

The Avifauna of the Cayerias
of Southern Cuba, with the
Ornithological Results of the
Paul Bartsch Expedition of 1930

DONALD W. BUDEN
and
STORRS L. OLSON

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ABSTRACT

Buden, Donald W., and Storrs L. Olson. The Avifauna of the Cayeries of Southern Cuba, with the Ornithological Results of the Paul Bartsch Expedition of 1930. *Smithsonian Contributions to Zoology*, number 477, 34 pages, 3 figures, 7 tables, 1989.—The systematics and distribution of the avifauna of the numerous small islands scattered along the southern coast of Cuba are analyzed and discussed using a previously unstudied collection made by Paul Bartsch in 1930 and reports in the literature. Estimates of eustatic sea-level change indicate that this avifauna is no older than mid- to late Pleistocene, as the islands were doubtless submerged during earlier Pleistocene sea-level maxima. The cays were colonized from Cuba over water gaps at different times since their last emergence and over broad land connections probably during the Wisconsinan glacial age to as recently as ~8000 years ago.

The avifauna is a depauperate sample of that of the Cuban mainland, comprising 28 species of resident land birds. Twenty-three (82%) of these are widely distributed elsewhere in the Antillean-Bahaman region. Only 3 (11%) of the 28 species are confined to the Cuban region: *Xiphidiopicus percussus*, *Vireo gundlachii*, *Teretistris fernandinae*. For the small scrub and mangrove covered islands in the Golfo de Guacanayabo, 8 of the 9 resident species (89%) are widespread. The occurrence of 25 species of land birds on Cayo Cantiles (the largest number on any island of the southern cayerias), in contrast to only 17 on the larger island of Cayo Largo, reflects the importance of habitat diversity over island area in determining species richness. Both islands have reasonably well-known avifaunas.

No species is endemic to the cayerias, but five have differentiated at the subspecific level within the islands: the woodpeckers *Melanerpes superciliaris* and *Xiphidiopicus percussus*, the flycatcher *Contopus caribaeus*, the vireo *Vireo gundlachii*, and the blackbird *Agelaius humeralis*. Populations of two other species, the thrush *Turdus plumbeus* and the grackle *Quiscalus niger*, appear to represent relict forms that have been largely replaced by other subspecies on mainland Cuba. Several puzzling patterns of distribution include the presence of *Agelaius humeralis* on Cayo Cantiles and in the Jardines de la Reina and its absence on the much larger Isle of Pines; the absence of the dove *Columbina passerina* from the Jardines de la Reina; and the absence of the flycatcher *Tyrannus caudifasciatus* from Los Canarreos.

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The Avifauna of the Cayerias of Southern Cuba, with the Ornithological Results of the Paul Bartsch Expedition of 1930

Donald W. Buden and Storrs L. Olson

Introduction

The foundation of island biogeography is knowing which organisms occur, or occurred, on a given island. Such information is not readily available for most of the islands in the several groups of cays (cayerias) along the southern coast of Cuba (Figure 1). In recent years the avifauna of these islands, as well as those along the northern coast of Cuba, has become much better known through the efforts of Orlando H. Garrido and other Cuban scientists. The literature on vertebrates from all Cuban cays thus far sampled has been summarized recently by Garrido et al. (1986). The impetus for the present study came largely from an important collection of birds in the National Museum of Natural History, Smithsonian Institution, taken in the southern Cuban cayerias by Paul Bartsch in 1930 that has not previously been reported on or analyzed. A smaller collection (also at the Smithsonian) from the same area was made by Thomas D. Burleigh and Allen J. Duvall in 1948 and likewise has never been fully described.

Review of these collections provides us with the opportunity to consolidate the information available in the Cuban literature, which is scattered and not at all readily accessible to most researchers. Several new subspecies were described from the southern cayerias, mainly by Garrido, a number of which had lain unnoticed in the Bartsch collection for over half a century. In most cases, the Bartsch specimens are the only representatives of these forms available outside of Cuba.

Donald W. Buden, New England Science Center, Harrington Way, Worcester, Massachusetts 01604. Storrs L. Olson, Department of Vertebrate Zoology, National Museum of Natural History, Smithsonian Institution, Washington, D.C. 20560.

*Review Chairman: Stanley H. Weitzman
Reviewers: William B. Robertson, Albert Schwartz.*

We emphasize at the outset that our knowledge of the distribution of birds in the Cuban cayerias is still very incomplete and no ornithological record exists for a large proportion of the smaller islands. The sampling can now be considered relatively adequate only for a very few islands, such as Cayo Cantiles. Most of Bartsch's landings, for example, were of extremely brief duration, and his chief interest lay in terrestrial mollusks.

ACKNOWLEDGMENTS.—We are very grateful to William B. Hilgartner for his assistance in the early stages of preparation of this report. For access to comparative material, we thank Kenneth C. Parkes, Carnegie Museum of Natural History (CM), Raymond A. Paynter, Jr., and Alison Pirie, Museum of Comparative Zoology (MCZ), and Eleanor Stickney, Yale Peabody Museum (YPM). We thank Francisco Ramos (Library of Congress), Charlotte Slocum (Clark University Map Library), Maurice Stuckey (Defense Mapping Agency), Frank Trout (Pusey Map Library, Harvard University), and David Backus, Kenneth Boss, and Ruth Turner (Mollusk Department, Museum of Comparative Zoology) for furnishing maps and charts that were invaluable in tracing the courses of the different expeditions. Buden's visit to the National Museum of Natural History was funded through the Office of Fellowships and Grants, Smithsonian Institution. For helpful comments on the manuscript we are indebted to Orlando H. Garrido, Kenneth C. Parkes, Allan R. Phillips, William B. Robertson, and Albert Schwartz.

The Southern Cayerias of Cuba and Their Exploration

SOURCE MATERIALS

During the summer of 1930, Paul Bartsch, malacologist at the National Museum of Natural History, Smithsonian

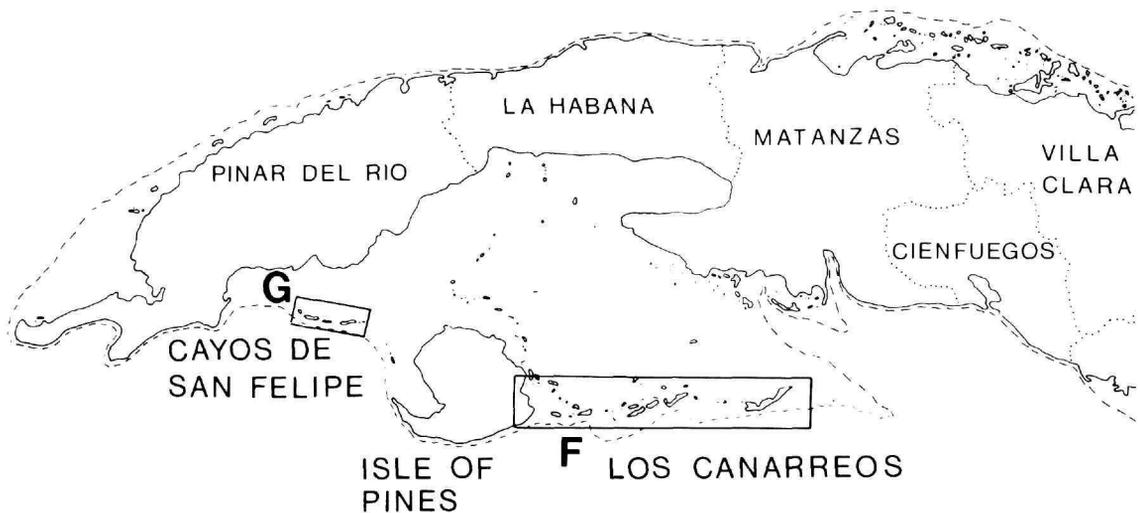


FIGURE 1.—Outline map of Cuba showing general location of the cayerias discussed in the text. (Letters refer to detailed maps in Figures 2 and 3. Dotted lines denote boundaries of provinces; broken line denotes 200 m bathymetric contour.)

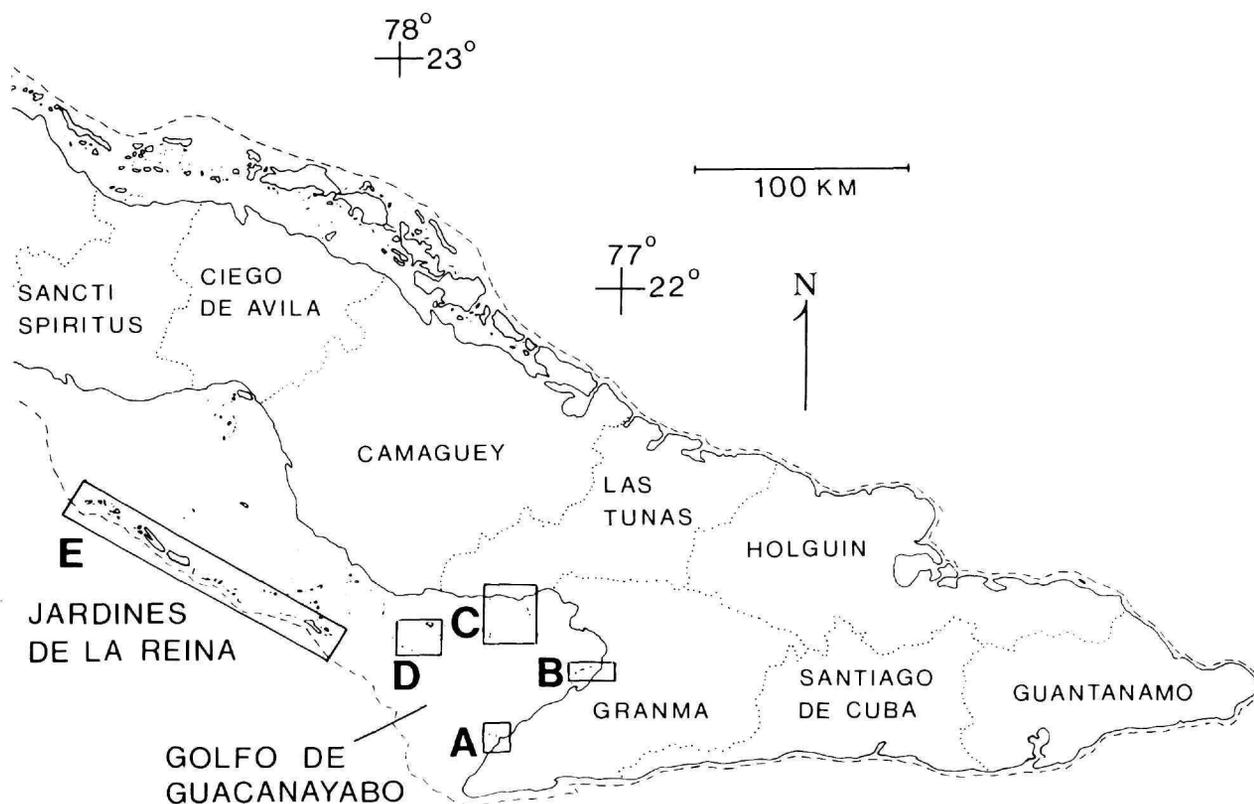
Institution, explored the southern Bahamas, the cays off the southern coast of Cuba, and the Cayman Islands, chiefly to investigate the mollusk fauna. He was accompanied by Harold S. Peters, entomologist, United States Department of Agriculture, Harold Chittick, one of Bartsch's former students at The George Washington University, and two Washington area boy scouts, Ray Greenfield, who had been with Bartsch in Cuba two years earlier, and Alva G. Nye, Jr. They visited many remote and little-known islands and returned with approximately 250,000 mollusks, along with specimens of 925 birds, 596 reptiles and amphibians, and examples of mammals, fishes, avian parasites, and miscellaneous invertebrates (Bartsch, 1931).

Although Bartsch (1931) gave a brief, general account of the expedition and Cochran (1931, 1934) reported on the amphibians and reptiles, the ornithological collections received curiously little attention, apart from some locality records being incorporated in a check-list of West Indian birds (Bond, 1956) and additional Bahaman records reported by Buden (1987a,b). To our knowledge, no scientific account of the mollusks was ever published either, and we hope that the following section on geography and Bartsch's itinerary will facilitate such a study. The ornithological account is based largely on Bartsch's unpublished journal (copies in the Division of Mollusks, National Museum of Natural History, and in the Smithsonian Institution Archives) along with data from the specimen labels and the USNM specimen catalog in the Division of Birds, Smithsonian Institution. Our photocopy of Bartsch's journal was furnished by the late Joseph Rosewater, Curator, Invertebrate Zoology (Mollusks), National Museum of Natural History, Smithsonian Institution. Another copy in the library of the Division of Mollusks differs slightly in punctuation,

spelling, and occasionally in wording, and seems to represent a less edited first version.

