in much the same location as that chosen by the Western Flycatcher (*Empidonax difficilis*). On June 6, 1960, in this same area, a nest was found that contained three young about a week old. The nest was a bulky affair made chiefly of pine needles and moss and was placed about eight feet up in a crotch of a sapling oak. Unlike the nest of the American Robin (*Turdus migratorius*), no mud was used in the construction. The adults were decidedly vociferous while the nest was being examined.

*Catharus occidentalis*. Russet Nightingale-thrush. Eleven nests of this species were found in low bushes and forks of sapling trees from four to six feet up. All were found at the 8000- to 9000-foot level in the pinewoods above Cuernavaca. This elevation was the zone of maximum nesting activity for the species in Morelos. The eggs of this species from Morelos are robin egg blue and unmarked. The eggs average 22.5×17 mm. Most nests were made entirely of moss, but some were lined with fine grasses and a few pine needles.

The data on these eleven nests are as follows:

Date	Number of eggs	Incubation
April 27, 1959	3	Fresh
April 27, 1959	2	Slight
April 27, 1959	3	Slight
May 6, 1959	3	Fresh
May 6, 1959	2	Slight
May 6, 1959	2	Fresh
May 21, 1960	3	Slight
May 21, 1960	2	Slight
June 10, 1959	2	Fresh
June 20, 1960	2	Slight
June 22, 1961	3	Slight

*Catharus aurantiirostris*. Orange-billed Nightingale-thrush. Seven nests of this thrush were found; all contained three eggs each. The nests are made of grasses and some moss, but they are generally more compactly built than those of the preceding species. However, the eggs are entirely different in coloration. They have a pale bluish background and are very heavily marked, particularly on the larger end, with reddish and brownish streaks and spots. Five of the seven nests were found at the 6000-foot level in the thorn thickets five miles east of Cuernavaca; the other two nests were found at the lower edge of the pine-oak association at approximately 7000 feet elevation. The five nests found in the thorn thickets were all placed from four to six feet up in low growing bushes or small trees. One of the other two nests was placed about fifteen feet up on a horizontal branch of a pine and the other was twelve feet up on a horizontal limb of an oak. The latter contained two eggs of the Red-eyed Cowbird.

The females of both this species and the preceding one were very close sitters on the nest, but once they were flushed from the eggs, at least a half hour of quiet waiting and watching was necessary before the brooding females would return. At no time was there any active scolding.

The eggs averaged 23×18 mm. The data are as follows:

Date	Number of eggs	Incubation
May 3, 1959	3	Well commenced
May 21, 1959	3	Fresh
June 9, 1959	3	Fresh
June 10, 1959	5 (2 of Red-eyed Cowbird)	Hatching
June 29, 1958	3	Commenced
July 2, 1960	3	Fresh
July 4, 1960	3	Slight



Fig. 2. Nest and eggs of the Orange-billed Nightingale-thrush (*Catharus aurantii-rostris*) taken five miles east of Cuernavaca, Morelos, México, on May 21, 1959.

*Sialia sialis*. Eastern Bluebird. A nest containing four eggs ready to hatch was found in a cavity of a pine stub five feet from the ground on June 3, 1959. The nest was in the pinewoods about ten miles above Cuernavaca at an elevation of 8000 feet. This species is not abundant at this locality.

*Ptilogonys cinereus*. Gray Silky Flycatcher. At the 7000-foot level above Cuernavaca, in the upper pine-oak association, two nests of this flycatcher were found on June 10, 1959. They were neatly cupped and saddled to oak limbs, one about six feet up and the other about ten feet up. One nest was ready for eggs and the other held two half-grown young. The adults scolded noisily while we remained in the vicinity of the nests. I was unable to return to inspect the nest which was ready for eggs.

*Lanius ludovicianus*. Loggerhead Shrike. A nest with five eggs nearly ready to hatch was found near Acatlipa on May 16, 1959. The nest was ten feet up in a thorn tree. Two fully grown young were collected in the same area on July 14, 1958.

*Vireo huttoni*. Hutton Vireo. During the first ten days of June of 1959, we observed several family groups with fully grown young noisily begging for food in the pinewoods above Cuernavaca at about the 8500-foot level. One nest was found suspended from a fork of a branch of a small oak. The nest was about four feet above the ground and was entirely made of green moss. The condition of the nest indicated that young had recently left. On May 25, 1960, in this same area, a female was collected with a fully formed egg in the oviduct.

