

THE AVIFAUNA OF THE BARRANCA DE OBLATOS, JALISCO, MEXICO

By ROBERT K. SELANDER and DONALD R. GILLER

Near the southwestern edge of the Mexican plateau in Jalisco, the Río Grande de Santiago leaves Lago de Chapala and flows in a northwesterly direction across the plateau and the southern tip of the Sierra Madre Occidental northwest of Guadalajara. A series of deep, narrow barrancas has been formed by this river and its larger tributaries, the rios Verde, Juchipila, Bolaños, and Guaynamota, in which lowland tropical floral and faunal elements penetrate far inland from the Pacific coastal plain of Nayarit (fig. 1). North of Guadalajara the cañon of the Río Grande de Santiago is known as the Barranca de Oblatos or Barranca de Ibarra (fig. 2). The floor of the cañon at this point lies at an elevation of about 3000 feet, which is about 2000 feet below the level of the surrounding plateau.

This is a report on the avifauna of the Barranca de Oblatos, based on collections made by us in June and July, 1958, and augmented by collections and records of E. W. Nelson, E. A. Goldman, and P. L. Jouy made in 1892.

On their first expedition to México in 1892, Nelson and Goldman camped in the barranca from May 12 to 15. They also collected from May 16 to 31 at Atemajac, "a village at about 4,500 feet altitude 3 miles north of Guadalajara on the rim of a short side canyon leading down into the main canyon of the Río Grande de Santiago" (Goldman, 1951:169-170). Their collections, as catalogued in the United States National Museum, include 30 specimens of 22 species from the barranca and 12 specimens of 10 species from Atemajac. Nelson's unpublished field notes include a list of species recorded in the barranca and a brief description of the physiography and vegetation of the barranca.

In March, April, and May of the same year, Jouy visited the barranca several times from his headquarters at Guadalajara, collecting 27 specimens of 22 species, including material on which he based his description of *Catharus melpomene* [= *aurantiirostris*] *clarus* (Jouy, 1893). Jouy's list of birds collected in México in 1891 and 1892 includes mention of 25 species collected or observed by him in the barranca.

The Barranca de Oblatos is reached from Guadalajara by driving three miles northwest to Zapopan and continuing north-northeast on a poor dirt road which soon enters a shallow east-west canyon about three miles long leading to the rim of the barranca. The road then winds down steep slopes to the settlement of Paso de Guadalupe on the Río Grande de Santiago, approximately 10 miles north of Guadalajara. In the dry season, buses and trucks ford the river at Paso de Guadalupe and continue on to Ixtlahuacán and other small settlements on the east side of the barranca. In the rainy season, the river cannot be crossed by vehicles; but there is bus service between Paso de Guadalupe and Guadalajara, and trucks come from Guadalajara to load mangos.

On June 17 we camped along the road in a small cañon leading to the barranca, at a point five miles northeast of Zapopan or about two miles from the edge of the barranca. Ecologic relationships between *Centurus aurifrons* and *Centurus uropygialis* were studied there through June 18, but a few specimens of other species were taken and some observations recorded. On June 19 we drove to Paso de Guadalupe and hunted for one hour, taking only a specimen of *C. uropygialis*. On July 3 we returned to Paso de Guadalupe and collected through July 9. We left the barranca on July 10. Our collection consists of 232 skins from the barranca and 24 skins from five miles northeast of Zapopan. The majority of our specimens has been deposited in the Museum of Verte-

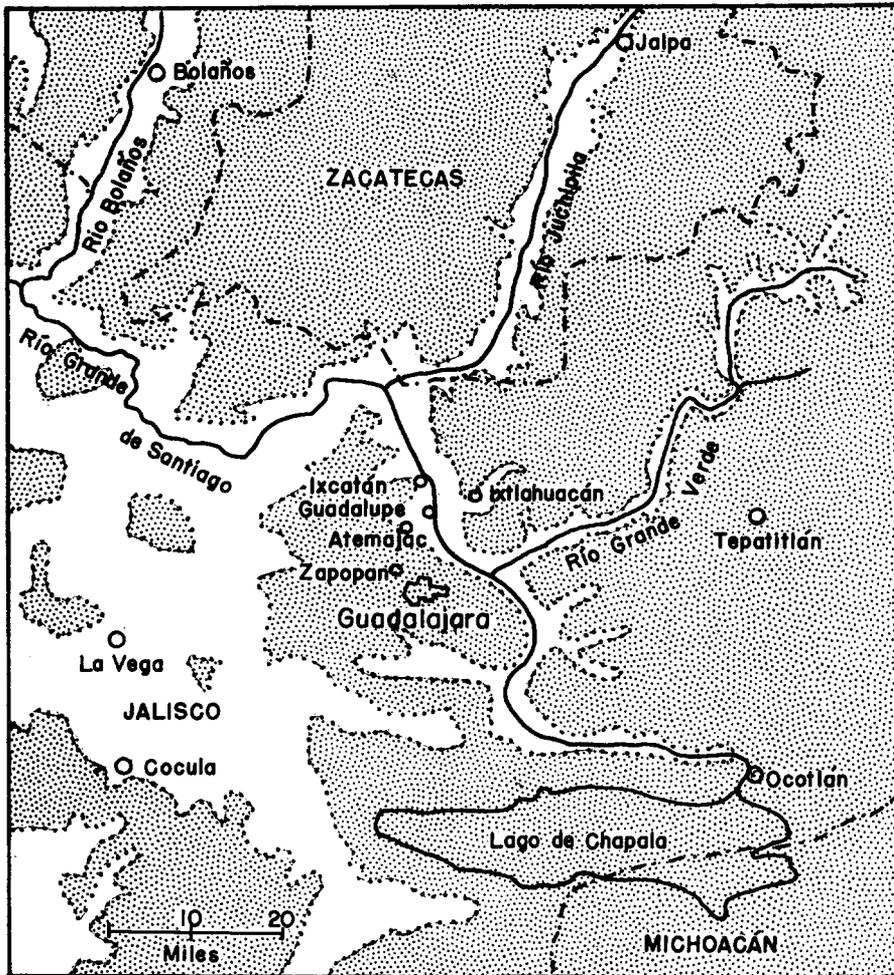


Fig. 1. Map of the Guadalajara region showing localities mentioned in the text. Shaded areas are 5000 or more feet in elevation. Ixcatán and Guadalupe are settlements in the Barranca de Oblatos.

brate Zoology, but some are in the Peabody Museum and some in the Texas Natural History Collection. Nelson's, Goldman's, and Jouy's specimens are in the United States National Museum.