Additional specimens of birds from the cays of southern Cuba in the Smithsonian collections were taken in 1948 by Thomas D. Burleigh and Allen J. Duvall, who were accompanied by Abelardo Moreno. Their field catalog, in the archives of the U. S. Fish and Wildlife Service, Washington, D.C., indicates that they obtained 11 specimens on Cayo del Rosario (field numbers 288–298, 21 March) and 15 specimens on Cayo Cantiles (299–313, 22 March). Of the latter, 3 specimens (308–310; *Chlorostilbon ricordii*, *Dendroica discolor*, and *D. palmarum*) were noted as having been lost, and two of the four specimens of *Agelaius humeralis* (303, 304) somehow made their way into the collections of the University of Havana (see Garrido 1970:14) with no record having been made of their disposition. Several other specimens from this collection went as a gift to the University of Havana in 1952. The only publication resulting from this portion of the 1948 expedition was the description of a new subspecies of *Contopus caribaeus* (Burleigh and Duvall, 1948).

In the following section, we present the itinerary of the Bartsch expedition as derived from the Bartsch journal. Information concerning the explorations of the cayerias by other parties is in brackets. Geographic coordinates (where known) and island names are for the most part from the United States Board on Geographic Names (1963), the *Atlas Nacional de Cuba* (Consejo de Dirección del Atlas Nacional de Cuba, 1970) and the *Atlas de Cuba* (Consejo Nacional de Redacción del Atlas de Cuba, 1978). In other cases, place-names are taken directly from, or are based on descriptions in, Bartsch's journal, and supplemented with data from museum labels, the USNM catalog, and from other sources as noted.



In view of many variant spellings and misspellings of these place-names in different sources, the replication of names for different localities in Cuba, and the use of abbreviations on museum labels and in the catalog, we have made an effort to standardize the names and to clarify their usage. We also present a chronology of the expedition to help identify or set geographic limits to localities in cases where dates are available but locality data are vague or obscure. Places where birds were observed or collected are shown in Figures 1–3. Compared with older maps that were available to Bartsch, those published in recent years show more and smaller-sized islands, with more irregular coastlines. These differences probably are due in part to improved surveys and advances in cartography. But the configurations of low-lying sand and limestone barrier islands, such as these cays, are subject to fairly frequent and rapid changes as a result of wind and wave action, shoaling, etc. Some islands present during Bartsch's visit may no longer exist and others may have been formed since, all of this contributing to the difficulty of matching place-names with collecting sites.

ITINERARY OF THE BARTSCH EXPEDITION AND DESCRIPTIONS OF THE SOUTHERN CAYERIAS

The Bartsch expedition arrived at Guantánamo Bay on 11 August 1930, after nearly two months (17 June to 10 August) in the Bahamas. The *Island Home*, a 33-ton, flat-bottomed, 59-foot vessel, which burdened the crew with more difficulties than had been expected, was declared unseaworthy by naval authorities and was abandoned until repairs could be made. Bartsch chartered the *José Enrique*, a 35-ton, 60 foot sailing bark out of Santiago, for the remainder of the voyage. Numerous delays prevented the expedition from getting underway again until 28 August, and it was not until 1 September, when the *José Enrique* reached islands in the Golfo de Guacanayabo, that exploration of the cayerias began. The survey of these cays was interrupted temporarily for exploration of the Cayman Islands in the period 10–18 September. It ended when the expedition reached Nueva Gerona, Isle of Pines (renamed Isla de Juventud), on 24 September. Bartsch and his

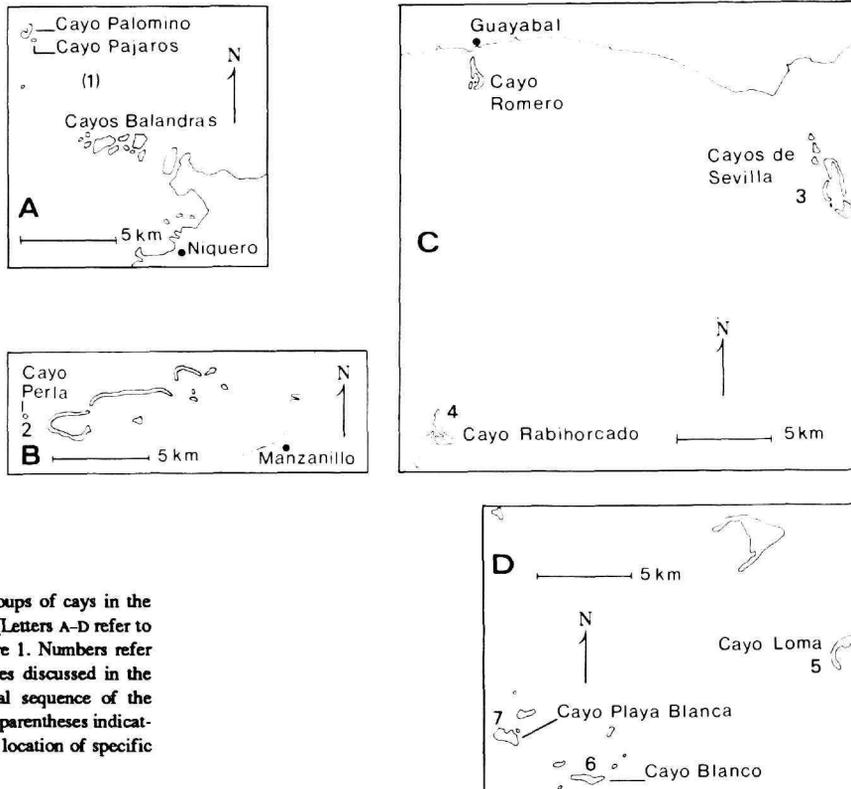


FIGURE 2.—Maps of groups of cays in the Golfo de Guacanayabo. (Letters A-D refer to the locator map in Figure 1. Numbers refer to the numbered localities discussed in the text in the chronological sequence of the Bartsch expedition, with parentheses indicating uncertainty as to the location of specific islands.)

associates reached Havana on 29 September and were in Washington, D.C., by 3 October 1930.

A chronological list of localities mentioned in the species accounts follows, generally in an east to west sequence. Quotations are from Bartsch's journal or the USNM catalog unless otherwise indicated. The resident land birds of each cayeria are discussed in the "Species Accounts" and are summarized in Table 6.

Cays in the Golfo de Guacanayabo

FIGURES 1, 2

Of these scattered cays, Bartsch noted that "mangroves are the prevalent element" and that "Naval engineers have subjected every sandy reach to fire and sword." Although treated separately here, these islands are considered part of the Archipiélago de los Jardines de la Reina on some maps.

1. Vicinity of Cayos Balandras. 1 September. The journal indicates that after passing the Cayos Limones north of Cabo Cruz on 31 August the *José Enrique* steamed north and came to anchor off the "Central Niquaria" [= Niquero] for the night. The following morning the expedition "set sail for the Cays at 8:30" and stopped at Cayo Palmetto, which was said to have a sand beach but proved to be only a "mangrove tangle."

Apparently, this is the locality Cayo Palomito mentioned in the catalog; however, neither of these names is on any of the maps we examined. Possibly the names are Bartsch's renditions of Cayo Palomino, which is identified on Hydrographic Office nautical charts similar to those used by Bartsch. Alternatively, Bartsch may have been referring to one of the Cayos Balandras, which are much closer to the Cuban mainland. That Bartsch mentions heading northward (not eastward or northeastward) to a place on the mainland south of Manzanillo after leaving the "Palmetto/Palomito" locality, and that *Zenaida aurita* is reported from this island but not from any of the others in the Golfo de Guacanayabo favors the latter interpretation, whereas Bartsch's selection of place names favors the former.

2. Cayo Perla (20°21'N, 77°15'W; Figure 2B), 2 September: "This is probably not more than an acre in extent, and very slightly elevated above the sea in its highest reaches." The greater part of the next two days (2 and 3 September) was spent in Manzanillo awaiting clearance of official papers and for the threat of a hurricane to pass.

3. Cayos de Sevilla (20°38'N, 77°27'W; Figure 2C), 4 September: These are the "Savilla Cays" of Bartsch's notes; the expedition spent approximately two hours ashore, but on which island of the cluster of Cayos de Sevilla is uncertain. Specimens labelled "between Savilla and Ramona Cays" were taken on the mainland of Cuba and are not included in the

discussions herein. There are no islands named Ramona in this area on any of the maps we examined, although a Cayo Romero (a peninsula on some maps and from one to three islands on others) is located south of Guayabal, near where Bartsch collected specimens on this date.

4. Cayo Rabihorcado (Figure 2c), 4–5 September: The expedition arrived in the evening, 4 September, but all bird records are from 5 September. “We went ashore and found quite an extensive prairie inside the Cay opposite our anchorage [off the northwestern end of the island].... After this we made another trip through a cut that separates the two main Cays of this group, and up on the east side. On the northeast side we found an extensive sand beach.... We found a rat skeleton, which probably explains what the animal was that we got a glimpse of this morning.” *Rabihorcado*, incidentally, is a Cuban vernacular for *Fregata magnificens*.

5. Cayo Loma (Figure 2d), 5 September: “Here there is a beautifully elevated sand beach at the southwest end.... We saw several Iguanas, but these animals have learned to seek their burrows in the ground the moment they get a glimpse of man, having probably received training from Naval officers, who frequent these Cays during their winter manoeuvres.”

6. Cayo Blanco (20°28'N, 77°57'W; Figure 2d), 6 September: Referred to as Blanca Cay in the catalog and as Cayo Blanca in the journal; the expedition spent “about an hour and a half on the narrow sand beaches.”

7. Cayo Playa Blanca (20°29'N, 78°00'W; Figure 2d), 6 September: This island is not mentioned in the journal but several specimens are so labelled, some of which were erroneously cataloged as being from Cayo Blanco.

Archipiélago de los Jardines (Jardinillos) de la Reina

FIGURES 1, 3E,E'

This extensive cayeria includes the islands (or perhaps more accurately, the spaces between the islands) known alternatively as the “Laberinto de las Doce Leguas,” that Bartsch wrote also as “12 Leagues” or “12 Leguas.”

[Garrido (1978b) provides a list of birds collected by Dr. Nerly Lorenzo (presumably all in February 1976) from Las Cruces, Boca Rica, and Caballones in the Jardines de la Reina group, but without specifically identifying which species was obtained on which island. All of these species were also recorded by Bartsch from this archipelago with the exception of the following, which are included in the species accounts simply as being known from the Jardines de la Reina: *Egretta ibis*, *Larus atricilla*, *Catoptrophorus semipalmatus*, *Zenaida macroura*, *Caprimulgus carolinensis*, *Tiaris olivacea*. Armas (1976) furnished brief descriptions of many of these islands as part of a report on the scorpions he collected there in late April 1971; he also collected birds at least on Caballones and Boca Rica cays (fide Garrido, 1978a).]

8. Cabeza del Este (20°31'N, 78°20'W), 6–7 September: On 6 September, Bartsch wrote: “Here we found quite a sandy

beach and rather extensive gun placements of concrete, but no land shells. We did, however, secure three Iguanas and twenty-three birds. Here and in the Zapata swamp immediately to the west.” Clearly Bartsch uses “zapata” to refer to a particular type of vegetative growth rather than to the well known Ciénega de Zapata in Matanzas Province. Bartsch’s journal entry for 7 September reads: “Our pilot told us there was a road two miles long on shore near our anchorage. We therefore went ashore immediately after breakfast only to find that, as usual, the pilot had engaged in vapping. The place where the houses, which we could see from our boat, was located, was merely a sandbar surrounded by a Zapata swamp. The same complex of birds that we saw yesterday was seen here, and a number were taken.”

9. Cayo Rosalía, 7 September: One of the cays between Cabeza del Este and Boca Juan Grín. The names used by Bartsch for this island and the following one are not in any of the gazetteers and maps that we examined nor in any of those examined for us by M. Stuckey at the Defense Mapping Agency, Washington, D.C.