*Vireo hypochryseus*. Golden Vireo. On July 2, 1960, I found a nest of this vireo five miles east of Cuernavaca at about 6000 feet elevation. While I was quietly observing an Orange-billed Nightingale-thrush, a Golden Vireo flew in front of me and went directly to her nest. The nest was about twenty feet up and was very cleverly concealed in the outer branches of an *Ipomoea arborescens*. Upon closer examination I found the nest was nearing completion. Consequently, I returned to the nest on July 10, 1960, and found three slightly incubated eggs. The base color of the eggs is white, but they are very heavily marked around the large end with reddish streaks and dots. These eggs have much more color than I have ever seen in the eggs of any species of vireo. The three eggs measure  $20.5 \times 14.4$ ;  $19.8 \times 13.9$ ;  $19.6 \times 13.8$  mm.

As is typical of vireos, the nest I collected is suspended from a small forked branch and is covered externally with lichens, spider nests, and small bits of paper. The lining is of fine grasses, rootlets, and cattle hair. Since it is constructed very close to the beginning of the bifurcation of the small branches,



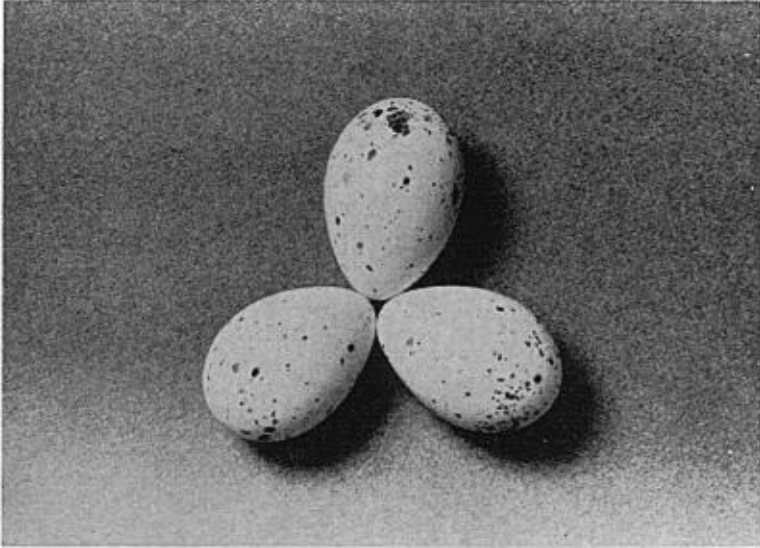


Fig. 3. Eggs of the Golden Vireo (*Vireo hypochryseus*) taken five miles east of Cuernavaca, Morelos, México, on July 10, 1960.

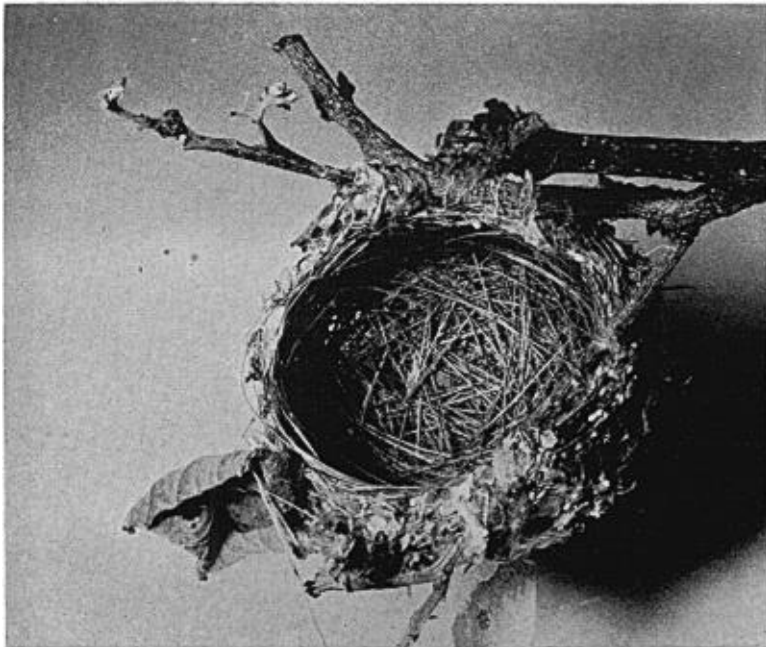


Fig. 4. Nest of the Golden Vireo taken five miles east of Cuernavaca, Morelos, México, on July 10, 1960. The nest was 20 feet up in an *Ipomoea arborescens*.

the nest is slightly ovate so that the inside diameter of the cup varies from 43 to 55 mm. whereas the depth of the cup is 37 mm. The external diameter averages 70 mm. Both adults were present while I was collecting the nest and eggs, but they were very shy and did not come to the nest tree during this activity, nor was there any of the scolding one usually hears near a vireo nest.