Nelson's field notes do not indicate precisely where he and Goldman collected in the barranca, but Goldman (1951:170) mentions descending the trail from Guadalajara into the barranca "to a ford near which we found quarters at the Hacienda Ibarra." Nelson (MS) noted that the Hacienda was "at the fording place." We therefore assume that Paso de Guadalupe is equivalent to, or at least very near, the old Hacienda Ibarra. Nelson and Goldman may well have hunted over much of the area that we covered in our collecting. Goldman's description of the location of Atemajac indicates that it may have been the settlement five miles northeast of Zapopan near which we camped.

VEGETATION TYPES

The variety of different vegetation types in the barranca is not great, a fact which is reflected in the relatively small number of species of birds recorded. At Paso de Guadalupe there are narrow stands of riparian vegetation in which bald cypress (*Taxodium distichum*), fig (*Ficus* sp.), and willow (*Salix nigra*) trees are dominant (figs. 2 and 3). Most of the flood plain, which is about 200 yards wide on either side of the river, is in cultivation. But along irrigation ditches at the base of the sides of the barranca there are mixed stands of guamúchiles (*Pithecolobium*), *Acacia*, and *Bursera*, with a heavy shrub and herbaceous understory. Small stands of candelabra cactus also occur here. There are several mango orchards along the river, the largest of which is at the settlement of Las Animas, approximately one mile up the river from Paso de Guadalupe. We hunted there on July 6 and visited another mango orchard adjacent to a small stream ("Clear Creek") which enters the river about one-half mile below Paso de Guadalupe.

On the steep sides of the barranca there are extensive areas of grassland, with woody vegetation being for the most part confined to draws; *Bursera sessiflora* and *B. bipinnata* are dominant elements (fig. 4). We worked briefly in several draws above camp, but most of our collecting was confined to the flood plain.

On July 8 and 9 we spent several hours in the vicinity of Ixcatán, a small town in a valley about halfway up the side of the barranca and about three miles northwest of Paso de Guadalupe. Most of the valley is under cultivation but collecting was fairly good in wooded arroyos and in a small banana-coffee grove along the road about one-half mile from the town.

Nelson's description of the vegetation of the barranca in 1892 does not differ significantly from ours. He notes, however, that "over the narrow strips of comparatively level land along the river and the steep slopes of talus thence up in many places to the very foot of the cliff extends a luxuriant growth of bananas, giving a tropical luxuriance to the scene . . ." At the present time there are few banana trees in the barranca, and these are most frequent in mesic situations in arroyos on the side of the barranca. Nelson refers to mango orchards and irrigation ditches, which apparently have remained essentially unchanged.

At our camp five miles northeast of Zapopan, we collected in a grove of giant pecan trees and in willows, mangos, and a few figs along a small stream. The area surrounding the narrow flood plain of this stream is covered with typical plateau vegetation consisting of cacti, acacias, agaves, and other xeric plants.

ACKNOWLEDGMENTS

This study was supported by a research grant from the National Science Foundation. We are indebted to S. P. Young and R. H. Manville for permission to examine the unpublished field notes of E. W. Nelson, and to H. G. Deignan and H. Friedmann for permission to examine specimens from the barranca in the United States National Museum. In the field, we had the assistance of Mr. Ariel Thomann, to whom we express our thanks. Permits to collect specimens in México were obtained through the courtesy of Ing. Juan Lozano Franco, Departamento de Recursos Forestales y de Caza, México, D. F.

SPECIES LIST

In the following species accounts, an asterisk precedes the names of those species which were not reported from the barranca by Jouy (1893) or Nelson (MS). Where Nelson's comments on the relative abundance of a species disagree with our findings,



Fig. 2. The Barranca de Oblatos viewed from the road above Paso de Guadalupe.

special note is made. Unless otherwise indicated, specimens listed were taken by us in the barranca within one mile of Paso de Guadalupe or at Ixcatán. Records from five miles northeast of Zapopan and Atemajac, on the rim of the barranca, have been included. Except as noted, specimens taken by us were not molting.

Because we have not had an opportunity to compare the barranca material with that from surrounding areas, we have avoided the use of trinomials.

**Coragyps atratus*. Black Vulture. On July 3 a group of 12 circled high over the river, and a few were noted each day thereafter. This species outnumbered the Turkey Vulture, with which it was usually associated.

Cathartes aura. Turkey Vulture. One or two seen almost daily with Black Vultures.

Polyborus cheriway. Caracara. Nelson reported that this species was "common" in the barranca, but we did not record it.

**Colinus virginianus*. Bobwhite. The Bobwhite occurred on grassy slopes of the barranca. Two flew from a riparian situation and crossed the river on June 19; a single bird was flushed on a hillside above camp on July 5; a covey of 5 was seen near the same spot on July 7; and on July 9 we collected a male on the road a few hundred yards up from camp. Both Jouy and Nelson found this species in the neighborhood of Guadalajara in 1892, but neither reported it from the barranca. ♂, July 9, testis 16 mm., 149 gm.

Zenaida asiatica. White-winged Dove. This dove was decidedly uncommon in the barranca. A pair was seen on July 3 on a road near the river; a pair flew into trees at camp on July 4; one was seen in a large bald cypress above camp on July 6; and a lone bird was found at Ixcatán on July 9.

Scardafella inca. Inca Dove. Common in open riparian situations, along roads and trails, in fields, in mango groves, and at Ixcatán; usually in pairs. ♂, July 3, testis 4 mm., 40 gm.; ♀ juv., July 6, 28.7 gm.

**Columbigallina passerina*. Ground Dove. This dove was outnumbered 50 to 1 by the Inca Dove. A pair was seen almost daily on a scrub flat below camp, a few were noted at Ixcatán on July 9, and two were collected on the road above camp, where they were feeding with *Scardafella*. 2 ♂♂, July 8, testes 8 mm., 38 and 42 gm., respectively.

**Leptotila verreauxi*. White-fronted Dove. Rare. One was seen in Clear Creek canyon and another on an ox-cart road on a flat by the river on July 7, and a juvenile was noted at the edge of a riparian stand on July 8.

**Forpus cyanopygius*. Mexican Parrotlet. Single individuals or pairs of this small parrot flew over riparian vegetation near camp once or twice daily. Occasionally they alighted in the tops of tall trees, but they never remained perched in one place for more than a few seconds; in flight they are remarkably fast.