10. Cayo Contra Punta, 7 September: One of the cays between Cabeza del Este and Boca Juan Grín; described as having “a limited sand beach.”

[Armas (1976) indicated that islands in the Boca Rica group resemble one another in having sandy soil and an abundance of *Conocarpus* and mangroves.]

11. Cay at 78°33'W, 7 September: “Our next stop was on the Cay indicated on Chart 2614 at a point about 78 33.” This would evidently be the island shown as Cayo Boca Seca in the *Atlas de Cuba* (Consejo Nacional de Redacción del Atlas de Cuba, 1978).

12. Boca Juan Grín (20°39'N, 78°34'W), 8 September: “We made a hasty trip to the island south of the cut known as Boca Juan Grín. Here is an extensive sandy hurricane rampart made possible by the outlying reef. This is covered with bunch grass and palmetto, and seems to have been often burned over. The western end, which is narrower, seems to have escaped fire.” Cochran (1934) reported on the gecko *Sphaerodactylus cinereus* [= *S. elegans*] taken by Bartsch’s party on a cay east of Boca Juan Gria [sic] on 8 September.

13. Cayo Cachiboca (20°42'N, 78°44'W), 8 September: “The coast between Boca Juan Grín and Point Indio is fringed by a bad reef, and the inrolling breakers decided me not to make an attempt at landing on the little cays in shore. Our first stop, therefore, was in the south bight of Cachiboca Cay.”

[Armas (1976) reported that Cachiboca has diverse habitats, including low woodlands, and that the soil is sandy except in the extensive inland marshy areas. His visit was confined to the southwestern part of the island.]

14. Cay west of Cachiboca [= Cayo Piedra Chica, see below], 8 September: This locality and the next present somewhat of a geographical enigma. They are not mentioned by name in the journal and apparently have different names and configurations on different maps (Figure 3E,E'). Bartsch states that after having left Cachiboca Cay they “sailed to the

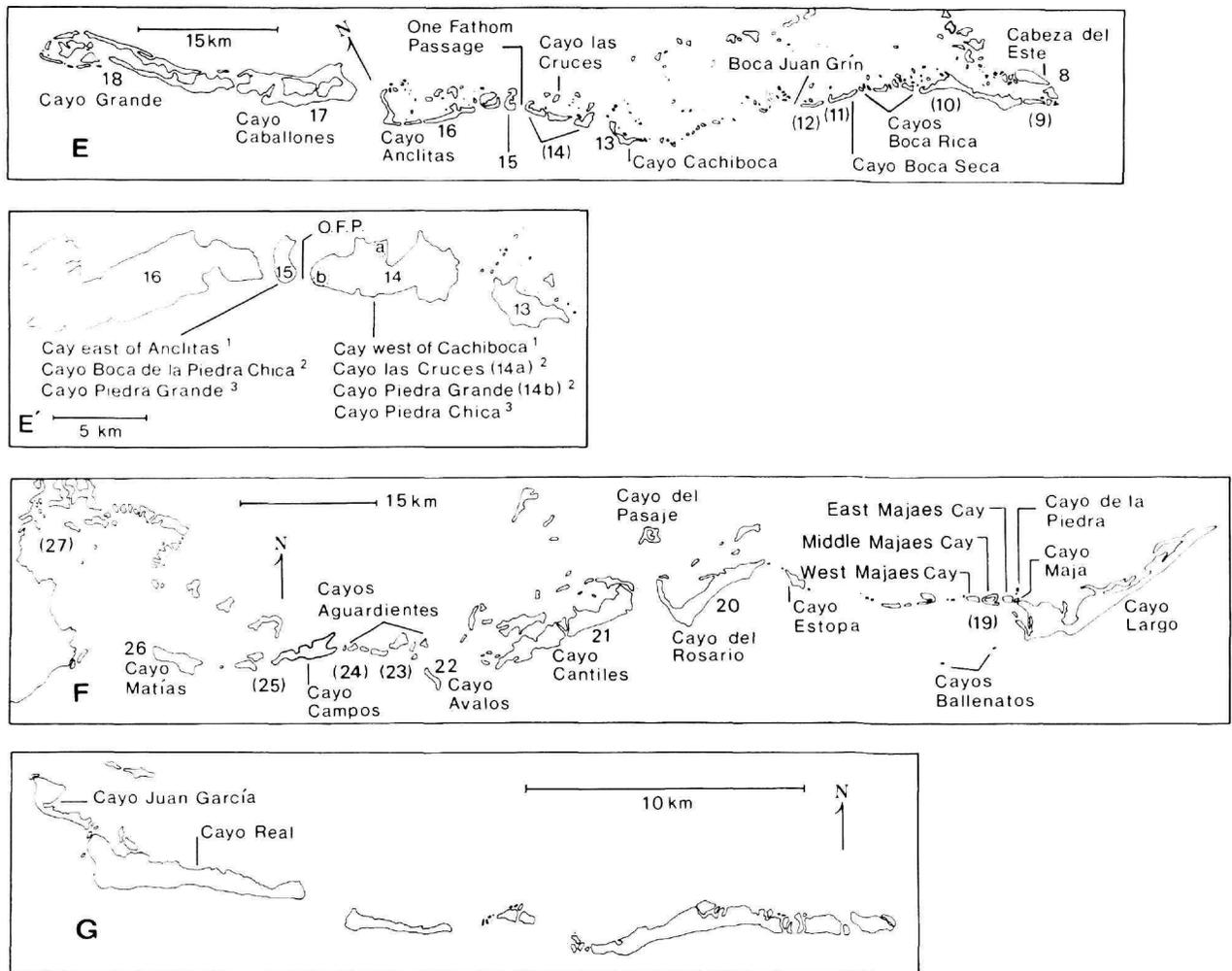


FIGURE 3.—Maps of the southern cayerias west of the Golfo de Guacanayabo. (Letters E-G refer to the locator map in Figure 1. Numbers refer to the numbered localities discussed in the text in the chronological sequence of the Bartsch expedition, with parentheses indicating uncertainty as to the location of specific islands. E, Archipiélago de las Jardines de la Reina (Laberinto de las Doce Leguas); E', Bartsch's localities from Cayo Cachiboca (13) to Cayo Anclitas (16) drawn from Hydrographic Office Chart 2614; O.F.P. = One Fathom Passage. Sources of alternative names: ¹Bartsch's field notes and specimen labels, ²*Atlas de Cuba* (Consejo de Redacción del Atlas de Cuba, 1978), ³*Atlas Nacional de Cuba* (Consejo de Dirección del Atlas Nacional de Cuba, 1970). Compare with Figure 3E drawn from *Atlas de Cuba* (1978). F, Archipiélago de los Canarreos. G, Cayos de San Felipe.)

large cay separated from Anclitas Cay by a small cay between the two.... Weighing anchor we came to rest for the night in the One Fathom Passage, making a hasty survey of the southeast end of the island south of Anclitas Cay.... Failing to find mollusks at this Cay, we crossed the channel and made a search of the island on the east side."

The two islands between Cayo Cachiboca and Cayo Anclitas in Figure 3E,E' fit the description of the two unnamed islands in the journal; the location of the One Fathom Passage is as shown in Hydrographic Office Chart 2614, which Bartsch used on this expedition.

[The cay west of Cachiboca, sensu Bartsch apparently is the island identified as Cayo Piedra Chica in the *Atlas Nacional de Cuba* (Consejo de Dirección del Atlas Nacional de Cuba, 1970) and is part of the same complex of cays that includes Las Cruces, where Nerly Lorenzo collected the holotype of *Contopus caribaeus nerlyi* Garrido in February 1976 and a specimen of *Xiphidiopicus percussus* (presumably at the same time). Armas (1976) described Piedra Chica as a large cay not far to the west of Cachiboca, heavily wooded (trees 8–10 m tall) and with *Opuntia*, *Conocarpus*, and palms.]

15. Cay east of Anclitas, 8 September: This locality, which

is mentioned in the catalog and on museum labels (where it is given as "passage east of Ancilote [sic] Cay"), doubtless is the same as the one described as south of Anclitas in the journal (see Figure 3E, remarks under locality 13, and under *Chordeiles* sp. in the "Species Accounts"). At this locality, Bartsch mentioned seeing "at least six Hutias [= *jutias*, the rodent *Capromys*] but were unable to bring one to bag.... After dark three of the men aboard went ashore and set fire to a lot of brush, enjoying what they called a Hutia hunt, but all they captured was the largest Iguana so far obtained. Their method of hunting consisted of setting a line of fires which would cast enough light to let them see the beasts." This account gives some idea of the fate of *jutias* in particular and of insular habitats in general in this cayeria.

16. Cayo Anclitas (20°48'N, 78°54'W), 9 September: Written "Ancilote Cay" in the catalog; the Bartsch collections were made on the southwest corner of the cay.

[Specimens were also obtained here in April 1975 by Regalado (1977a). Armas (1976) reported that at the western end of the island (to which his explorations were confined), just inland from an extensive white sand beach, the land rises abruptly to about 2 m above sea-level and stays at that level inland. He found *Metopium toxiferum* abundant in the region, and *Pectis ciliaris* near the beach. He also mentioned the presence of palms, tall grasses, dog tooth limestone, an extensive lagoon, and reported xerophytic vegetation along rocky parts of the coast.]

17. Cayo Caballones (20°52'N, 79°00'W), 9 September: Written "Caballo Cay" in the journal; Bartsch's collections were made on the southeastern corner of the cay.

[Specimens were also collected here by Armas in 1971 (Garrido, 1978a) and by Nerly Lorenzo (Garrido, 1978b), presumably in 1976. Regalado (1977a) also collected here, presumably in April 1975. He reports that the vegetation of Cayo Anclitas and Cayo Caballones is very scanty, formed essentially by *Coccothrinax* and *Metopium* and typical beach plants, without wooded areas except for *Coccoloba* (absent on Anclitas) and mangrove.]

18. Cayo Grande (20°59'N, 79°09'W), 9–10 September: Written "Grand Cay" in the journal and catalog. Collecting stops were made "about the middle of the south side, ... about half way between the last stop and the western point," and at "the western point."

Archipiélago de los Canarreos

FIGURES 1, 3F

This string of islands lies in the shallows known as the Banco de los Jardines and is sometimes referred to as the "Cayos de los Jardines y Jardinillos" (e.g., Bond, 1950), which can only cause confusion with the preceding archipelago. In its broadest sense, this archipelago includes the Isle of Pines and the Cayos de San Felipe (i.e., all the islands bordering the Golfo de Batabanó), but as used here consists only of the islands east

of the Isle of Pines. Schwartz (1959:117) stated that the majority of the seven islands that he visited in 1958 (Matías, Hicacos, Campos, Avalos, Cantiles, Rosario, Largo) "are sandy with scattered limestone rock formations, and support a dense growth of palms and xerophytes with a coastal fringe of mangroves," though Garrido and Schwartz (1969) note that the vegetation is not similar from one cay to another.

[Cayo Largo.—Known also as Cayo Largo del Sur, Cayo Largo is about 50 feet (15.2 m) in elevation (United States Hydrographic Office, 1927). According to Bond (1950:44), who collected here from 3 to 9 April 1948, "Cayo Largo is slightly over 14 miles in length with a maximum width of about 2 miles. Most of the terrain is very low, but along the southern shore extends a ridge, about 30 feet in height, that permits a splendid view of much of the island, which was seen to be uniform in character. Except along the rocky southern coast, there are extensive mangrove swamps, virtually impenetrable in many places. The interior was quite arid and was covered with dense scrub and palms (*Thrinax microcarpa* Sarg.). Along the northern shore and at the western end are extensive lagoons where numerous water birds were encountered."

Garrido visited Cayo Largo in May and June 1965, in April and May 1966, in April 1967, and in November 1969. Garrido and Schwartz (1969) describe the interior of the island as being in secondary vegetation dominated by *Metopium*, *Coccothrinax*, and with less abundant trees such as *Bursera*. They go on to say that Cayo Largo probably was uninhabited at the time of Bond's visit in 1948, and that mangroves and other dense vegetation probably made exploration difficult then. But when Garrido visited the island during the mid-1960s, an airstrip and paved roads were present, much of the original vegetation had been cut and replaced with pine, and more than 100 people were living there. It is now a tourist resort with hotels, cabins, and other facilities (Garrido in litt. 4 November 1987).]