*Vireo flavoviridis*. Yellow-green Vireo. In Cañon de Lobos on July 19, 1960, a nest of this species was found about fifteen feet up in an ash tree. Both adults scolded loudly while I examined the nest contents which proved to be three eggs of the Red-eyed Cowbird and none of the vireo. The cowbird eggs, far advanced in incubation, appeared to be from three different individuals, as they varied in size and color.

In this same canyon, on June 19 and June 24, 1961, two more nests were located in ash trees. One nest contained five fresh eggs, two of which were of the Red-eyed Cowbird; the other held four fresh eggs and two eggs of the cowbird. Both nests were about eight feet from the ground.

*Neochloe brevipennis*. Slaty Vireo. For details of nesting of this species see Rowley and Orr, *Condor*, 62, 1960:88-90.

*Vermivora superciliosa*. Hartlaub Warbler. On June 20, 1959, a well concealed nest containing three, white, unmarked eggs was taken from a clump of ferns growing from the side of a mossy oak limb. The nest was placed about ten feet from the ground and was at an elevation of 8500 feet in the upper pine-oak association above Cuernavaca. The eggs were badly stained from the wet moss which was used in the nest construction. Skutch (*Pac. Coast Avif.* No. 31, 1954:377) describes three nests found in Guatemala and all were placed on the ground. Since this was the only nest I found, I am unable to say whether or not the nest site was normal for this species in Morelos.

*Dendroica fusca*. Blackburnian Warbler. On June 6, 1959, a male of this species was collected at an elevation of about 6000 feet at a point five miles east of Cuernavaca. On May 17, 1960, within a half-mile of the same place, another adult male was collected. These birds were alone when taken. The species has been recorded from Chiapas (Phillips, MS) and the eastern states of México; this is apparently the westernmost reported occurrence of this species. One specimen is now in the collection of the Western Foundation of Vertebrate Zoology, and the other is in the collection of the California Academy of Sciences.

*Chamaethlypis poliocephala*. Ground Chat. About five miles east of Cuernavaca in some dry grass bordering a cleared field, a female flushed from a nest six inches from the ground. On May 28, 1959, this nest, which was made entirely of various sized grasses, contained three eggs, one of which was punctured as if by a toenail. I waited near the nest for one hour but no male appeared so the female was collected for positive identification. This nest was in a very arid area with no surface water for a mile in any direction. However, with the coming of the rainy season there would have been water available nearby at the time young would have hatched.

*Granatellus venustus*. Red-breasted Chat. Mention is made of this species because I took a male in Cañon de Lobos on May 29, 1961. The bird was alone and proved upon examination of the testes to be in breeding condition; no nest was found. This specimen is the first recorded in the state of Morelos and is now in the collection of the American Museum of Natural History. Part 2 of the Mexican Check-list (*Pac. Coast Avif.* No. 33, 1957:265) states that the species "breeds on Pacific coast from northern Sinaloa to Chiapas. In winter vagrant up slope and to eastward. Recorded from Sinaloa . . . in winter up to 3000 feet in northern section." The specimen I collected extends the apparent breeding range into the interior. The elevation at the point of collection was approximately 5000 feet.

*Setophaga ruticilla*. American Redstart. The securing of a female of this species from the pine-woods above Cuernavaca at 8500 feet elevation on June 6, 1960, is worthy of mention here. The bird was alone when taken and undoubtedly was in migration as the ovaries were in an inactive state. The fact that this redstart was taken on the west side of the Sierra Madre Occidental and the date on which it was taken make this record significant.

*Myioborus miniatus*. Slate-throated Redstart. On June 1, 1959, while searching for a nest in the pinewoods above Cuernavaca at 8500 feet elevation, I stepped on a nest of this species containing three eggs. The nest was well concealed in the pine needles on the ground. In this same area another nest was found on June 30, 1960, containing three young about three-fourths grown. This nest was also placed in pine needles on the ground.



Fig. 5. Nest of the Yellow-green Vireo (*Vireo flavoviridis*) containing three eggs of the vireo and two eggs of the Red-eyed Cowbird (*Tangavius aeneus*). Cañon de Lobos, Morelos, México, June 19, 1961.



Fig. 6. Nest and eggs of the Ground Chat (*Chamaethlypis poliocephala*) found five miles east of Cuernavaca, Morelos, México, May 28, 1959.