**Coccyzus minor*. Mangrove Cuckoo. A lone individual of this species was seen at close range in a dense riparian stand of figs, guamúchiles, and bald cypresses on June 19. It is rare, as we did not find it in our later field work from July 3 to 10. This little-known cuckoo is infrequently found in the

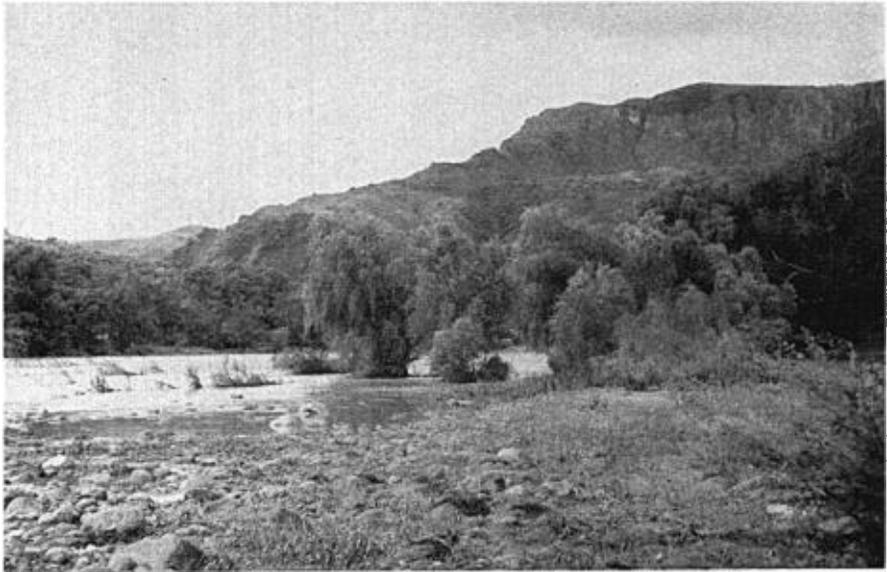


Fig. 3. Willows and other riparian vegetation along the Río Grande de Santiago at Paso de Guadalupe.

interior, and there apparently are no previous records of it for Jalisco. However, it has been collected 3 miles east of Tepic, Nayarit, at an elevation of 3000 feet, and at 4000 feet in interior Guerrero at Chilpancingo (Mexican Check-list, 1950:133).

Piaya cayana. Squirrel Cuckoo. We found this species twice, on July 7, when one was collected at the edge of a grove of trees in an arroyo on a steep hillside and another was taken in a dense riparian stand. ♂, July 7, testis 7 mm., 103 gm.; ♀, July 7, laying, brood patch, 112 gm.; ♀, April 20 (Jouy).

Crotophaga sulcirostris. Groove-billed Ani. These birds were fairly common in riparian stands and in adjacent fields. They occurred in pairs until July 9, when we first noted them in small groups. A few were seen at Ixcatán but not elsewhere on the side of the barranca. The stomach of one female contained grasshoppers. ♀, July 3, ova to 3 mm., brood patch, 76 gm.; ♀, July 6, ova to 3 mm., brood patch, 71 gm.; ♀, July 7, laying, 69 gm.

Geococcyx velox. Lesser Road-runner. Noted twice, on July 3 and 8, crossing the road near the floor of the barranca. Residents of Paso de Guadalupe said that these birds were frequently seen on grassy slopes along the road to Ixcatán. ♂, July 8, testis 8 mm., 203 gm. The specimen was in an early stage of molt, and the tarsal scutes were being replaced.

Tyto alba. Barn Owl. This species was found "sparingly" by Nelson, but it was not recorded by us.

Bubo virginianus. Great Horned Owl. This owl was found "sparingly" in the barranca by Nelson, but he did not collect it and we did not record it.

Ciccaba virgata. Squamulated Owl. A male was obtained by Nelson at Atemajac on May 28. This owl is not included in Nelson's list of species from the barranca and we did not record it.

Glaucidium brasilianum. Streaked Pygmy Owl. Nelson reports finding "a few" in the barranca. We did not record it.

Chordeiles acutipennis. Trilling Nighthawk. A "few" were noted by Nelson in the barranca, and he collected a female at Atemajac on May 28. It apparently is rare in the barranca, since we failed to find it.

**Cypseloides niger*. Black Swift. A lone swift, presumably of this species, flew over the river at 7:30 p.m. on July 6, and about 20 were feeding high over the river before a rain storm in the late afternoon on July 7 and 8. Ten Black Swifts were also seen flying before a storm-front at the upper edge of the barranca on July 10. The Mexican Check-list cites no records of this species for Jalisco. A male collected on July 8 weighed 39.8 gm. No right gonad could be found in this individual, but the left testis was apparently normal and measured 10 mm. in length.

Cyananthus latirostris. Broad-billed Hummingbird. Common everywhere in the barranca from wooded draws at Ixcátán to riparian stands at Paso de Guadalupe. One male and one female were in early postnuptial molt; the other specimens are in worn plumage. ♂, July 4, testis 2 mm., 3.4 gm.; ♂, July 6, testis 2½ mm., 3.5 gm.; ♂, July 7, testis 2 mm., 2.9 gm., molting; ♀, July 4, ovary active, 3.4 gm.; sex? (♀), July 4, 3.9 gm.; sex? (♀), July 5, 3.6 gm.; ♀, July 8, 3.2 gm., molting; ♂, date not indicated (Jouy); ♂, May 13 (Nelson); ♀, June 1 at Atemajac (Nelson).

Amazilia violiceps. Violet-crowned Hummingbird. This hummingbird was only slightly less common than *Cyananthus latirostris* and was found at all localities where the latter was taken. At Ixcátán on July 9, hundreds of individuals of these species were feeding on red-flowered trees. Their feeding was interrupted by very frequent intra- and inter-specific chases and fights. This species invariably dominated the other, chasing it from flowers. In life the base of the bill in this bird is red. All but one specimen (♂, July 4, 6.1 gm.) are in fresh plumage and apparently had completed the fall molt. The exceptional individual is about halfway through the molt. ♂, July 3, testis 1 mm., 5.5 gm.; ♂, July 4, 6.1 gm.; ♂, July 5, testis 3 mm., 5.9 gm.; ♀, July 8, ovary inactive, fat, 5.6 gm.; ♂, March 10 (Jouy); ♂, May 13 (Nelson); ♂, June 18, testis 2½ mm., 6.5 gm., 5 mi. NE Zapopan.

Lampornis clemenciae. Blue-throated Hummingbird. According to Nelson, this highland species was "common in dense strips of trees and bushes where some water came down the steep hillside, not seen elsewhere." It was not found by us in the barranca.

Trogon elegans. Coppery-tailed Trogon. Jouy noted that this species, reported by him as *Trogon ambiguus*, was "occasionally seen at the Barranca Ibarra." Nelson noted that it was "rather common in places, seeking localities where the trees afford a shelter in dense foliage from which its rather mournful note can be heard for hours." We did not find it, but perhaps it occurs on the rim of the barranca in pine woods or deciduous forest types, which we did not investigate.

**Trogon* sp. Giller saw a yellow-bellied trogon in riparian vegetation on July 9. It probably represented *T. citreolus*, as no other yellow-bellied species is known from western México.