[Cayo de la Piedra, Cayeria los Majaes, Cayos los Ballenatos, and Cayo Estopa: All are islands between Cayo Largo and Cayo del Rosario. Bartsch did not mention any of these by name but his locality "Sandy Cay" almost certainly is one of them (see below). Bond (1950) reported on birds he collected and observed on Cayo de la Piedra, on East, Middle, and West Majaes cays, and at Los Ballenatos, in the period 3–9 April 1948. Proctor (1950) and Wurtz (1950), who were on the same expedition, described some of these islands. Proctor (1950:33) provided a map and an aerial photograph of the region, stating that "the flora of Cayo Largo and adjacent islets is rather typical of most of the low, dry, limestone, northern West Indian islands (such as the Bahamas), consisting mainly of widespread sea-side or strand plants, and other hardy xerophytes. As exceptions to this general statement may be noted the apparent complete absence of the usually ubiquitous sea-grape, *Coccoloba uvifera* (L.) Jacq., of the giant ferns of the genus *Acrostichum*, which one expects in brackish swamps, especially along the fringes of black mangrove thickets, and

the presence of the endemic Cuban composite, *Pectis leonis* Rydb., a considerable range extension.”]

[Garrido observed and collected on Cayo de la Piedra, Cayo Majá, on Los Ballenatos, and on Cayo Estopa in May and June 1965 (Garrido and Schwartz, 1969). He also visited this area in May 1966, and in April 1967 (Garrido, 1971a). Varona (1970) listed the birds observed by Garrido on Cayo Majá without dates or additional data and mentions another expedition to at least some of these islands in late November 1969, though we are unaware of any ornithological report emanating from this visit. All of these islands are shown in Figure 3F.]

19. Cayo Arenoso, 19 September: According to Bartsch's notes, Sandy Cay (= Cayo Arenoso) “has an extensive sand beach on the south side and an oolitic rock outcrop along the shore above the sand beach, and is covered in part on the coasts with palmetto, which is thin leaved and has clusters of very light fruit. The shore portion contains Bay Cedar and other shrubs, while an extensive ramifying lagoon inside has the usual mangrove that here has been converted largely into charcoal.” The journal also mentions “tall palmettos on the central portion of the north shore.” Maps from the early 1900s show an island called Sandy Cay west of Cayo Largo in the area occupied by Cayos Perases, Cayo Rico, and Cayería los Majaes in the *Atlas de Cuba* (Consejo Nacional de Redacción del Atlas de Cuba, 1978). We cannot say with certainty, however, which of these is Sandy Cay sensu Bartsch. There is a possibility also that the expedition made landfall at the western end of Cayo Largo, a large island that the expedition otherwise inexplicably skipped, although Bartsch's description seemingly is that of an island much smaller than Largo. At this point in the journey there was some confusion as to the position of the expedition, but the journal entry for 21 September states rather unequivocally that “the discovery of the flashing beacon last night [presumably the navigational light at Los Ballenatos] gave us our location and proved that we landed west of Cayo Largo. Our first landing, therefore, on the 19th was on the south coast of Sandy Cay, and the next station was on the east end of Cayo Rosario.” Bartsch reported sighting a “Red-bellied Woodpecker” (*Melanerpes supercilialis*) on Sandy Cay, a species known from Cayo Largo but that has not otherwise been reported from any of the islands between Cayo Largo and Cayo Cantiles. Bond and Garrido independently visited some of the islands between Largo and Rosario (see descriptions of Cayo de la Piedra and nearby cays immediately above) but neither mentions Cayo Arenoso or Sandy Cay in his report.

20. Cayo del Rosario (21°38'N, 81°53'W), 19–20 September: On 19 September, Bartsch described the eastern end of island as having “conditions not unsimilar to those described in the last [Cayo Arenoso], excepting that the interior lagoon was lacking and a little more sand was present.” On 20 September, near South Point, he said: “Here again palmettos and shrubs, mostly low-bush, hold sway as far as vegetation is concerned.” Cayo del Rosario has an extensive area of beach and a rather large area of dry forest (*monte firme*) and mangrove

(Garrido and Schwartz, 1969). Burleigh, Duvall, and Moreno collected here on 21 March 1948 (see “Source Materials”).

21. Cayo Cantiles (21°36'N, 82°02'W), 20–21 September: On 20 September, Bartsch described the eastern end of island: “This part of the cay consists of honeycombed limestone supporting a dense growth of palmetto and a few scattered coconuts, as well as tall shrubbery Our next stop was a couple of squares west of this one and separated from it by a deep bight, which apparently extends as a low swampy area well across the island.” On 21 September, Bartsch described the northern end of island: “Here we found no sand, but dense interior wooded areas rising directly from the honeycombed flat coral rock. In the bight a little to the south was a small grassy area...”

[In addition to Bartsch, collections were made here by Burleigh, Duvall, and Moreno on 22 March 1948 (see “Source Materials”). Albert Schwartz and George R. Zug visited the island on 29 July 1958 and Garrido explored and collected there during the summer of 1962, in April and May 1966, and 9 to 15 April 1967. According to Schwartz (1959:118), Cayo Cantiles “is extremely rocky with little sand, and is covered by an almost impenetrable jungle of broadleaved trees, lianas, and shrubs.” The following is extracted from Garrido and Schwartz (1969): Cantiles is the second largest of the islands in the Archipiélago de Los Canarreos, being about 16 km long and no more than 4.5 km wide at the widest point; it is smaller than Cayo Largo but it has a more luxuriant vegetation as well as greater habitat diversity. The habitat here resembles that of the southern part of the Isle of Pines and the Guanahacabibes Peninsula of Cuba, with hardwood forest growing out of weathered “dogtooth” (*diente de perro*) limestone, and with many natural sinks containing fresh water during the rainy season, as well as large, mainly freshwater lagoons. The roads and trails made by charcoal burners facilitated exploration of the densely vegetated areas inland.

22. Cayo Avalos (21°33'N, 82°10'W), 21 September. [Schwartz (1970) mentioned that ground lizards (*Ameiva*) were secured on Cayo Avalos in xerophytic vegetation that covers most of the cays in this area.]

23. Rum Cay, 21 September: “We next headed for a cay facing Avalos but a couple of miles west of it. This cay has a conspicuous white sandy beach facing southeast.” Bartsch reports *Geothlypis trichas* among the birds seen on the cay and the catalog shows that a specimen was collected on Rum Cay on 21 September, there being no other records of this species on 21 September in the journal or catalog. In all probability, this island is one of the Cayos Aguadientes (Figure 3F), though none is identified specifically as Rum Cay on any of the maps we examined. There is a Cayo Ron just north of Cayo Cantiles, but not corresponding to the position of the island mentioned by Bartsch.

24. Cay west of Avalos, 22 September. Bartsch reported that after leaving Rum Cay on 21 September, “We headed westward along the coast but got stuck on a sandbar, which held us until 7 O'clock. After being freed we came to anchor

for the night. September 22. At a quarter after six we rowed ashore to a sand bank on the cay west of the one we last explored last night, but found no mollusks here. Birds seen here were: Prairie Warbler, Cormorant, Brown Pelican, and Cabbot's [sic] [= Sandwich] Tern."

25. At sea between Cayo Avalos and Cayo Matías, 22 September: The limits of this locality may be narrowed further, as it is between the unnamed cay in locality 23 and Cayo Matías. Only two species of birds are reported, *Sterna anaethetus* and *S. albifrons*.

[Cayo Campos. This cay was visited by Estrada and Rodriguez (1985) from 2 to 4 May 1982, who listed the vertebrates they encountered in their explorations of the central part of the island and along the southern coast.]

26. Cayo Matías (21°34'N, 82°26'W), 22 September: Written "Mathias Cay" in the journal and "Cayo Mathios" in the catalog. "About noon we went ashore...at a sandy beach covered with palmettos, Bay Cedar and other shrubs."

27. Cays between Cayo Matías and Nueva Gerona, 23–24 September: "We left our anchorage at six this morning [23 September] and headed for a path through the cays for the inland sea leading to Nueva Gerona. Unfortunately, the Captain misjudged the channel to which we had been directed during the palaver last night, and this morning ran us hard aground on the south side of the bank of cays where we stayed from 9 in the morning until the same hour in the evening, in spite of all our coaxing and efforts to persuade the schooner to get off. Realizing that we were hopelessly anchored until the night tide, we spent the afternoon exploring the mangrove cays, on which we found nothing but a tangle of roots all planted in shallow water—not a bit of solid land." On 24 September: "We left our anchorage at seven O'clock this morning and headed westward for the mainland, but found no passage through the cays to the northward at this point, so we reversed and ran east to a fishing boat, from which we again received instructions as to the passage through the cays, which we succeeded in negotiating; but not, however, until we had run aground again at the entrance to the passage. This passage reminded one very much of the Shark River region of Florida, deep and clear, two to three fathoms, with grassy bottoms, strong current and mangrove-fringed shores.... The rest of the journey to Nueva Gerona was uneventful, barring a little fire in the engine room and regasketing of the carburator."

It was evidently Bartsch's practice to write in advance the general locality information crosswise at the tied end of his labels (that were homemade out of brown paper and are none too legible) and then add the specific data later. All of the specimens collected at this site were taken on 23 September and are labelled across the end of the labels as "Isle of Pines," obviously without the expectation of spending the day aground. Probably because of their delayed arrival in Nueva Gerona, the specific locality information was never added and all these specimens were cataloged simply as having come from the Isle of Pines.

[Cayos de San Felipe]

FIGURE 3G

This group of cays lies northwest of the Isle of Pines about midway between that island and the southern coast of Pinar del Río Province, Cuba. Bartsch did not visit these cays and our knowledge of their avifauna proceeds entirely from the studies of Varona and Garrido (1970) and Garrido (1973b). Only two of the islands have as yet been explored biologically, during two expeditions of the Instituto de Biología de la Academia de Ciencias de Cuba that took place in late fall and winter, thus accounting for the lack of records of such migratory species as *Tyrannus dominicensis* and *Vireo altiloquus*, as well as uncertainties as to the resident status of others, such as *Columba inornata*. Garrido (1973b) reported that the islands thus far explored (Cayo Real and Cayo Juan García) have a depauperate land bird fauna, for which he offered several possible explanations, including small island size and limited habitat diversity (especially for Juan García), a large population of feral cats, and the destruction of woodlands for charcoal.

Cayo Real (21°58'N, 83°35'W): Visited by Garrido and others in mid-October 1970. According to Garrido (1973b), the central part of the island has dense woodland, the interlaced branches of trees greatly limiting the amount of light penetrating the canopy. A zone of palmettos is in the north. Mangroves are found in the south, and mangroves and strand vegetation occur along the coast. Open or sparsely vegetated areas occur inland. Rock formations resembling dog-tooth limestone are scattered throughout.

Cayo Juan García (21°59'N, 83°38'W): Visited by Garrido and others in late February to early March and in mid-October 1970. According to Varona and Garrido (1970), this island is small, with a limited area of woodland, though black mangrove (*Avicennia nitida*) and red mangrove (*Rhizophora mangle*) are common along the coast. Strand plants are found in sandy areas near the beach, whereas palms [presumably *Coccothrinax*] and diverse shrubs, including cocoa-plum (*Chrysobalanus icaco*) are further inland. Dense growths of halophytes such as *Batis maritima* are in low areas near the mangroves. Armas (1976) indicated that the soil is sandy, with only a few small rocks. Garrido (in litt., 4 November 1987) states that *Tyto alba* occurs here, but it is not listed in Varona and Garrido (1970) and we have omitted it from our accounts.

Species Accounts

In order to present our various data, we have adopted several conventions that require explanation. The "records" section is based in large measure on the Bartsch expedition. Accounts of species that were not encountered on that expedition are in brackets. Locality records with no further attribution are sight records taken from Bartsch's journal. We have omitted certain sight records reported in the journal in cases where there is some doubt as to identification of species or where names are

ambiguous. Many of the common names given to tyrannids in the journal fall into the latter category and our report on species of Tyrannidae, with the exception of *Tyrannus dominicensis*, is limited to catalogued material.