*Basileuterus rufifrons*. Rufous-capped Warbler. A nest of this species was found at about 9000 feet elevation in the pinewoods above Cuernavaca on June 20, 1960. It was well concealed under pine needles and contained three young about a week old. On July 12, 1960, about five miles east of Cuernavaca at an elevation of 6000 feet a nest was found on the side of a small bank of volcanic lava. It was well concealed in ferns and weeds and contained four eggs, nearly ready to hatch. Another nest was found on July 15, 1960, in Cañon de Lobos at an elevation of 5000 feet. The nest was well concealed in ferns and held five fresh eggs, two of which were of the Red-eyed Cowbird.

The nests are rather elaborate, being constructed of leaves and grasses and completely covered with a hood of woven grasses which extends down over the front forming a short chute through



Fig. 7. Nest of the Rufous-capped Warbler (*Basileuterus rufifrons*). Morelos, México.

which the bird enters. The eggs have a white base color heavily marked around the larger end with reddish spots and streaks. They average  $19 \times 14$  mm.

*Tangavius aeneus*. Red-eyed Cowbird. These birds were well distributed in the lowlands up to an elevation of about 7000 feet, and they were much more abundant than the Brown-headed Cowbird. Since detailed accounts of parasitism by this and the Brown-headed Cowbird are mentioned under the species that are parasitized, only a list of those species is given here: *Thryothorus pleurostictus*, *Catharus aurantirostris*, *Vireo flavoviridis*, *Basileuterus rufifrons*, *Icterus pustulatus*, *Piranga flava*, *Amaurospiza concolor*, *Melospiza kieneri*, *Aimophila humeralis*, *A. ruficauda*, *A. rufescens*.

*Molothrus ater*. Brown-headed Cowbird. Only two eggs of this cowbird were found in the course of this study. They were in the nests of *Neochloe brevipennis* and *Melospiza kieneri*.

*Cassidix mexicanus*. Great-tailed Grackle. At Acatlipa, a nest containing four fresh eggs was taken on July 3, 1958. The nest was about thirty feet up in bald cypress (*Taxodium distichum*). These birds nest in trees along the streets of Cuernavaca where they are very abundant. Young flying about were observed from the middle of May through August.

*Icterus pustulatus*. Scarlet-headed Oriole. While many nests of this oriole were found up to the 6000-foot level, only four sets of eggs were collected. One pendent nest was placed about thirty feet up in an *Ipomoea arborescens*, about five miles east of Cuernavaca. It contained three oriole eggs and three eggs of the Red-eyed Cowbird on May 22, 1959. Scarlet-headed Orioles are abundant nesters in Morelos, using almost any kind of tree as a host. Shrubs or trees from eight to forty feet high were used. On several occasions, nests were found suspended from electric power lines. A fully grown juvenile was collected on July 7, 1958, in Acatlipa. A set of three incubated eggs was taken here on

July 25, 1960, from a nest eight feet up in an *Ipomoea arborescens*. Two nests containing three and four fresh eggs, respectively, were found on June 11, 1961, in Cañon de Lobos.

*Agelaius phoeniceus*. Red-winged Blackbird. From July 3 to July 18, 1958, eight nests with three fresh eggs each were noted at Acatlipa in the rice fields. Here the nesting time is directly related to the development of rice stalks to which the nests are attached. Since planting and harvesting goes on continually throughout the year in this area, I believe nests can be found in many months of the year, depending on local conditions of rice culture. No natural marshlands were available for nesting.

*Piranga flava*. Hepatic Tanager. These birds were well distributed in the pinewoods above Cuernavaca, but surprisingly only one nest was located. It was placed about ten feet up at the end of a horizontally growing pine branch at the 6000-foot level. On June 15, 1958, it contained three tanager eggs and two eggs of the Red-eyed Cowbird with incubation commenced.

*Spinus psaltria*. Lesser Goldfinch. The first week of July appears to be the height of the egg laying time for this species in the Acatlipa region. Several nests were found and one set of four fresh eggs was taken from a nest placed thirty feet up in a cypress on July 3, 1958.

*Pheucticus chrysopheplus*. Yellow Grosbeak. In Cañon de Lobos a nest of this grosbeak was found on June 11, 1961. It was about thirty feet up at the outer edge of a horizontal branch of an ash tree. The nest was very loosely constructed of coarse twigs and was lined with fine rootlets. On this date, the nest contained three incubated eggs. The eggs are similar in color to those of the following species, but they average larger in size.