Chloroceryle americana. Little Green Kingfisher. Two were present at the edge of a temporary rain pool in the riparian association on July 8, and a juvenal male (weight, 32 gm.) was collected as it flew down river on July 9. Nelson collected a male at Atemajac on June 1.

Momotus mexicanus. Rufous-crowned Motmot. This species was uncommon in the barranca. One was collected at the head of a small, dark arroyo as it perched on a shrub beneath a giant fig tree; two were seen in a similar situation on Clear Creek; and one was taken in an arroyo at Ixcátán. ♂, July 6, testis 4 mm., 68 gm.; ♂ jv., July 7, testis 3 mm., 71 gm.; ♀, July 8, ova to 1 mm., brood patch, 68 gm. Postjuvénal molt was almost complete in the male taken on July 7. Its bill is only about two-thirds adult size and lacks the conspicuous serrations of adult birds. The two adult specimens are in worn plumage, showing no molt.

Centurus uropygialis. Gila Woodpecker. Moderately common in riparian stands, dead trees bordering mango orchards, and in candelabra cactus at Ixcátán. The adult specimens in our series are in postnuptial molt. ♂, July 8, testis 2 mm., 72 gm.; 5 ♂ jv., July 5-9, mean weight, 65.0 gm. (range, 61-69 gm.); ♀, July 4, 51 gm.; ♀, July 9, 64 gm.; ♀ jv., June 19, 50 gm.; ♀ jv., July 5, 54 gm.; ♀ jv., July 5, 55 gm.; ♂, May 14 (Jouy); ♂, May 13 (Nelson). The following specimens were taken 5 mi. NE Zapopan, June 17-19: ♂, June 18, testis 5 mm., brood patch, 67 gm.; ♂, June 18,



Fig. 4. A wooded arroyo along the road about 1000 feet above Paso de Guadalupe.

testis 6 mm., brood patch, 60 gm.; ♂, June 18, testis 7 mm., feathers growing in on old brood patch, 70 gm.; ♂, June 18, testis 3 mm., molting, 77 gm.; ♂, June 19, testis 4 mm., feathers growing in on brood patch, 75 gm.; ♂ jv., June 17, 63 gm.; ♂ jv., June 18, 65 gm.; ♂ jv., June 19, 53 gm.; ♀, June 17, ovary inactive, no brood patch, 59 gm.; ♀, June 18, ovary almost inactive, 57 gm.; ♀, June 18, 65 gm.; ♀, June 19, ovary inactive, molting heavily, 65 gm.; ♀ jv., June 18, 53 gm.

**Centurus aurifrons*. Golden-fronted Woodpecker. This species occurred with, but was outnumbered by, *C. uropygialis* at our camp 5 miles northeast of Zapopan, but it does not enter the barranca. ♀, June 17, ova to 3 mm., brood patch, 83 gm.; ♀, June 17, egg in oviduct, brood patch, 75 gm. Both specimens were taken 5 miles northeast of Zapopan.

Dendrocopos scalaris. Ladder-backed Woodpecker. This species was not present at the bottom of the barranca, but two were seen in widely spaced trees in an arroyo at Ixcatán on July 8. Nelson mentioned seeing "a few" in the barranca.

Platyparis aglaiae. Rose-throated Becard. Fairly common in riparian stands, where it frequented medium and upper levels; also noted in open wooded country at Ixcatán. Jouy collected a male on May 13 and noted that he did not find it elsewhere than in the barranca. Nelson noted its occurrence "among wild figs along the river."

The female in our collection has a wide, buffy nuchal collar. A male taken on July 9 is a first-year bird with retained juvenal flight feathers; apparently it was not in breeding condition, as were the adults collected. 4 (adult) ♂ ♂, July 3-7, mean testis length, 10.5 mm. (range, 10-12 mm.), mean weight, 29.78 gm. (range, 28.1-34 gm.); ♂ (first-year), July 9, testis 4 mm., 27.5 gm.; ♀, July 4, ova to 2 mm., brood patch, 30 gm.; ♂, May 13 (Jouy).

Sayornis nigricans. Black Phoebe. One to five individuals were seen daily in willows and other trees along the river, where they often perched over water; and a lone bird was seen part way up Clear Creek on July 5. Nelson referred to it as "common" in the barranca and also collected it at Atemajac. ♂, July 6, testis 2 mm., 20 gm., $\frac{3}{4}$ through postnuptial molt; ♂ jv., July 9, 18.5 gm., beginning postjuvenal molt; ♂, June 1 at Atemajac (Nelson); sex? jv., June 2 at Atemajac (Nelson).

Pyrocephalus rubinus. Vermilion Flycatcher. This was the commonest flycatcher in the barranca, occurring in large numbers along trails and field borders at the edge of riparian stands and in savanna on slopes. It was less common at Ixcatán than lower in the barranca. Breeding was in progress and

many juveniles were noted. Postnuptial molt was beginning in one adult male; all other adults were in worn breeding plumage. 4 ♂♂, July 3-7, mean testis length, 5.0 mm. (range, 2-8 mm.), mean weight, 13.82 gm. (range, 13.1-15.5 gm.); ♂ jv., July 4, testis 3 mm., 14.0 gm.; ♂ jv., July 5, 12.7 gm.; ♀, July 3, ova to 1 mm., brood patch, 13.6 gm.; ♀, July 4, ova to 1½ mm., brood patch, 15.7 gm.; ♀ jv., July 4, ovary inactive, 13.4 gm.; ♀ jv., July 7, 12.5 gm.; ♂, May 18 at Atemajac (Nelson). The adult female collected on July 3 was infected with *Sarcocystis*.

**Tyrannus melancholicus*. Tropical Kingbird. We encountered this kingbird on three occasions. Giller took one in guamúchiles about 75 yards from the river, an incubating female was collected at the edge of a mango orchard, and a male was collected as it flew across the river near camp. One female was infested with three larvae of the blow-fly *Philornis*. ♂, July 9, testis 7 mm., 39 gm., postnuptial molt beginning; ♀, July 4, ova to 1 mm., brood patch, 37 gm.; ♀, July 4, ova to ½ mm., brood patch, 37 gm.

**Tyrannus crassirostris*. Thick-billed Kingbird. Moderately common in pairs in large trees in savanna on slopes of the barranca as far up as Ixcatán; less numerous in riparian formations; noted daily July 4 to 9. On July 8, a pair was observed feeding young in a nest in the top of a tall tree in a mango grove. 4 ♂♂, July 4-8, mean testis length, 9.8 mm. (range, 7-14 mm.), mean weight, 56.0 gm. (range, 53-59 gm.); ♂ jv., July 7, 57 gm.; ♀, July 4, ova to 2 mm., brood patch, 57 gm.; ♀, July 4, ova to 1½ mm., brood patch, 57 gm.; ♀, July 8, ovary inactive, brood patch, 54 gm.