Specimens obtained by Bartsch (and by Burleigh and Duvall) are indicated by the number of individuals of each sex (e.g., 2M, 1F = 2 males and 1 female), followed by the date only in those instances when Bartsch was at a particular cay on more than one day; otherwise dates can be derived from the preceding itinerary. The four different archipelagos or groups of islands are separated by diagonal slashes and the progression is from east to west as follows: Cays in the Golfo de Guacanayabo/Archipiélago de los Jardines de la Reina/Archipiélago de los Canarreos/Cayos de San Felipe. A blank space between two slashes (/ /) indicates no records for a particular island group. The slashes are omitted when all records pertain to one island only.

The sequence and nomenclature we have used generally follows Bond (1956), for lack of a better, less dated source (A.O.U. 1983, for example, does not include subspecies and has introduced systematic conclusions and names that are unsatisfactory to us). Departures are as follows: the sequence of pelecaniform families follows Lanham (1947); the systematics of the Ardeidae is that of Payne and Risley (1976); use of the family names Plataleidae, Vulturidae, and Halcyonidae is in conformation with the Law of Priority; placement of the Phoenicopteridae follows Olson and Feduccia, 1980; reasonable generic mergers that have generally been accepted since Bond (1956) are *Ajaia* into *Platalea*, *Squatarola* into *Pluvialis*, *Crocethia* into *Calidris*, *Thalasseus* into *Sterna*, *Columbigallina* into *Columbina*, *Centurus* into *Melanerpes*, and *Mimocichla* into *Turdus*. Other departures are explained in the text.

Family FREGATIDAE

Fregata magnificens Mathews

Magnificent Frigatebird

RECORDS.—Vicinity of Cayos Balandras (= Cayo Palmetto in Bartsch's journal; "a small bunch roosting"), Cayo Perla, Cayos de Sevilla, Cayo Rabihorcado, Cayo Loma, Cayo Blanco/Cabeza del Este, Cayo Rosalía, Cayo Contra Punta, Boca Juan Grín, Cayo Cachiboca, Cayo Anclitas, Cayo Grande/Cayo Largo (Bond, 1950), Cayo Majá (Varona, 1970), Cayo Arenoso, Cayo Cantiles (Garrido and Schwartz, 1969), Cayo Campos (Estrada and Rodríguez, 1985), Cayo Matías, cays between Cayo Matías and Nueva Gerona/ /.

Family PELECANIDAE

Pelecanus occidentalis Linnaeus

Brown Pelican

RECORDS.—Cayo Perla, Cayos de Sevilla, Cayo Rabihorcado, Cayo Loma, Cayo Blanco/Cabeza del Este, Cayo Rosalía,

Cayo Contra Punta, Boca Juan Grín, Cayo Cachiboca (1F), Cayo Anclitas, Cayo Grande/Cayo Largo (nesting—Garrido in litt., 4 November 1987), Cayo de la Piedra and vicinity of Cayo Largo (Bond, 1950), Cayo Majá (Varona, 1970), Cayo Arenoso, Cayo Cantiles (Bartsch, journal; Garrido and Schwartz, 1969, specimen), Rum Cay, cay two to several miles west of Avalos, Cayo Campos (Estrada and Rodríguez, 1985), Cayo Matías/Cayo Juan García (Varona and Garrido, 1970).

REMARKS.—Bartsch reported in his journal that at Cayo Cachiboca, "The striking thing here was a small nesting colony of Brown Pelicans; three nests in a small buttonwood tree. Two of the nests had two eggs, fresh, and the third had one egg, but an egg was found on the ground which might have fallen out of the nest." Bartsch collected a single specimen at Cayo Cachiboca, this being a female (USNM 323326) with a white head, chestnut neck, wing length of 490 mm, and culmen length of 285 mm.

Wetmore (1945) identified this specimen as belonging to the subspecies *P. o. carolinensis* Gmelin, to which he referred the breeding populations of Cuba. Bond (1950:45), on the other hand, assigned a female with an "undeveloped egg" that he collected on 1 April from a colony on Cayo de la Piedra off the northwestern end of Cayo Largo, to the subspecies *P. o. occidentalis*. He considered, on the basis of material that was not available to Wetmore, that *P. o. occidentalis* was the breeding form in Cuba, although banding returns established that *P. o. carolinensis* "occurs in Cuban waters during every month of the year." It is not certain, however, whether the specimen taken on Cayo Cachiboca was a member of the breeding colony that Bartsch found there or a nonbreeding visitor. Garrido and Schwartz (1969) assigned a female from Cayo Cantiles to the nominate race.

Family SULIDAE

[*Sula leucogaster* (Boddaert)]

[Brown Booby]

[RECORDS.—A few seen on Los Ballenatos rocks, west of Cayo Largo (Bond, 1950).]

Family ANHINGIDAE

Anhinga anhinga (Linnaeus)

Anhinga

RECORDS.—Recorded by Bartsch in his journal for Cabeza del Este, without further comment. This is the only record of the species for the southern cayerias (although resident on the Isle of Pines) and requires confirmation.

Family PHALACROCORACIDAE

Phalacrocorax auritus (Lesson)

Double-crested Cormorant

RECORDS.—Cayos de Sevilla/Cabeza del Este (1F, 6

September), Cayo Rosalía, Cayo Contra Punta, Boca Juan Grín, Cayo Cachiboca, Cayo Anclitas/Cayo Largo and outlying cays (Bond, 1950), Cayo Majá (Varona, 1970), Cayo Cantiles (Bartsch, journal; Garrido and Schwartz, 1969, specimen[s?]), Rum Cay, cay west of Avalos, Cayo Campos (Estrada and Rodríguez, 1985), cays between Cayo Matías and Nueva Gerona (1F)/Cayo Juan García (Varona and Garrido, 1970).

REMARKS.—Two species of cormorants have been confirmed to occur in Cuba, *P. auritus* and *P. olivaceus* (Humboldt), both of which are regarded as breeding there. Garrido and García (1975) consider *P. auritus* to be almost completely coastal in distribution in Cuba, with *P. olivaceus* being essentially confined to fresh-water. Because these two species are so similar, sight identifications cannot be relied upon except under unusual conditions. Bartsch, in his journal, referred some of the above records to *P. olivaceus* (Cayo Rosalía, Cayo Contra Punta, and Cayo Cantiles), but the remainder he did not identify to species. The only specimens taken, however, are referable to *P. auritus floridanus*. Bond (1950:45) reported cormorants as “frequently seen off the coast of Cayo Largo and about the outlying cays” and listed them under *P. a. floridanus*. Garrido and Schwartz (1969), Varona (1970), and Varona and Garrido (1970) list records under *P. auritus*. Without specimens, the presence of *P. olivaceus* in the southern cayerias cannot be confirmed.

On 23 September, Bartsch found cormorants breeding in considerable numbers on the cays between Cayo Matías and Nueva Gerona, with nests ranging from a couple of meters above water to the tips of the mangroves and young of various sizes up to fully fledged. The single specimen from this colony, as mentioned, is *P. auritus*.

Family ARDEIDAE

Ardea herodias Linnaeus

Great Blue Heron

RECORDS.—[Gray phase]: / /Cabeza del Este, Cayo Rosalía/Cayo Largo (Garrido, in litt., 4 November 1987), cays off western Cayo Largo (Bond, 1950), Cayo Cantiles (Garrido and Schwartz, 1969; color phase not mentioned), cays between Cayo Matías and Nueva Gerona/Cayo Juan García (Varona and Garrido, 1970; color phase not mentioned).

[White phase]: / /Cabeza del Este, Cayo Rosalía, Cayo Grande/Cayo Largo, specimen (Garrido, in litt., 4 November 1987), easternmost of Cayos Majaes (Bond, 1950, specimen)/Cayo Real (Garrido, 1973b).

REMARKS.—The Great White Heron (*Ardea occidentalis* Audubon) is now generally regarded as a color morph of *Ardea herodias*, an interpretation that may be an oversimplification, and that usually results in loss of information.

Ardea alba Linnaeus

Great Egret (Common Egret)

RECORDS.—/ /Cabeza del Este/Cayo Largo (Bond, 1950), Cayo Majá (Varona, 1970), Cayo Cantiles (Garrido and Schwartz, 1969)/ /.

[*Egretta rufescens* Gmelin]

[Reddish Egret]

[RECORDS.—/ / /Cayo Largo (Garrido and Schwartz, 1969), East Majaes Cay (Bond, 1950, specimen), Cayo Campos (Estrada and Rodríguez, 1985)/Cayo Real (Garrido, 1973b), between Cayo Juan García and Cayo Real (Varona and Garrido, 1970).

REMARKS.—Bond (1950) found this species common in the vicinity of Cayo Largo, and Garrido and Schwartz (1969) reported several seen on Largo during Garrido's visit(s)—all of these were dark phase. The one specimen reported from Cayo Real was white phase (Garrido, 1973b). A male taken 5 April on East Majaes Cay had slightly enlarged testes (Bond, 1950).]

Egretta tricolor (Müller)

Louisiana Heron

RECORDS.—/ /Cabeza del Este, Cayo Rosalía, Cayo Contra Punta, Cay east of Anclitas/Cayo Largo (Bond, 1950; Garrido and Schwartz, 1969), Cayo Arenoso, Cayo del Rosario (1F, Burleigh and Duvall), Cayo Cantiles (Bartsch journal; Garrido and Schwartz, 1969), Cayo Campos (Estrada and Rodríguez, 1985)/Cayo Juan García (Garrido, 1973b).

[*Egretta ibis* (Linnaeus)]

[Cattle Egret]

[RECORDS.—/ /Jardines de La Reina (Garrido, 1978b)/Cayo Largo (Garrido and Schwartz, 1969), Cayo Majá (Varona, 1970), Cayo Cantiles (Garrido and Schwartz, 1969), Cayo Campos (Estrada and Rodríguez, 1985)/Cayo Real (Garrido, 1973b), Cayo Juan García (Garrido, 1973b).

REMARKS.—The Cattle Egret was unknown in the West Indies prior to 1948 (Bond, 1971) but dispersed throughout the Caribbean region during the next decade. It was reported in Cuba for the first time in 1954 (Bond, 1959). Although now well established in Cuba and on the Isle of Pines (Garrido and García, 1975), records for the outlying cays are scanty. Garrido and Schwartz (1969) reported four seen on Cantiles and several seen on Largo, and Garrido (1973b) stated that some were seen on Real and Juan García; the other reports give no indication of numbers of individuals observed.]

***Egretta caerulea* (Linnaeus)**

Little Blue Heron

RECORDS.—/ /Cabeza del Este/Cayo Largo and vicinity ("probably the most numerous of the herons," Bond, 1950:46), Cayo Majá (Varona, 1970)/Cayo Real (Garrido, 1973b), Cayo Juan García (Garrido, 1973b).

[*Egretta thula* (Molina)]

[Snowy Egret]

[RECORDS.—/ /Cayo Largo and adjacent cays (Bond, 1950), Cayo Majá (Varona, 1970), Cayo Cantiles (Garrido and Schwartz, 1969)/Cayo Juan García (Garrido, 1973b).]

***Ardeola striata* (Linnaeus)**

Green Heron

RECORDS.—/ /Cabeza del Este (1F juvenile, 7 September)/Cayo Largo (Bond, 1950; Garrido and Schwartz, 1969), Cayo Majá (Varona, 1970), Cayo Arenoso, Cayo Cantiles (Bartsch, journal; Garrido and Schwartz, 1969), Cayo Campos (Estrada and Rodríguez, 1985), cays between Cayo Matías and Nueva Gerona/Cayo Juan García (Varona and Garrido, 1970).

***Nyctanassa violacea* (Linnaeus)**

Yellow-crowned Night-Heron

RECORDS.—/ /Cabeza del Este, cay east of Anclitas, Cayo Anclitas (1M adult, *N. v. violacea*) / /.

REMARKS.—Bond (1950) found the absence of night herons of either species at Cayo Largo strange.

[*Nycticorax nycticorax* (Linnaeus)]

[Black-crowned Night-Heron]

[RECORDS.—/ /Cayo Majá (Varona, 1970), Cayo Cantiles (Garrido and Schwartz, 1969, specimen[s])/Cayo Real (Garrido, 1973b), Cayo Juan García (Garrido, 1973b).]

Family PLATALEIDAE***Eudocimus albus* (Linnaeus)**

White Ibis

RECORDS.—/ /Cayo Campos (Estrada and Rodríguez, 1985), cays between Cayo Matías and Nueva Gerona (one seen 24 September)/Cayo Real (Garrido, 1973b), Cayo Juan García (Varona and Garrido, 1970).