*Pheucticus melanocephalus*. Black-headed Grosbeak. Fledglings were observed on May 30, 1959, in the pinewoods above Cuernavaca, and recently occupied nests were found in the same area. On June 3, 1960, a nest was found in this area placed about twelve feet up in a sapling oak. It contained two eggs nearly ready to hatch.

*Sporophila torqueola*. White-collared Seedeater. A nest of this species was found on July 18, 1960, near Acatlipa. It contained four fresh eggs which were pale blue in color and unmarked. The nest was placed at the extreme end of a horizontally growing branch of a *Ficus* and was about eight feet above the running water of a creek in a small canyon. The nest was neatly cupped and lined with fine fibers and a few grass stems; it was well concealed among the large leaves of the tree. The female was flushed from the nest, allowed to return to it, and then was collected for positive identification. Skutch (Pac. Coast Avif. No. 31, 1954:36-37) states that the eggs of this bird from Guatemala and Costa Rica "vary from pale blue to bluish-white or pearl-gray in ground-color and are finely mottled with light brown or chocolate, the markings usually heaviest in a wreath about the thick end but by no means absent from the remaining surface. Some eggs bear a few heavy blotches of black or deep brown in addition to the finer and lighter flecking." The apparent difference in basic coloration of eggs of this species from these two geographic regions shows the need for more study of this species from Morelos.

*Amaurospiza concolor*. Blue Seedeater. This rare finch from the southern plateau region of México was described by Griscom (Bull. Mus. Comp. Zool., 75, 1934:412) on the basis of a single specimen taken near Chilpancingo, Guerrero, and was named *Amaurospizopsis relictus*. Since that time, eight more specimens have been recorded from Guerrero and the range of this bird has been extended to Oaxaca where a specimen was taken in 1941. Orr and Ray (Condor, 47, 1945:225-228) comment critically on the genus *Amaurospiza* but nothing appears to be known of the nesting habits.

On July 8, 1960, while I was walking along a cattle trail in Cañon de Lobos, a small brown finch was flushed from a nest placed about eight feet up in the forks of a slender shoot of *Lantana* in the dense understory. About a half-hour after I had carefully concealed myself under thick bushes, this finch returned to the nest without uttering a single sound. This bird, a female, was taken along with the nest and eggs and proved to be of this species. The male was not seen at this nest.

The nest is made entirely of plant material. The outside consists of coarse grasses securely woven around the forks of the branch, and the cup is lined with fine grasses and fibers. The external diameter is 80 mm., and the greatest depth is 55 mm. The cup measures 50 mm. in diameter and is 40 mm. in depth.

The nest contained one egg of the Red-eyed Cowbird in addition to two slightly incubated eggs of the seedeater. The latter are unmarked and are pale blue in color. They measure 19×14 and 18.5×14 mm.

On June 11, 1961, while working up a small side ravine in this same area, I was attracted by an excited and repeated call which sounded like *chiüüp chiüüp* with the accent on the *ip*. The bird giving this call proved to be a male Blue Seedeater which had located a Wood Owl (*Ciccaba virgata*) in the very thick understory on the steep side of the ravine. During the day, three males and one female of this seedeater were observed feeding on bunches of dried seeds of a climbing vine in a similar manner to that of goldfinches. One seedeater consumed a large winged insect caught among the leaves of the understory. The song of the males resembled a very weak version of the liquid ramblings of a goldfinch, but the clarity of notes was closer to that of a Lazuli Bunting (*Passerina amoena*). The female remained completely silent at all times. Repeated visits were made to this place but no other individ-



Fig. 8. Nest of Blue Seedeater (*Amaurospiza concolor*) containing two eggs of the seedeater and one of the Red-eyed Cowbird. Cañon de Lobos, Morelos, México, July 8, 1960.

uals were seen or heard. Cañon de Lobos is some 150 miles north of Chilpancingo, the type locality, and extends the known range of *Amaurospiza* to Morelos.

*Atlapetes pileatus*. Rufous-capped Atlapetes. This species is extremely shy around its nest. A nest containing two eggs was located on May 24, 1959, in a bunch of thick high grass about two feet above ground at the bottom of a small ravine approximately 8000 feet up in the pinewoods association above Cuernavaca. Several attempts were made to collect the female of this nest and each was unsuccessful. When we approached the nest, the female would quietly slip off and escape through the thick undergrowth. Several waits of over an hour each at the nest site were made and even when we were well concealed in the undergrowth, we could not see or hear the bird. It was unbelievable that the eggs could remain uncovered for such long periods without injury to the embryos, but after a few frustrating days, we decided to collect the eggs, as incubation was advancing rapidly.