Myiodynastes luteiventris. Sulphur-bellied Flycatcher. Uncommon. Single birds were noted on July 3, 4, 5, 6, and 9 in the riparian association, at the edge of a mango orchard, or in the outskirts of Ixcatán. ♂, July 3, testis 12 mm., 45 gm.; ♂, July 4, testis 14 mm., 43 gm.; ♀, July 4, ovary inactive, 50 gm.; ♀, ova to 2 mm., 48 gm.; ♂, May 13 (Nelson); ♀, June 2 at Atemajac (Nelson). The female collected on July 4 was infected with *Sarcocystis*.

**Myiozetetes similis*. Vermilion-crowned Flycatcher. It is surprising that this flycatcher was not recorded by Nelson or Jouy. It was moderately common in the more open, drier riparian situations, but it was not seen at Ixcatán or elsewhere in the barranca. Breeding was over at the time of our study: well-grown juveniles were collected; one female was in heavy molt; and molt was started in another female and in a male. ♂, July 4, testis 10 mm., 32 gm.; ♂ jv., July 7; ♀, July 5, ova to 1 mm., 30 gm.; ♀, July 6, ova to 1 mm., 34 gm.; ♀ (jv.), July 6, 31 gm.

Pitangus sulphuratus. Kiskadee Flycatcher. Moderately common in open places in riparian stands and in the outskirts of Ixcatán, where it was usually seen with *Myiozetetes*. This species is decidedly less numerous in the barranca than at lower elevations in western México. The testes of the two adult males collected were only partly reduced from full breeding size (about 15 mm.), but both birds were molting heavily. Molt in an adult female was just beginning.

Jouy reported that this flycatcher was abundant in the outskirts of Guadalajara, but he did not list it from the barranca. Nelson, however, found it "common" there. ♂, July 5, testis 10 mm., 82 gm.; ♂, July 6, testis 10 mm., 81 gm.; ♂ jv., July 9, testis 3 mm., 76 gm.; ♂ jv., July 9, testis 3 mm., 73 gm.; ♀, July 7, ovary inactive, brood patch.

Myiarchus tyrannulus. Wied Flycatcher. Wied Flycatchers were common in riparian vegetation and were seen once, on July 5, in a wooded arroyo and in a mango orchard at Las Animas. Breeding apparently had not begun, as the adult females collected had inactive ovaries and lacked brood patches, and the testes of males were below breeding size. All birds taken were in moderately worn plumage and none was molting; no juveniles were encountered. A male from 5 miles northeast of Zapopan was in breeding condition on June 19 (testis 14 mm., 44 gm.), and this species was breeding at San Blas, Nayarit, in late June (♂, June 22, testis 10 mm., 39 gm.; ♀, June 21, ova to 4 mm., brood patch; ♀, June 21, ova to 2 mm., brood patch, 43 gm.). Data from barranca specimens are: 4 ♂♂, July 3-6, mean testis length, 5.8 mm. (range, 5-6 mm.), mean weight, 45.8 gm. (range, 44-47 gm.); ♀, July 3, ovary inactive, no brood patch, 43 gm.; ♀, July 9, ovary inactive, no brood patch, 41 gm.; ♂, May 14 (Nelson); ♀, May 15 (Nelson).

Myiarchus tuberculifer. Olivaceous Flycatcher. This small *Myiarchus* was not uncommon in savanna and field borders near Ixcatán, but it was found only once in the lower barranca, when a juvenile was taken in mangos at Las Animas. ♂, July 9, testis 4 mm., 18.6 gm.; ♂ jv., July 6, 16.5 gm.; sex?, July 8, 17.1 gm.; ♂, May 13 (Nelson); ♂, May 14 (Jouy).

Empidonax hammondi. Hammond Flycatcher. Jouy collected a migrant female of this species in the barranca on March 9.

Empidonax wrightii. Wright Flycatcher. A migrant male was collected by Jouy on March 9.

Myiopagis viridicata. Yellow-crowned Elainea. *Myiopagis* was uncommon in the barranca. Single individuals were noted in riparian stands on July 4, 5, and 9, and one was found on Clear Creek on July 8. ♂, July 8, testis 7 mm., 12.3 gm.; ♀, July 4, ova to 2 mm., brood patch, 11.5 gm. A male was collected on May 13 by Nelson, who called it "rare" in the barranca.

Petrochelidon pyrrhonota. Cliff Swallow. According to Nelson, this species was "common" in the barranca in May, 1892. We saw a flock of swallows which may have been this species flying up the river late in the afternoon, but we did not collect specimens.

Seligidopteryx ruficollis. Rough-winged Swallow. Two swallows were feeding over the river and adjacent fields on July 3 and 5, and two flocks of 20 each flew up river at 7:00 and 7:30 p.m. on July 6. These were not all definitely identified, but many and perhaps all were of this species. About 20 were feeding low along the road from Paso de Guadalupe to Ixcatán on July 9. ♂ juv., July 6, testis 1 mm., 14.3 gm.; ♂ juv., July 9, 13.5 gm.; ♀ juv., July 9, 12.5 gm.; ♂, June 2 at Atemajac (Nelson).

Hirundo rustica. Barn Swallow. Recorded as "common" in the barranca by Nelson. This is an upland species in central México and would not be expected to occur in the breeding season in the lower barranca. We did not record it.

Corvus corax. Holarctic Raven. Rare. One was chased by a *Tyrannus* near camp on July 4; one was in company with a group of vultures on July 7; and two followed a large *Buteo* over the barranca on July 9.

Calocitta colliei. Magpie-jay. On July 6 a group of four was encountered along the lower border of a tall stand of trees and cacti about $\frac{3}{4}$ mile up the river from camp, and three specimens were collected. Two more were seen in large cacti up Clear Creek. Residents of Paso de Guadalupe told us that the *urraga* is more frequently seen in the barranca in the winter than in the summer. Jouy obtained specimens on March 9 and mentioned finding this jay "in the lower sides of the barranca in small flocks of four or five." Nelson regarded it as "common." *Colliei* is treated as a race of *formosa* by Hellmayr and most recent authors, but evidence to be presented elsewhere (Selander, MS) suggests that it is specifically distinct. ♂, July 6, testis 15 mm., 235 gm.; ♀, July 6, ovary inactive, 225 gm.; ♀, July 6, ovary inactive, 223 gm.; ♀, July 7, ova to 3 mm., 251 gm. All four were molting and the females had brood patches which were being refeathered. All were in the same stage of molt, having dropped primaries 1 and 2. ♂ and ♀, March 9 (Jouy).