[*Platalea ajaja* Linnaeus]

[Roseate Spoonbill]

[RECORDS.—/ /Cayo Cantiles (Garrido and Schwartz, 1969), Cayo Campos (Estrada and Rodríguez, 1985)/ /]

Family ANATIDAE**[*Dendrocygna arborea* (Linnaeus)]**

[West Indian Whistling-Duck]

[RECORDS.—Cayo Cantiles (Garrido and Schwartz, 1969).]

[*Anas discors* Linnaeus]

[Blue-winged Teal]

[RECORDS.—Cayo Real (Garrido, 1973b).]

Family VULTURIDAE***Cathartes aura* (Linnaeus)**

Turkey Vulture

RECORDS.—/ /Cayo Contra Punta/Cayo Largo, including nearby islands (Bond, 1950; Garrido and Schwartz, 1969), Cayo Majá (Varona, 1970), Cayo Arenoso, Cayo del Rosario, Cayo Cantiles (Bartsch, journal; Garrido and Schwartz, 1969), Cayo Campos (Estrada and Rodríguez, 1985)/Cayo Real (Garrido, 1973b), Cayo Juan García (Varona and Garrido, 1970).

Family ACCIPITRIDAE**[*Accipiter gundlachi* Lawrence]**

[Gundlach's Hawk]

[RECORDS.—Cayo Cantiles (Garrido and Schwartz, 1969).

REMARKS.—One individual was seen by Garrido, although he thought that it seemed lighter in color than typical for this species, prompting the suggestion that it may have been a vagrant individual of *A. cooperi* from North America. Given the dubiousness of the record and the fact that *A. gundlachi* does not even occur on the Isle of Pines, we do not include the species in further analyses and discussion.]

***Buteogallus anthracinus* (Deppe)**

Common Black-hawk

RECORDS.—/ /Cabeza del Este (1M, 6 September), Cayo Cachiboca (1M), Cayo Grande (1M, 1F, 9 September)/Cayo Largo and Cayeria los Majaes (Bond, 1950, specimen; Garrido and Schwartz, 1969; Varona, 1970), Cayo del Rosario, Cayo Cantiles (Garrido and Schwartz, 1969, specimen[s]), Cayo Campos (Estrada and Rodríguez, 1985)/Cayo Real (Garrido, 1973b), Cayo Juan García (Garrido, 1973b; Varona and Garrido, 1970).

REMARKS.—All specimens are referable to the Cuban subspecies *B. a. gundlachii* (Cabanis). This is the most common raptor among at least the larger of the southern cays. Bartsch saw this species on several islands in the Jardines de la Reina and in the Canarreos chain, but the absence in the field journal of any mention of these hawks from cays in the Golfo

de Guacanayabo suggests that it is absent or at least scarce among these smaller and more widely scattered islands.

One of several nests found on Largo and in Los Majaes contained a newly hatched young on 4 April (Bond, 1950). Garrido and Schwartz (1969) reported a nest on Cayo Cantiles occupied by an adult, and another on Cayo Largo that contained two eggs—dates not given.

Family PANDIONIDAE

Pandion haliaetus (Linnaeus)

Osprey

RECORDS.—Vicinity of Cayos Balandras (= Cayo Palmetto in Bartsch's journal), Cayo Blanco/Cayo Contra Punta, Boca Juan Grin, Cayo Caballones, Cayo Grande/Cayo Largo and West Majaes Cay (specimens, Bond, 1950), Cayo de la Piedra (Garrido and Schwartz, 1969, specimen), Cayo Arenoso, Cayo Cantiles (1M, Burleigh and Duvall; Garrido and Schwartz, 1969), Cayo Campos (Estrada and Rodríguez, 1985)/ /.

REMARKS.—The specimens all pertain to the race breeding in Cuba (*P. h. ridgwayi* Maynard), but as nonbreeding individuals from North America belonging to *P. h. carolinensis* (Gmelin) have been reported in Cuba from 10 August to 14 May (Garrido and García, 1975; Bond, 1956) sight records could pertain to either form. Garrido and Schwartz (1969) considered all those seen on Cayo Cantiles to be referable to *P. h. ridgwayi*, and Estrada and Rodríguez (1985) listed their record under this subspecies. Bond (1950) rather ambiguously lists *P. h. carolinensis* from the vicinity of Cayo Largo in addition to the resident form. A pair of *P. h. ridgwayi* that he collected at a nest on West Majaes Cay had enlarged gonads on 8 April—the female had an undeveloped egg about 2 inches long. Burleigh and Duvall's bird from Cayo Cantiles was noted as being very fat and having the testes very small on 21 March.

Family FALCONIDAE

[*Falco peregrinus* Tunstall]

[Peregrine Falcon]

[RECORDS.—Los Ballenatos, one seen (Bond, 1950:48).]

Falco sparverius Linnaeus

American Kestrel (Sparrow Hawk)

RECORDS.—/ / /Cays between Cayo Matías and Nueva Gerona (one seen 23 September)/Cayo Juan García (single pair seen by Garrido; Varona and Garrido, 1970).

Family RALLIDAE

Rallus longirostris Boddaert

Clapper Rail

RECORDS.—Cayo Rabihorcado, Cayo Blanco/Cabeza del

Este, cay east of Anclitas, Cayo Anclitas/Cayo Largo (Bond, 1950; Garrido and Schwartz, 1969), Cayo Majá (Garrido and Schwartz, 1969; Varona, 1970), Cayo Cantiles (Bartsch, journal; Garrido and Schwartz, 1969), Cayo Avalos, Rum Cay, Cayo Campos (Estrada and Rodríguez, 1985), Cayo Matías/Cayo Real (Garrido, 1973b), Cayo Juan García (Varona and Garrido, 1970).

Family CHARADRIIDAE

Charadrius semipalmatus Bonaparte

Semipalmated Plover

RECORDS.—Cayo Matías (1M).

Charadrius wilsonia Ord

Wilson's Plover

RECORDS.—/ /Cabeza del Este, Cayo Rosalía, Cayo Contra Punta/Cayo Largo (Bond, 1950; Garrido and Schwartz, 1969), Cayo Avalos, Cayo Campos (Estrada and Rodríguez, 1985), Cayo Matías (2F, *C. w. wilsonia*)/Cayo Real (Garrido, 1973b), Cayo Juan García (Garrido, 1973b).

Pluvialis squatarola (Linnaeus)

Black-bellied Plover

RECORDS.—Cayos de Sevilla/Cayo Rosalía/Cayo Arenoso, Cayo Cantiles (Garrido and Schwartz, 1969), Cayo Avalos, Cayo Matías/Cayo Real (Garrido, 1973b), Cayo Juan García (Varona and Garrido, 1970).

Family RECURVIROSTRIDAE

[*Himantopus mexicanus* (Müller)]

[Black-necked Stilt]

[RECORDS.—/ / /Cayo Majá (Varona, 1970), Cayo Cantiles (Garrido and Schwartz, 1969)/Cayo Juan García (Varona and Garrido, 1970).]

Family PHOENICOPTERIDAE

[*Phoenicopterus ruber* Linnaeus]

[Greater Flamingo]

[RECORDS.—/ /Jardines de la Reina (Garrido and García, 1975)/Cayo Pasaje (Garrido and Schwartz, 1969), Cayo Cantiles (Garrido and Schwartz, 1969, specimen)/ /.

REMARKS.—Garrido and Schwartz (1969) reported approximately 1000–3000 flamingos seen on Cayo Pasaje (northeast of Cayo Cantiles) during one of the Cuban Academy of Sciences expeditions in the mid-1960s. The birds were viewed through binoculars over a great distance as the vessel passed the island. According to local fishermen, flamingos feed there frequently but are not known to nest on the island.

Approximately 30 (adults and juveniles) also were seen on Cantiles during this expedition. Garrido and García (1975) indicate that flamingos are common in the Jardines de la Reina, but they do not mention specific records. To the best of our knowledge, there are no records of flamingos breeding on any of these southern cays.]

Family SCOLOPACIDAE

***Arenaria interpres* (Linnaeus)**

Ruddy Turnstone

RECORDS.—/ /Cayo Rosalía, cay west of Cachiboca (1M, 1F, 8 September, *A. i. morinella* [Linnaeus])/Cayo de la Piedra (Bond, 1950), Cayo Arenoso, Cayo del Rosario, Cayo Cantiles (Garrido and Schwartz, 1969), Cayo Avalos, Cayo Campos (Estrada and Rodríguez, 1985)/Cayo Real (Garrido, 1973b), Cayo Juan García (Varona and Garrido, 1970).

[*Tringa melanoleuca* (Gmelin)]

[Greater Yellowlegs]

[RECORDS.—Cayo Majá (Varona, 1970), Middle Majaes Cay (Bond, 1950).]

***Tringa solitaria* Wilson**

Solitary Sandpiper

RECORDS.—/ /Cayo Contra Punta/Cayo Cantiles (Garrido and Schwartz, 1969), Cayo Campos (Estrada and Rodríguez, 1985)/ /.

***Actitis macularia* (Linnaeus)**

Spotted Sandpiper

RECORDS.—Vicinity of Cayos Balandras (= Cayo Palmetto in Bartsch's journal)/Cabeza del Este, Cayo Contra Punta (1F, 7 September)/Cayo Largo and adjacent cays (Bond, 1950), Cayo Avalos (1M, 21 September), Cayo Campos (Estrada and Rodríguez, 1985)/Cayo Real (Garrido, 1973b), Cayo Juan García (Garrido, 1973b).

REMARKS.—Both specimens were subsequently identified by Roxie C. Laybourne as *A. m. macularia*, although some workers question the validity of dividing this species into eastern and western races.

***Catoptrophorus semipalmatus* (Gmelin)**

Willet

RECORDS.—Cayos de Sevilla/Jardines de la Reina (Garrido, 1978b)/Cayo Estopa (nest with eggs in June, Garrido and Schwartz, 1969), Cayo Cantiles (Garrido and Schwartz, 1969), Cayo Matías/Cayo Juan García (Varona and Garrido, 1970).

***Calidris alba* (Pallas)**

Sanderling

RECORDS.—/ /Cayo Arenoso, Cayo del Rosario (1M, 1F, 19 September), Cayo Matías (1M)/Cayo Real (Garrido, 1973b).

***Calidris pusilla* (Linnaeus)**

Semipalmated Sandpiper

RECORDS.—/ /Middle Majaes Cay (Bond, 1950), Cayo Matías/Cayo Juan García (Garrido, 1973b).

***Calidris melanotos* (Vieillot)**

Pectoral Sandpiper

RECORDS.—Cayo Matías (1F).

***Calidris minutilla* (Vieillot)**

Least Sandpiper

RECORDS.—Cayo Perla (1F), Cayos de Sevilla/Cayo Rosalía, cay at 78°33'W (1M), Cayo Arenoso (1M), Cayo del Rosario, Cayo Cantiles, Cayo Avalos, Cayo Campos (Estrada and Rodríguez, 1985), Cayo Matías (1F)/ /.

Family LARIDAE

[*Larus atricilla* Linnaeus]

[Laughing Gull]

[RECORDS.—/ /Jardines de la Reina (Garrido, 1978b)/Cayo Largo (Bond, 1950), Cayo Majá (Varona, 1970), Cayo Cantiles (Garrido and Schwartz, 1969, specimen[s]), Cayo Campos (Estrada and Rodríguez, 1985)/Cayo Juan García (Varona and Garrido, 1970).]

***Sterna anaethetus* Scopoli**

Bridled Tern

RECORDS.—/ / /At sea between Cayo Avalos and Cayo Matías, Cayo Campos (Estrada and Rodríguez, 1985)/ /.

***Sterna fuscata* Linnaeus**

Sooty Tern

RECORDS.—Cayo Perla/ /cays between Cayo Matías and Nueva Gerona (several in flight tentatively identified as this species 23 September)/ /.

***Sterna albifrons* Pallas**

Least Tern

RECORDS.—/ / /At sea between Cayo Avalos and Cayo Matías, Cayo Matías (1F juvenile, *S. a. antillarum* [Lesson]), cays between Cayo Matías and Nueva Gerona (23 September)/ /.