Two fresh eggs of the Russet Nightingale-thrush were substituted for the finch eggs as an experiment to determine if this shy nester would recognize the change. The sizes of the eggs were similar but the blue coloration was much more intense in the eggs of the substituted species. Three days later we returned and found the female incubating the thrush eggs so no attempt was made to collect her. When sufficient time had elapsed in our estimation for these eggs to be hatched, we returned again only to find the nest deserted. The thrush eggs were examined and found to contain embryos a day or so from hatching age. We feel that had we substituted eggs of a period of incubation similar to that of the host species instead of the fresh ones, an interesting and successful foster-rearing might have occurred. Apparently the period of total incubation was too long and desertion took place.

*Atlapetes virenticeps*. Green-striped Atlapetes. Eight nests of this species were found at the 8500-foot level in the pinewoods association above Cuernavaca. All were placed from three to five feet up in thick bushes. The eggs are a very pale bluish white and are unmarked. The measurements of one set are  $26 \times 17$  and  $25 \times 17.5$  mm.

The well concealed nests are substantially built of grasses, dried leaves, and pine needles on the outside. They are fairly deeply cupped and lined with cattle hair and fine rootlets. No vocalizing of any kind was heard when the females were flushed from the nests and the males did not appear around the nest sites during any of these observations.

Upon returning to a nest after having been flushed from it, the female would quietly slip back



Fig. 9. Nest and eggs of the Rufous-capped Atlapetes (*Atlapetes pileatus*). This nest was found on May 24, 1959, about ten miles above Cuernavaca, Morelos, México, in the pinewoods association.

on the ground until directly under the bush containing the nest. She would remain there silently for several minutes and then would jump up quickly through the bush directly to the nest and settle on the eggs without further delay.

The data are as follows:

Date	Number of eggs	Incubation
April 27, 1959	1	Fresh
May 6, 1959	2	Slight
May 10, 1959	2	Slight
May 21, 1960	2	Slight
June 2, 1961	2	Slight
June 10, 1959	2	Fresh
June 16, 1960	2	Fresh
June 30, 1960	2	Advanced

*Pipilo erythrophthalmus*. Rufous-sided Towhee. In the same pinewoods association as the preceding species, 11 nests were found placed from three to five feet above the ground in thick bushes. None was found on the ground as are those of the northern representatives of this species. I think the heavy rainfall may be a factor governing the placing of nests in bushes in Morelos. While I have listed these towhees from the mountains of Morelos as *erythrophthalmus*, all of the specimens taken

intergrade with *P. ocai* (cf. Sibley, Univ. Calif. Publ. Zool., 50, 1950:109-194) and no pure strains of either species were collected. The eggs bear markings identical to the eggs of *P. erythrophthalmus* from the United States. The data are as follows:

Date	Number of eggs	Incubation
April 27, 1959	2	Fresh
April 27, 1959	2	Fresh
April 30, 1959	2	Fresh
April 30, 1959	2	Fresh
May 2, 1959	2	Fresh
May 2, 1959	2	Fresh
May 6, 1959	3	Slight
May 31, 1960	2	Slight
June 16, 1960	2	Fresh
June 22, 1961	2	Slight
June 30, 1960	2	Advanced



Fig. 10. Nest and eggs of the Green-striped Atlapetes (*Atlapetes virenticeps*) located at an elevation of 8500 feet in the pinewoods above Cuernavaca, Morelos, México, June 16, 1960.

*Melospiza kieneri*. Rusty-crowned Ground Sparrow. I found this species to be the most abundant of the resident sparrows in Morelos. Eleven nests were found containing eggs which were usually pale bluish white and unmarked, although occasionally one egg of a set had a very few unpatterned reddish dots. All of the nests were placed from three to six feet up either in a small sapling tree or thick bush. Characteristically, many dried leaves were used as a foundation for the nest and dried grass stems as long as eighteen inches hung down on the outside of the nest. The nests were neatly cupped and lined with fine grasses and cattle hair.