**Campylorhynchus gularis*. Spotted Wren. This species was not present on the floor of the barranca, but one was singing in a wooded arroyo at Ixcatán on July 8, and a pair was collected there on July 9. A pair was found nesting in a cactus-scrub stand on a slope 5 miles northeast of Zapopan on June 18, where it occurs with *Campylorhynchus brunneicapillus*. *C. gularis* is not, as has been suggested by several recent authors, conspecific with *C. jocosus* (Selander, MS). ♂, July 9, testis 7 mm., 28.3 gm.; ♀, July 9, brood patch, 31 gm.; ♂, June 18, testis 6 mm., 31 gm., 5 mi. NE Zapopan.

Campylorhynchus brunneicapillus. Cactus Wren. Seen only at our camp 5 miles northeast of Zapopan; not present in the barranca.

Thryothorus sinaloa. Sinaloa Wren. The Sinaloa Wren was one of the commoner species in the barranca, where we found it in dense riparian understory, at the borders of mango orchards, and in shrubs along irrigation ditches. It was present but less numerous in wooded arroyos on the sides of the barranca and at Ixcatán. Males sang throughout the day. One pair had a nest 8 feet up in a guamúchil at the side of a trail. 10 ♂♂, July 3-8, mean testis length, 6.9 mm. (range, 5-9 mm.), mean weight, 17.47 gm. (range, 15.7-19.0 gm.); ♂, May 13 (Nelson). An incubating female (ova to 1.5 mm., 18 gm.) was taken on June 18, 5 miles northeast of Zapopan.

Thryomanes bewickii. Bewick Wren. Nelson reports seeing "a few" in the barranca, but we did not find it. This is a plateau species in Jalisco, occurring above 3000 feet (Mexican Check-list, 1957: 160), and would not be expected in the lower parts of the barranca.

Salpinctes obsoletus. Rock Wren. In central México this wren is restricted to upland regions. Nelson took a male at Atemajac on May 19, but this species does not occur in the barranca.

Catherpes mexicanus. Canyon Wren. Seen regularly along stone walls, in rocky areas, and on

cliffs throughout the barranca. ♂, July 5, testis 4 mm., 15.5 gm.; ♂, July 6, testis 4 mm., 15.7 gm.; ♂, July 7, testis 3 mm., 15.9 gm.

Melanotis caerulescens. Blue Mockingbird. Confined to dense riparian growth, where it was moderately common in pairs in the understory. This species was extremely secretive but came well to squeaks. 6 ♂♂, July 3-9, mean testis length, 8.8 mm. (range 8-10 mm.), mean weight, 62.0 gm. (58-66 gm.); ♀, July 6, laying, 64 gm.; ♀, July 9, laying, 69 gm.; ♀ juv., July 5, 59 gm.; ♂, March 10 (Jouy); ♂, April 21 (Jouy); ♂, May 15 (Nelson).

Mimus polyglottos. Northern Mockingbird. Whereas Nelson mentions seeing "a few" individuals of this species in the barranca, we found no evidence of it there. The species occurs both on the plateau in Jalisco and at low elevations in Nayarit.

**Toxostoma curvirostre*. Curve-billed Thrasher. This species was moderately common on the slopes of the barranca, where it was associated with large cacti; occasionally individuals flew to the edge of riparian stands. The data on gonads indicate breeding. ♂, July 4, testis 13 mm., 78 gm.; ♂, July 8, testis 15 mm., 84 gm.; ♂ juv., July 7, 68 gm.; ♀, July 4, egg in oviduct, 76 gm.; ♀, July 9, laying, 74 gm.

**Turdus rufo-palliatu*s. Rufous-backed Thrush. This thrush was not reported by Jouy or Nelson, but we found it common in riparian vegetation. One was seen in a mango orchard in the same tree with *Turdus assimilis*, but possibly this individual was attracted from an adjacent riparian stand by our squeaks. Except for this instance, there was strict habitat segregation of the two species, with *T. assimilis* being found only in mangos. The two species were about equally common and both were breeding. 4 ♂♂, July 3-8, mean testis length, 13.0 mm. (range, 9-16 mm.), mean weight, 74.5 gm. (range, 72-78 gm.); 4 ♀♀, July 3-6, ova 1 to 4 mm., brood patches, mean weight, 79.0 gm. (range, 74-85 gm.).

Turdus assimilis. White-necked Thrush. ♂, July 5, testis 12 mm., 66 gm.; ♂, July 6, testis 9 mm., 73 gm.; ♀, July 5, ova to 2 mm., brood patch, 69 gm.; ♀, July 6, brood patch, 72 gm.; ♂, March 9 (Jouy); ♂, April 21 (Jouy); ♂, May 13 (Nelson). A male (testis 14 mm., 71 gm.) was collected 5 miles northeast of Zapopan on June 18.

Catharus aurantiirostris. Orange-billed Nightingale-thrush. This was one of the commoner birds in riparian stands, to which it was all but confined. Occasionally we found it feeding on the ground at the edge of mango groves where these were adjacent to riparian stands, but it was not found at Ixcatán or on the sides of the barranca. 6 ♂♂, July 3-8, mean testis length, 11.0 mm. (range, 10-12 mm.), mean weight, 27.60 gm. (range, 24.9-29.2 gm.); ♀, July 3, ova to 2 mm., brood patch, 27.4 gm.; ♀, July 8, laying, brood patch; 2 ♂♂, May 13 (Jouy); 3 ♂♂, 2 ♀♀, May 13-15 (Nelson); ♂, June 18, testis 15 mm., 28 gm., 5 mi. NE Zapopan.

Vireo hypochryseus. Golden Vireo. This Tropical Zone species was found only twice. On July 7 a male (testis 8 mm., 13.8 gm.) was collected in a tree overhanging the road to Ixcatán near a mango orchard on Clear Creek. The bird was repeatedly flitting up from its perch and returning. Another individual was seen in a wooded draw at Ixcatán on July 9. Nelson collected a male and a female on May 13 and regarded the species as "common."

Vireo flavoviridis. Yellow-green Vireo. This was the commonest species in the riparian association, to which it was almost confined. A few occurred along Clear Creek and in mango orchards adjacent to the river, but none was noted elsewhere in the barranca. These vireos mobbed us repeatedly, coming to our squeaks with rasping calls and tails conspicuously fanned. A nest with three young was found on July 3 in a guamúchil over water. From July 3 to 7, a series of 12 males and 3 females was collected; data from these specimens are as follows: 12 ♂♂, mean testis length, 8.6 mm. (range, 6-11 mm.), mean weight, 18.22 gm. (range, 17.2-19.3 gm.); 3 ♀♀, all with brood patch and ova to 2 mm., mean weight, 19.80 gm. (range, 18.6-20.5 gm.). This species is migratory, wintering in South America. Jouy found it only "tolerably common" in the barranca in May, and he collected a male on May 13. Nelson collected 2 specimens (♂ and sex?) on the same day and called the species "abundant."