***Sterna maxima* Boddaert**

Royal Tern

RECORDS.—Vicinity of Cayos Balandras (= Cayo Palmetto in Bartsch's journal), Cayo Perla (many seen 2 September), Cayos de Sevilla, Cayo Rabihorcado, Cayo Blanco/Cabeza del Este, Cayo Contra Punta, Boca Juan Grin, Cayo Anclitas, Cayo Caballones, Cayo Grande/Cayo Largo (Bond, 1950), Cayos los Ballenatos (García and Garrido, 1965), Cayo Cantiles (Garrido and Schwartz, 1969), Cayo Avalos, Rum Cay, Cayo Matías, cays between Cayo Matías and Nueva Gerona (23 and 24 September)/Cayo Real (Garrido, 1973b), Cayo Juan García (Varona and Garrido, 1970).

***Sterna sandvicensis* Latham**

Sandwich Tern

RECORDS.—/ /Cayo Grande/Cayos los Ballenatos (García and Garrido, 1965), Cayo del Rosario, Cayo Cantiles, Rum Cay, cay west of Avalos, Cayo Matías, cays between Cayo Matías and Nueva Gerona (23 September)/ /.

REMARKS.—A colony was found nesting at Cayos los Ballenatos on 24 May 1965 and 22 eggs were collected (García and Garrido, 1965). This is the first documented breeding record of the species in the Antilles (Bond, 1966).

[*Sterna caspia* Pallas]

[Caspian Tern]

[RECORDS.—Cayo Real (Garrido, 1973b).]

***Chlidonias niger* (Linnaeus)**

Black Tern

RECORDS.—Cayo Perla (small flock tentatively identified as this species). This record requires corroboration.

Family COLUMBIDAE***Columba leucocephala* Linnaeus**

White-crowned Pigeon

RECORDS.—Cayo Rabihorcado (1F juvenile, many others seen), Cayo Loma, Cayo Blanco/Cabeza del Este, Cayo Rosalía, cay at 78°33'W (many seen 7 September), Boca Juan Grin, Cayo Cachiboca (4F [2 juveniles], recorded as very abundant), cay west of Cachiboca, Cayo Anclitas, Cayo Grande/Cayo Largo (Garrido and Schwartz, 1969), Cayo Arenoso, Cayo del Rosario, Cayo Cantiles (Bartsch, journal; Garrido and Schwartz, 1969), Cayo Campos (Estrada and Rodríguez, 1985)/Cayo Real (Garrido, 1973b), Cayo Juan García (Varona and Garrido, 1970).

[*Columba inornata* Vigors]

[Plain Pigeon]

[RECORDS.—Cayo Real (Garrido, 1973b).

REMARKS.—This species is rare and local in mainland Cuba and somewhat more numerous on the Isle of Pines (Garrido, 1973b). Elsewhere in the Cuban region it is known only from Cayo Real, where Garrido (1973b) considered the occurrence as not unexpected in view of the proximity of the islands to populations on the Guanahacabibes Peninsula and the Isle of Pines, and of the availability of suitable habitat and preferred foods (fruits of coco-plum and palmetto). Breeding has not been documented for Cayo Real.]

***Zenaida macroura* (Linnaeus)**

Mourning Dove

RECORDS.—Cayos de Sevilla, Cayo Rabihorcado (2M, Z. *m. macroura*), Cayo Loma/Jardines de La Reina (Garrido, 1978b)/ /.

***Zenaida aurita* (Temminck)**

Zenaida Dove

RECORDS.—Vicinity of Cayos Balandras (= Cayo Palmetto in Bartsch's journal)/ /Cayo Largo (Garrido and Schwartz, 1969), Cayo Cantiles (Garrido and Schwartz, 1969), Cayo Campos (Estrada and Rodríguez, 1985)/Cayo Real (Garrido, 1973b).

REMARKS.—Reported as the commonest dove on Cayo Cantiles by Garrido and Schwartz (1969), but unknown from most of the other islands off the southern coast of Cuba; only one seen on Cayo Real.

[*Zenaida asiatica* (Linnaeus)]

[White-winged Dove]

[RECORDS.—/ / /Cayo Largo (Garrido and Schwartz, 1969), Cayo Cantiles (Garrido and Schwartz, 1969), Cayo Campos (Estrada and Rodríguez, 1985)/ /.

REMARKS.—Only single individuals were seen on Cayo Largo and Cayo Cantiles. Barbour (1923) stated that this species was confined to the eastern end of Cuba. Garrido and García (1975) indicate that it was introduced into western Cuba in 1931 and is common in coastal woodlands, presumably island-wide. The "5 or 6" seen on the Isle of Pines in June 1959 by Charles M. Brookfield (Bond, 1963:10) apparently constitute the first record for that island.]

***Columbina passerina* (Linnaeus)**

Common Ground-Dove

RECORDS.—Cayos de Sevilla/ /Cayo Largo (Bond, 1950;

Garrido and Schwartz, 1969), Cayo Arenoso, Cayo del Rosario, Cayo Cantiles (1M, 1F; Garrido and Schwartz, 1969, specimens), Cayo Campos (Estrada and Rodríguez, 1985)/Cayo Real (Garrido, 1973b), Cayo Juan García (Varona and Garrido, 1970).

REMARKS.—These specimens do not differ from the subspecies found in mainland Cuba, *C. p. aflavida* (Palmer and Riley). Bond (1950) considered it rather rare on Cayo Largo, where he found a nest on 7 April, and he did not encounter *C. passerina* on any of the smaller adjacent cays. Garrido and Schwartz (1969), however, found the species to be common on Cayo Largo, and Garrido (1973b) regarded it as one of the most common birds in the Cayos de San Felipe. That there is no specimen or mention of this species from any of the Jardines de la Reina is extraordinary.

[*Geotrygon chrysis* Bonaparte]

[Key West Quail-Dove]

[RECORDS.—Cayo Cantiles (Garrido and Schwartz, 1969, specimen).

REMARKS.—Garrido collected three individuals and heard others. Only one specimen was preserved and this did not differ from mainland specimens.]

Family CUCULIDAE

Coccyzus minor (Gmelin)

Mangrove Cuckoo

RECORDS.—// /Cayo Largo (Garrido and Schwartz, 1969), Cayo Majá (Varona, 1970), Cayo Arenoso (1F), Cayo Cantiles (Garrido and Schwartz, 1969, specimen) //.

REMARKS.—Although rare in mainland Cuba, this species is stated to be common in the southern cays (Garrido and García, 1975). Bond (1956) treated Bartsch's specimen from "Sandy Cay, Havana" (= Cayo Arenoso) as belonging to the subspecies *C. m. maynardi* Ridgway, although it is cataloged as *C. m. nesiotis* Cabanis and Heine. Breeding populations of the latter occur on most of the major islands in the Greater Antilles except Cuba. *C. m. maynardi* breeds in Cuba, the Bahamas, and southern Florida. These subspecies are distinguished by slight differences in coloration that are most evident in series, *C. m. maynardi* being paler, less buffy, below. The specimen from Cayo Arenoso is darker than most examples of *C. m. maynardi*. Geographic variation in this species is in need of further study. At this time, we only report the somewhat problematical nature of these specimens.

[*Coccyzus americanus* (Linnaeus)]

[Yellow-billed Cuckoo]

[RECORDS.—// /Cayo Real (Garrido, 1973b, specimen).

REMARKS.—The specimen was very fat, which, with the

mid-October date, indicates that it was almost certainly a migrant, although the species does breed on mainland Cuba.]

[*Crotophaga ani* Linnaeus]

[Smooth-billed Ani]

[RECORDS.—// /Cayo Largo (Garrido and Schwartz, 1969), Cayo Cantiles (Garrido and Schwartz, 1969, specimen), Cayo Campos (Estrada and Rodríguez, 1985)/Cayo Juan García (Varona and Garrido, 1970).]

REMARKS.—This species is common in Cuba and the Isle of Pines (Garrido and García, 1975), but is scarce and has a spotty distribution in the southern cayerias. The Bartsch expedition recorded *C. ani* from mainland Cuba and the Isle of Pines, but not from the southern cays. Garrido and Schwartz (1969) suggested that the ani may be a recent arrival to some of these islands.]

Family CAPRIMULGIDAE

[*Caprimulgus carolinensis* Gmelin]

[Chuck-wills-widow]

[RECORDS.—Jardines de La Reina (Garrido, 1978b).]

Chordeiles minor (Forster)

Common Nighthawk

RECORDS.—/ /Cay east of Anclitas (1M, 2F, *C. m. minor*, see below).

Chordeiles gundlachii Lawrence

Antillean Nighthawk

RECORDS.—/ /Cay east of Anclitas (2M, 2F), Cayo Largo (Bond, 1950, heard; Garrido and Schwartz, 1969, female collected on one egg April 1966), Cayo Cantiles (Garrido and Schwartz, 1969, heard), Cayo Campos (Estrada and Rodríguez, 1985) //.

Chordeiles sp.

Nighthawk species

RECORDS.—/ /Cabeza del Este/East Majaes Cay (Bond, 1950—flushed and thought to be *gundlachii*) //.

REMARKS.—We follow Eisenmann (1962) and Stevenson et al. (1983) in treating the breeding populations in the West Indies, and some of those in the Florida keys, as a distinct species, *C. gundlachii* Lawrence, the vocalizations of which are very distinct from those of *C. minor* of continental North America. Both species are represented in the series that Bartsch collected on 8 September on the cay east of Anclitas. The four specimens of *C. gundlachii* had been identified as the Bahaman race *C. g. vicinus* Riley. That all the birds collected at this time were migrants is not at all unlikely.

There is some question as to the name of the island whence these specimens were taken. The journal indicates that eight nighthawks were collected on a cay south of Anclitas Cay on 8 September, whereas the catalog and all specimen labels indicate that seven nighthawks were taken "in the passage east of Ancilote [sic] Cay." Almost certainly these are one and the same series (Figure 3E,E' and discussion of localities 14 and 15, above.)

Family TROCHILIDAE

Chlorostilbon ricordii (Gervais)

Cuban Emerald

RECORDS.—/ /Cabeza del Este (1F, "10 September," see below), Cayo Contra Punta, cay at 78°33'W (1M), cay east of Anclitas (1M), Cayo Anclitas, Cayo Grande (1M, 9 September)/Cayo Largo and adjacent cays (Bond, 1950, specimen), Cayo Majá (Varona, 1970), Cayo de la Piedra (Garrido and Schwartz, 1969), Cayo Cantiles (Burleigh and Duvall, specimen lost; Garrido and Schwartz, 1969, specimens), Cayo Avalos (2M), Cayo Campos (Estrada and Rodríguez, 1985)/Cayo Real (Garrido, 1973b), Cayo Juan García (Varona and Garrido, 1970).

REMARKS.—The specimens do not differ from *C. ricordii* of the Cuban mainland and Bahamas. The species is now regarded as monotypic (Graves and Olson, 1987). Specimen labels and the catalog indicate that the specimen from Cabeza del Este was taken 10 September, but the journal indicates that the expedition was there on 6 and 7 September and was at Cayo Grande on the 10th. This species was noted as abundant in Cayos de San Felipe (Garrido, 1973b) and as extremely common on almost all of the cays of Cuba (Garrido and Schwartz, 1969). A nest containing one egg was observed on Cayo Cantiles, 12 April (Garrido and Schwartz, 1969).

Family HALCYONIDAE

Ceryle alcyon (Linnaeus)

Belted Kingfisher

RECORDS.—/ /Cabeza del Este/Cayo Arenoso, Cayo Cantiles, Cayo Matías, cays between Cayo Matías and Nueva Gerona (23 September)/ /.

Family PICIDAE

Melanerpes superciliaris (Temminck)

West Indian Red-bellied Woodpecker

RECORDS.—/ /Cayo Largo (Garrido, 1966, specimens; Garrido and Schwartz, 1969), Cayo Arenoso, Cayo Cantiles (Garrido and Schwartz, 1969, specimens), Cayo Avalos (1M), /Cayo Real (Garrido, 1973b, specimens).

SPECIMENS EXAMINED (all males).—CUBA (by province):

Pinar del Río, USNM (2); Matanzas, MCZ (1), USNM (2), YPM (1); Villa Clara, MCZ (4), USNM (2), YPM (2); Camagüey USNM (2); Granma, USNM (1); Holguín, MCZ (5), USNM (1); Santiago de Cuba, MCZ (1), Guantánamo, USNM (6). ISLE OF PINES: MCZ (6), USNM (9), YPM (7). ARCHIPIÉLAGO DE LOS CANARREOS: Cayo Avalos, USNM (1).