Nests of this sparrow seem to be particularly vulnerable to parasitization by both species of cowbirds but especially by the Red-eyed Cowbird. Nine of the eleven nests contained eggs of the Red-eyed Cowbird and one nest contained an egg of each species of cowbird. Another contained four eggs of the Red-eyed Cowbird and none of the sparrow. The eggs were apparently from four different



individuals as they were all different in shape, size, and basic color. The maximum in parasitization was the nest found on July 10, 1960, which contained five eggs of the Red-eyed Cowbird and none of the sparrow. The data are as follows:

Date	Number of eggs	Incubation	Locality
June 16, 1959	2 (1 Red-eyed Cowbird)	Fresh	Cañon de Lobos
June 20, 1959	2 (1 Red-eyed Cowbird)	Slight	5 mi. east of Cuernavaca
June 27, 1960	4 (2 Red-eyed Cowbird)	Well advanced	Cañon de Lobos
July 2, 1960	4 (All of Red-eyed Cowbird)	Hatching	5 mi. east of Cuernavaca
July 2, 1960	3	Fresh	5 mi. east of Cuernavaca
July 8, 1960	4 (2 Red-eyed Cowbird)	Slight	Cañon de Lobos
July 8, 1960	3 (1 Red-eyed Cowbird) (1 Brown-headed Cowbird)	Slight	Cañon de Lobos
July 8, 1960	3 (1 Red-eyed Cowbird)	Slight	Cañon de Lobos
July 10, 1960	5 (All of Red-eyed Cowbird)	Pipped	5 mi. east of Cuernavaca
July 15, 1960	3	Slight	Cañon de Lobos
July 18, 1960	2 (1 Red-eyed Cowbird)	Slight	Acatlipa

The three eggs of one of the unparasitized sets taken measure  $22.5 \times 16$ ,  $22 \times 16$ , and  $23 \times 16.5$  mm.



Fig. 11. Nest of the Rusty-crowned Ground Sparrow (*Melospiza kieneri*) containing two eggs of the sparrow and two of the Red-eyed Cowbird. Cañon de Lobos, Morelos, México, June 27, 1960.

*Aimophila humeralis*. Black-chested Sparrow. Near Acatlipa on July 25, 1960, two nests of this bird were found when females flushed from their nests while I was walking up a small ravine. One nest was about a foot from the ground, and the other was about six inches from the ground. Both nests were in thick weed growth and were made of fine grasses on the outside and lined with fine



Fig. 12. Nest of the Black-chested Sparrow (*Aimophila humeralis*) containing three eggs of the sparrow and one of the Red-eyed Cowbird. The nest was located six inches from the ground in a tangle of weeds near Acatlipa, Morelos, México, July 25, 1960.



Fig. 13. Nest and eggs of the Rusty Sparrow (*Aimophila rufescens*) located five miles east of Cuernavaca, Morelos, México, June 14, 1961. The nest was covered with dead twigs which were removed when the photograph was taken.

grasses and cattle hair. One nest contained three fresh eggs which measure  $20 \times 16$ ,  $21 \times 16$ , and  $21 \times 16.5$  mm.; the other nest held four slightly incubated eggs, one of which was that of a Red-eyed Cowbird. The eggs are unmarked and pale bluish white in color. One nest has an external diameter of 115 mm. The cup measures 60 mm. in diameter and 37 mm. in depth.

*Aimophila ruficauda*. Russet-tailed Sparrow. In the same area where the preceding species was found, I located three nests of the Russet-tailed Sparrow. The nests were similar to those of the previous species, but they were larger and more bulky exteriorly. The nests were placed from three to five feet up in mesquite bushes. On July 18, 1960, one nest contained four eggs, slightly incubated; on July 22, 1960, another nest contained three eggs, slightly incubated; and on July 25, 1960, another nest contained four eggs, slightly incubated, one egg being that of a Red-eyed Cowbird. The eggs are unmarked and pale bluish white in color. One set measures  $21 \times 15$ ,  $20.5 \times 16$ , and  $20.5 \times 16$  mm. The females of this and the preceding species were immediately joined by the males upon being flushed from the nests, and both adults set up violent chirpings from the thick understory, but they carefully remained out of my sight.

*Aimophila rufescens*. Rusty Sparrow. Eight nests were found five miles east of Cuernavaca at an elevation of about 6000 feet. Five nests were placed on the ground, well concealed in grasses and usually in a tangle of dead brush limbs. One, however, was nestled under a covering of pine needles well away from any other protective covering. The other three nests were placed in bushes up to eight feet above ground. The five nests on the ground were located on May 15, 1959, June 2, 1959, June 7, 1958, June 14, 1961, and June 17, 1958. The three nests placed in bushes were discovered on July 1 and 2, 1958. The eggs of two sets found on July 1, 1958, measure  $27 \times 19$ ,  $27 \times 18.5$ , and  $27.5 \times 19.5$ ,  $28.5 \times 19$  mm. They are unmarked and very pale bluish white in color. Unlike *A. humeralis* and *A. ruficauda*, this species was silent upon being flushed from the nest and disappeared in the understory without a sound. I usually had to wait at least a half-hour before the female would return to the nest area. She never made any vocal protests.