Parula pitiayumi. Olive-backed Warbler. Nelson collected a male of this conspicuous warbler on May 7 and noted that it was "common" in the barranca. It is therefore surprising that we failed to find it either at 5 miles northeast of Zapopan or in the barranca.

Euthlypis lachrymosa. Fan-tailed Warbler. Although Jouy refers to the Fan-tailed Warbler as "tolerably common in the Barranca" and Nelson regarded it as "abundant," we encountered it only

three times. One was taken in understory vegetation below a giant fig tree in a rocky area at the edge of the river on July 6. Later in the day, another was seen in a similar ecologic situation 30 yards from the river, and on July 8 a pair was collected along Clear Creek at the edge of a mango grove. This bird is very shy and stays low in dense cover. ♂, July 6, testis 9 mm., 15.1 gm.; ♂, July 8, testis 8 mm., 14.8 gm.; ♀, July 8, ova to 2 mm., brood patch, 15.0 gm.; ♂, May 14 (Jouy); ♂, May 13 (Nelson); ♂, May 15 (Nelson).

Basileuterus rufifrons. Rufous-capped Warbler. One was seen on July 8 in a thicket at the head of a gully leading off Clear Creek halfway up the side of the barranca. Jouy collected a male on May 11 and Nelson took a specimen on May 12. Nelson called it "common."

**Passer domesticus*. House Sparrow. Common in clumps of guamúchiles and tuna cactus in the vicinity of houses at Paso de Guadalupe and Ixcatán. Two juveniles collected were in postjuvenile molt. ♂ juv., July 7, testis 1 mm., 26.5 gm.; ♀, July 9, laying, brood patch, 27.5 gm.; ♀ (juv.), July 4, ovary inactive, 23 gm.

Tangavius aeneus. Red-eyed Cowbird. Fairly common in riparian vegetation and in adjacent fields, and abundant in the outskirts of Ixcatán. Breeding. 5 adult ♂♂, July 4-9, mean testis length, 11.6 mm. (range, 11-13 mm.), mean weight, 59.6 gm. (range, 58-61 gm.); ♀, July 3, laying, 50 gm.; ♀, July 7, laying, 51 gm.; ♂? juv., July 8, 46 gm.; ♂, May 13 (Nelson).

Cassidix mexicanus. Boat-tailed Grackle. This very conspicuous species was noted by Nelson as "common" in the barranca in May, 1892, but it was not present in July, 1957. Residents of Paso de Guadalupe had no recollection of seeing it in the barranca.

Icterus wagleri. Wagler Oriole. Sparsely distributed throughout the barranca. A pair flew high over the river on July 3, one was taken in a banana grove near Ixcatán, and two were collected in wooded arroyos at Ixcatán on July 9. Specimens were also taken near camp on July 4 and 8. Jouy collected two adult males on April 21 and 22, and Nelson called the species "common." Our series includes two first-year females, neither of which had a brood patch or active ovary. ♂, July 9, testis 10 mm., 43 gm.; ♀, July 9, ova to 1 mm., brood patch, 42 gm.; ♀, July 9, laying, brood patch, 41 gm.; ♀, July 8, brood patch, 39 gm.; ♀ (first-year), July 4, ova to 1 mm., 41 gm.; ♀ (first-year), July 4, ova to 1 mm., 42 gm.; ♂, April 21 (Jouy); ♂, April 22 (Jouy); ♂, May 13 (Nelson); ♂, June 18, testis 15 mm., 50 gm., 5 mi. NE Zapopan.

Icterus cucullatus. Hooded Oriole. Jouy reported collecting a "young male" of this species on April 21. We did not record it.

Icterus pustulatus. Scarlet-headed Oriole. This oriole was abundant and conspicuous in a variety of habitat types from the riparian association on the floor of the barranca to wooded arroyos at Ixcatán. On the sides of the barranca it was the commonest bird. Many fledglings were seen. 5 ♂♂ adult, July 4-6, mean testis length, 8.2 mm. (range, 7-11 mm.), mean weight, 37.5 gm. (range, 35-40 gm.); ♂ (first-year), July 6, testis 4 mm., 35 gm.; 5 ♀♀, July 3-6, all with brood patch, mean weight, 35.2 mm. (range, 35-36 gm.); ♀ (juv.), July 4, 27 gm.; ♂, April 21 (Jouy); ♂, May 14 (Nelson).

Piranga flava. Hepatic Tanager. "Several specimens" seen and an adult male collected by Jouy on March 10 were probably migrants, as we did not find this species in the barranca.

Piranga bidentata. Swainson Tanager. We found this plateau species three times in the barranca. A lone male was collected in a riparian stand on July 3, and an incubating female was taken in the same area on July 4. A pair came to squeaks in a mango grove on July 8, and the male was collected. ♂, July 3, testis 8 mm., 36 gm.; ♂, July 8, testis 10 mm., 34 gm.; ♀, July 4, ova to 1 mm., brood patch, 35 gm.; ♂, May 14 (Jouy).

Carpodacus mexicanus. Common House Finch. A few were noted in wooded arroyos, in the outskirts of Ixcatán, and near houses adjacent to mango orchards. Nelson noted that it was "common." ♂, July 5, testis 7 mm., 20.6 gm.; ♀, July 3, ova to 3 mm., brood patch, 21 gm.

**Spinus psaltria*. Lesser Goldfinch. Numerous in open areas at Ixcatán and in a row of trees at the foot of the side of the barranca; noted on a riparian flat on July 6. ♂, July 5, testis 6 mm., 9.9 gm.; ♂, July 6, testis 5 mm., 9.9 gm.; ♀, July 4, ova to ½ mm., 8.1 gm. All three specimens have retained a few proximal juvenal primaries, upper greater primary coverts, and distal secondaries.

Guiraca caerulea. Blue Grosbeak. Although Nelson reported the Blue Grosbeak as "common" in the barranca, we did not find it there. Several were seen by us, however, 5 miles northeast of Zapopan on June 17.

Passerina versicolor. Varied Bunting. This species was confined to shrubby growth on dry hillsides above Paso de Guadalupe and at Ixcatán. It was not common. ♂, July 3, testis 9 mm., 14.3 gm.; ♂, July 8, testis 10 mm., 16.1 gm.; ♀, July 6, ova to 2 mm., brood patch, 15.0 gm.; ♂, March 9 (Jouy).

**Sporophila torqueola*. White-collared Seedeater. Fairly common along field borders and edges of arroyos throughout the barranca. ♂, July 3, testis 5 mm., 8.8 gm.; ♂, July 3, testis 6 mm., 10.0 gm.; ♀, July 5, laying, 10.5 gm.; ♂, June 1 at Atemajac (Nelson); ♀, June 2 at Atemajac (Nelson).

**Volatinia jacarina*. Blue-black Grassquit. This grassquit was common in shrubby field borders, in milpas, along trails, and in grassy fields. 4 ♂♂, July 3-5, mean testis length, 5.3 mm. (range, 4-6 mm.), mean weight, 8.90 gm. (range, 8.1-9.9 gm.); ♀, July 5, ova to 4 mm., 9.5 gm.; sex? (♂), June 19, 8.7 gm., 5 mi. NE Zapopan.

Melospiza kieneri. Rusty-crowned Ground Sparrow. This species was common in pairs in dense understory vegetation almost everywhere. We noted it in riparian willows, along ditches bordering fields, and in wooded arroyos. Generally it stays in dense vegetation and may go unnoticed, but it is easily attracted to squeaks or owl calls. Several times we saw it feeding on the ground beneath mango trees. Nelson noted that it was "very common on brushy hillsides." Jouy reported that "it was found almost exclusively around the head of the barranca on the bare hillsides and on the road leading down, but never descending any distance toward the warmer country." This is contrary to our experience, for we found it as common in riparian growth at Paso de Guadalupe as elsewhere in the barranca. 9 ♂♂, July 4-7, mean testis length, 9.2 mm. (range, 6-12 mm.), mean weight, 38.9 gm. (range, 35-41 gm.); ♀, July 4, laying, 40 gm.; ♀, July 7, brood patch, 36 gm.; ♂, May 11 (Jouy); ♀, May 13 (Jouy); sex?, May 13 (Nelson).

**Aimophila quinquestrata*. Five-striped Sparrow. On July 7, a pair was seen in low shrubs and herbs in a grassy area at the side of the road halfway between Paso de Guadalupe and Ixcatán.

**Aimophila ruficauda*. Russet-tailed Sparrow. This sparrow was common on the floor of the barranca in shrubs bordering fields, especially in the vicinity of cacti and agaves. A few were seen at Ixcatán, but the species was absent from hillsides and was not noted in the riparian association. 4 ♂♂, July 4-5, mean testis length, 5.5 mm. (range, 5-6 mm.), mean weight, 28.60 gm. (range, 27.2-30.0 gm.).

**Aimophila rufescens*. Rusty Sparrow. Found in small numbers in understory of clumps of small trees in dry gullies high on the side of the barranca, where it occurred with *Melospiza*. On July 8 a male alternately sang and sun-bathed about 20 feet up in a tree at the edge of an arroyo. ♂, July 7, testis 10 mm., 39 gm.; ♂, July 8, testis 10 mm., 38 gm.; ♀, July 7, laying, 35 gm.

The foregoing list provides a reasonably complete picture of the breeding avifauna of the lower parts of the Barranca de Oblatos, but additional work on the upper slopes will undoubtedly increase the number of species. There is also need for further collecting of nocturnal and crepuscular species, which we all but neglected. Some of Nelson's and Jouy's sight records, as well as our own, require confirmation.

It is apparent that the avifauna includes numerous tropical lowland species which penetrate inland from the arid coastal plain to the west, and which occur only locally, if at all, on the plateau. This element includes:

<i>Forpus cyanopygius</i>	<i>Pitangus sulphuratus</i>
<i>Coccyzus minor</i>	<i>Myiopagis viridicata</i>
<i>Crotophaga sulcirostris</i>	<i>Calocitta collieri</i>
<i>Trogon citreolus</i> ?	<i>Turdus rufo-palliatu</i> s
<i>Momotus mexicanus</i>	<i>Vireo hypochryseus</i>
<i>Centurus uropygialis</i>	<i>Vireo flavoviridis</i>
<i>Tyrannus crassirostris</i>	<i>Icterus pustulatus</i>
<i>Tyrannus melancholicus</i>	<i>Volatinia jacarina</i>
<i>Myiodynastes luteiventris</i>	<i>Aimophila ruficauda</i>

Of these 18 species, *Coccyzus*, *Trogon*, *Myiopagis*, and *Vireo hypochryseus* are rare or uncommon in the barranca; and several, including *Forpus*, *Coccyzus*, and *Calocitta*, are at, or near, their upper altitudinal limit.

Also breeding in the barranca are at least 10 species which are widely distributed on the plateau, or at low to medium elevations in the Sierra Madre, but which do not reach the arid lowlands in Nayarit. These are:

<i>Cypseloides niger</i>	<i>Icterus wagleri</i>
<i>Sayornis nigricans</i>	<i>Piranga bidentata</i>
<i>Campylorhynchus gularis</i>	<i>Carpodacus mexicanus</i>
<i>Catherpes mexicanus</i>	<i>Aimophila rufescens</i>
<i>Basileuterus rufifrons</i>	

It is noteworthy that none of the foregoing is common in the barranca and that several, including *Campylorhynchus gularis* and *Aimophila rufescens*, do not reach the floor of the barranca, being, instead, confined to slopes. Several other typical plateau species breed near Guadalajara and Atemajac but apparently do not enter the barranca. Among these are *Centurus aurifrons*, *Progne subis*, *Sturnella magna*, *Icterus bullockii*, *Lanius ludovicianus*, *Campylorhynchus brunneicapillus*, *Salpinctes obsoletus*, and *Pipilo fuscus*. *Lampornis clemenciae* and *Thryomanes bewickii* probably also show this distribution pattern.

Blake and Hanson (1942:519) list 16 species as characteristic of the Arid Tropical Zone, from 500 to 3000 feet in elevation, in the Tancitaro region of western Michoacán. Of these, 8 have been recorded in the Barranca de Oblatos. Of the 45 species in the Tancitaro region which are characteristic of the Temperate Zone, 3000 to 6000 feet, only 5 have been recorded in the barranca.

LITERATURE CITED

- Blake, E. R., and Hanson, H. C.
1942. Notes on a collection of birds from Michoacan, Mexico. Field Mus. Nat. Hist., Zool. Ser., 22, no. 9:513-551.
- Goldman, E. A.
1951. Biological investigations in México. Smiths. Misc. Coll., 115:i-xiii + 1-476.
- Jouy, P. L.
1893. Notes on birds of central Mexico, with descriptions of forms believed to be new. Proc. U. S. Nat. Mus., 16:771-791.
- Mexican Check-list
1950. Distributional check-list of the birds of Mexico. Part I. Pac. Coast Avif. No. 29:1-202.
1957. Distributional check-list of the birds of Mexico. Part II. Pac. Coast Avif. No. 33:1-435.
- Department of Zoology, University of Texas, Austin, Texas, November 6, 1958.*