I feel certain there is a direct relation between the nests being placed in bushes by the first of July and the advent of the rainy season which normally is in full force in Morelos by this date.

The data are as follows:

Date	Number of eggs	Incubation
May 15, 1959	2	Fresh
June 2, 1959	2	Slight
June 7, 1958	3	Slight
June 14, 1961	2	Advanced
June 17, 1958	2	Slight
July 1, 1958	2	Fresh
July 1, 1958	2	Fresh
July 2, 1958	2 (1 Red-eyed Cowbird) *	Slight

*Junco phaeonotus*. Mexican Junco. On May 25, 1959, a female was flushed from a nest on the ground. The nest contained two incubated eggs and was in the pinewoods region ten miles above Cuernavaca at 8500 feet elevation. Juveniles were seen flying about on May 24, 1959, and in this same area on June 6, 1960, a nest was found recessed in pine needles on the side of a small ravine. It contained two slightly incubated eggs which are pale blue and unmarked. Another nest was found here on June 2, 1961. It contained three slightly incubated eggs which are also pale blue and unmarked.

*Spizella passerina*. Chipping Sparrow. A nest was located eight feet up in a thorn bush five miles east of Cuernavaca on June 9, 1959. It contained two eggs ready to hatch. In the same vicinity on June 17, 1958, a juvenile flying about was collected. The elevation in this area is about 6000 feet.

The following species are known to breed in Morelos either because adults have been observed feeding juveniles or because a fully formed egg has been discovered in the oviduct of a female collected. No nests have been examined.

*Aphelocoma ultramarina*. Mexican Jay. Observed feeding a juvenile on May 6, 1959, in pine-woods above Cuernavaca.

*Sitta carolinensis*. White-breasted Nuthatch. Seen feeding a juvenile on May 19, 1959, in pine-woods above Cuernavaca.

*Turdus migratorius*. American Robin. Seen feeding a juvenile on May 25, 1959, in pinewoods above Cuernavaca.

*Euthlypis lachrymosa*. Fan-tailed Warbler. A fully formed egg was found in the oviduct of a female taken on June 19, 1961, in Cañon de Lobos.

*Passer domesticus*. House Sparrow. This species was nesting abundantly in tile roofs of houses in Cuernavaca from April 15 to August 15, 1958.

*Volatinia jacarina*. Blue-black Grassquit. A fully formed egg was found in the oviduct of a female taken in Acatlipa on July 18, 1958.

#### DISCUSSION

Incubating females of many species appeared to be able to remain away from their nests for relatively long periods of time without injury to embryos in the eggs. This seemed to be true throughout the area of study, from the lower elevations up to the 9000-foot level. Females of *Catharus*, *Atlapetes*, and *Melospiza* that were flushed from nests did not return to them for from thirty minutes to one hour. I believe that these long absences were made possible because of the relatively high daily temperature which remains constant during the nesting season. The daily rains may maintain the proper degree of humidity for the incubated eggs to remain in good condition.

There are few dead trees or dead limbs on living trees in the study area. In this region the dead trees are cut down and used either as firewood or for the preparation of charcoal. Consequently certain hole nesting species have adapted to this situation and have chosen other nest sites. The House Wren, for instance, nests in clumps of pine needles and in gopher holes in dirt banks.

Certain areas in Cañon de Lobos which were heavily wooded in 1959 are now almost denuded of trees and shrubs. This will no doubt have a definite effect on local populations of birds.

#### SUMMARY

A total of ten months, from April through August, was spent in the field in the State of Morelos, México, from 1958 to 1961. During this time sixty-seven species of birds were recorded and their nests were observed and described. Eight additional species are known to breed in the area either because adults were seen feeding young or because fully formed eggs were found in oviducts of collected females. Two species of cowbirds have also been included in the list of species. Thus a total of seventy-five species is known to nest in the region covered by this report.

The nests and eggs of the following species have been discovered apparently for the first time in the course of this field work: Yellow-crowned Elaenia (*Myiopagus viridicata*), Golden Vireo (*Vireo hypochryseus*), Slaty Vireo (*Neochloe brevipennis*), Blue Seedeater (*Amaurospiza concolor*), Green-striped Atlapetes (*Atlapetes virenticeps*), Black-chested Sparrow (*Aimophila humeralis*), and Rusty Sparrow (*Aimophila rufescens*).

*San Mateo, California, November 27, 1961.*