REMARKS.—This species, which has three races in the Bahamas and another in the Cayman Islands, also exhibits geographic variation within Cuba. Birds from the Isle of Pines (*M. s. murceus* Bangs) are decidedly smaller than the nominate form from mainland Cuba (Table 1; Garrido, 1973b). Curiously, the birds on Cayo Cantiles are larger than on the Isle of Pines and have been referred to *M. s. superciliaris* (Garrido and Schwartz, 1969; Garrido, 1973b).

Two other subspecies have been named from the southern cays; *M. s. florentinoi* Garrido (1966) from Cayo Largo, and *M. s. sanfelipensis* Garrido (1973b) from Cayo Real. Garrido (1966) characterized *M. s. florentinoi* as having the wing somewhat longer than in *M. s. murceus* but shorter than in *M. s. superciliaris*, whereas the bill and tarsus were smaller than in either. His measurements for *M. s. florentinoi* in the original description do not correspond closely with those he gave later (Garrido, 1973b), which has made our comparisons difficult. Short (1982) considered both of these to be synonymous with *M. s. murceus* but probably in the absence of specimens of either for comparison. Nor have we seen material of these races, for which reason we do not feel compelled to speculate on their validity, except to say that the interpolation of a population of nominate *M. s. superciliaris* on Cayo Cantiles, between Cayo Largo and the Isle of Pines, would make it unlikely that the populations on those two islands would belong to the same subspecies.

Bartsch encountered *M. superciliaris* twice in the southern cays. His sighting on the mysterious Cayo Arenoso may be taken as possible evidence that he was on Cayo Largo, where the species is known to occur, but may also indicate a population on an island where the species has not otherwise been recorded (see locality 19). In the specimen from Cayo Avalos, which is the only record for that island, the culmen is shorter than in any of 22 males of *M. s. murceus*, the wing length is exceeded by only 1 of 22, and the tail length is exceeded by only 5 of 20 (Table 1). It is in rather poor condition, with much black of the immature plumage remaining in the crown, and so is not ideal for color comparisons. Nevertheless, it is markedly paler below than in *M. s. murceus*, the yellow wash on the dorsum is decidedly less pronounced, and the barring on the back and wings appears wider. The Avalos specimen is sufficiently distinct in size and coloration as to suggest that it may represent an endemic form. It would certainly seem to be very different from the nearest known population on Cayo Cantiles, which has been referred to the nominate race.

Melanerpes superciliaris is common in woodlands and orchards on mainland Cuba and the Isle of Pines (Bond, 1956; Garrido and García, 1975). On the southern cays (Largo,

TABLE 1.—Measurements (mm) of males of *Melanerpes superciliaris* from the Cuban region. (Sequence is mean \pm standard deviation, (N), range.)

Locality	Wing length		Tail length		Bill length	
Cuba (western ¹) (<i>M. s. superciliaris</i>)	150.4 \pm 3.9	(13) 144–156	97.9 \pm 3.8	(12) 90.8–105.2	38.0 \pm 2.1	(14) 34.1–42.1
Cuba (eastern ²) (<i>M. s. superciliaris</i>)	151.0 \pm 4.5	(15) 142–159	101.1 \pm 3.6	(14) 96.4–107.9	38.5 \pm 1.4	(15) 36.9–42.6
Isle of Pines (<i>M. s. murceus</i>)	137.5 \pm 3.2	(22) 132–144	90.5 \pm 4.5	(20) 79.5–96.5	36.3 \pm 1.5	(22) 33.3–39.0
Cayo Avalos (subsp.?)	134.0	(1)	87.8	(1)	29.9	(1)

¹Pinar del Río, Matanzas, and Villa Clara provinces.

²Granma, Holguín, Santiago de Cuba, and Guantánamo provinces.

Cantiles, and Real), however, it is uncommon and seldom seen away from palms—chiefly *Coccothrinax* and, at least on Cayo Real, *Cocos* (Garrido, 1966, 1973b; Garrido and Schwartz, 1969). The species apparently was more numerous on Cayo Real before the loss (dieoff?) there of thousands of coconut trees (Garrido, 1973b).

Estrada and Rodríguez (1985) noted the workings of some species of woodpecker on the trunks of casuarinas and palmettos on Cayo Campos, but this may well have been the winter resident Yellow-bellied Sapsucker, *Sphyrapicus varius*, a species not yet recorded from the southern cayerias, probably because most field work was conducted at the wrong time of year to encounter it.

Xiphidiopicus percussus (Temminck)

Cuban Green Woodpecker

RECORDS.—/Cabeza del Este (3M, 2F, 6 September; 1F, 7 September), Cayo Rosalía (2M—one exchanged to Vienna), cay at 78°33'W, cay west of Cachiboca (1F), Cayo Anclitas (1M), Cayo Caballones/Cayo Cantiles (1M, 21 September; also Garrido and Schwartz, 1969, specimens)/ /.

SPECIMENS EXAMINED: CUBA (by province): Pinar del Río MCZ (2M, 1F), USNM (4M, 4F); La Habana USNM (1M, 1F); Matanzas [probably, but labeled only as from "Ciénaga de Zapata"], MCZ (5M, 3F); Cienfuegos, MCZ (1F); Villa Clara MCZ (3M, 1F), USNM (1M), YPM (2M, 4F); Sancti

TABLE 2.—Measurements (mm) of *Xiphidiopicus percussus* from mainland Cuba (4 samples listed geographically from northwest to southeast), and from islands off the southern coast. (Sequence is mean \pm standard deviation, (N), range. Three unexpectedly very small individuals from the mainland are not included in the table, but are discussed in the text. Corrections on museum labels indicate several specimens probably were originally missexed. In cases where the original identification is questioned or lacking, specimens with the anterior part of the crown black with pronounced narrow white streaks are considered females and those with the crown predominately red, males.)

Locality	Sex	Wing length		Tail length		Bill length	
Cuba (western ¹)	M	121.3 \pm 2.9	(6) 117–125	84.4 \pm 1.9	(6) 81.5–86.6	24.9 \pm 0.90	(6) 23.8–25.9
Cuba (central ²)	M	122.0 \pm 2.9	(17) 117–128	86.1 \pm 4.6	(17) 77.8–94.8	24.3 \pm 1.00	(19) 23.0–26.7
Cuba (eastern ³)	M	122.0 \pm 3.2	(4) 118–125	89.6 \pm 2.7	(4) 85.7–91.9	24.5 \pm 1.20	(4) 23.3–26.1
Cuba (eastern ⁴)	M	125.9 \pm 5.3	(11) 120–137	90.0 \pm 3.3	(11) 85.7–95.0	24.5 \pm 1.44	(11) 21.5–26.3
Isle of Pines	M	110.7 \pm 2.5	(16) 106–115	76.6 \pm 2.2	(16) 72.1–80.8	23.2 \pm 1.01	(16) 21.6–25.8
Cayo Cantiles	M		(1) 108		(1) 74.7		(1) 21.4
Jardines de la Reina	M	108.6 \pm 1.8	(5) 107–111	77.6 \pm 2.7	(5) 73.0–79.3	20.5 \pm 2.75	(5) 17.1–23.9
Cuba (western ¹)	F	116.9 \pm 4.3	(7) 112–124	82.3 \pm 4.3	(7) 79.3–90.2	19.4 \pm 1.32	(7) 17.2–21.0
Cuba (central ²)	F	116.3 \pm 4.2	(12) 111–124	85.4 \pm 4.3	(12) 78.5–94.0	20.1 \pm 1.09	(12) 18.9–21.8
Cuba (eastern ³)	F	118.7 \pm 1.9	(6) 117–121	88.6 \pm 2.8	(6) 86.1–93.8	20.4 \pm 0.68	(6) 19.8–21.5
Cuba (eastern ⁴)	F	122.4 \pm 3.0	(14) 117–126	90.0 \pm 4.0	(13) 80.4–94.9	20.2 \pm 1.16	(13) 18.0–22.0
Isle of Pines	F	108.1 \pm 2.4	(14) 103–111	78.2 \pm 3.5	(14) 73.0–84.9	19.6 \pm 1.05	(14) 18.2–21.7
Cayo Cantiles	F		(1) 105		(1) 79.3		(1) 20.0
Jardines de la Reina	F	105.5 \pm 2.4	(4) 103–108	76.7 \pm 1.4	(4) 75.8–78.7	17.3 \pm 0.79	(3) 16.4–17.9

¹Pinar del Río and La Habana provinces.

²Matanzas, Cienfuegos, Villa Clara, Sancti Spiritus, and Camagüey provinces.

³Granma and Holguín provinces.

⁴Guantánamo Province.

Spiritus, USNM (1M), YPM (1M); Camagüey, MCZ (2M, 1F), USNM (3M, 2F); Granma, MCZ (1F), USNM (1F); Holguín, MCZ (3M, 2F), USNM (1M, 2F), YPM (1F); Santiago de Cuba, USNM (1F); Guantánamo, MCZ (1M), USNM (11M, 14F); Province uncertain: ("Rio de Hanabana" forms parts of the borders of Matanzas, Cienfuegos, and Villa Clara provinces) MCZ (1M, 1F). ISLE OF PINES: MCZ (9M, 6F), USNM (3M, 4F), YPM (4M, 4F). ARCHIPIÉLAGO DE LOS JARDINES DE LA REINA: Cabeza del Este, USNM (3M, 3F); Cayo Rosalía, USNM (1M); cay west of Cachiboca, USNM (1F); Cayo Anclitas, USNM (1M). ARCHIPIÉLAGO DE LOS CANARREOS: Cayo Cantiles, USNM (1M), CM (1F, paratype).

REMARKS.—There is a great deal of geographic variation in this species, more than has traditionally (Bond, 1956) or recently (Short, 1982) been recognized. The first subspecies to be described was *X. p. insulaeipinorum* Bangs (1910) from the Isle of Pines. Garrido (1971b) revised the species and described as new *X. p. monticola*, said to be confined to high elevations of Las Cuchillas de Toa and possibly the Sierra del Cristal and Sierra del Purial in eastern Cuba, and *X. p. gloriae*, restricted to Cayo Cantiles. Regalado (1977b) purportedly named another race, *X. p. marthae*, from Cayo Caballones, in the Jardines de la Reina archipelago, and another insular race, *X. p. cocoensis* was described from Cayo Coco, off the northern coast of Camagüey, by Garrido (1978a). We have not seen material of *X. p. cocoensis* and so cannot comment on its validity. Short (1982) recognized only *X. p. insulaeipinorum*, in which he included *X. p. gloriae*, while lumping *X. p. monticola* with nominate *X. p. percussus*.

Among mainland examples, those from extreme eastern Cuba (Guantánamo Province) average larger than specimens taken elsewhere on the island (Table 2). We have not seen material from higher elevations, in the range ascribed to *monticola*, although the measurements of some of the birds from Guantánamo and vicinity fall within those given by Garrido (1971b) for that race, which is said to be larger and more brightly colored than the nominate form. A male (MCZ 17356) taken at Monte Verde in the Meseta del Guaso area in northern Guantánamo Province is the largest specimen examined, at least in wing length (137 mm) and bill length (26.3 mm), but a female (YPM 33521) taken at an elevation of 2400 feet at Frank Crest, in the Sierra del Cristal, eastern Holguín Province, is similar in size (wing 117 mm, tail 87.0 mm, culmen 19.8 mm) to those taken at lower elevations. Neither specimen is chromatically distinct from lowland birds although they are among the more brightly colored.

Birds from the Isle of Pines (*X. p. insulaeipinorum*) are slightly but consistently smaller than those of the mainland; the males are completely separated by wing length, and the females nearly so (excluding the three anomalous mainland birds discussed below). The differences in coloration (Bangs, 1910; Todd, 1916; Garrido, 1971b) are not so clear, but when

adequate series are compared, the birds from the Isle of Pines are distinctly paler ventrally (the ground color more extensive, the yellow less vivid and more nearly confined to the midline) than those from the mainland.

Garrido (1971b) characterized *X. p. gloriae* from Cayo Cantiles mainly as being smaller than any other forms of the species, with paler, less yellow underparts and the throat patch more restricted and darker red than in *X. p. insulaeipinorum*. Regalado's (1977b) diagnosis of *X. p. marthae* is practically identical to Garrido's for *X. p. gloriae*, which race Regalado does not mention, the only comparisons being with *X. p. insulaeipinorum*. The series from the Bartsch expedition includes one specimen from Cayo Cantiles (*X. p. gloriae*) and 10 (one exchanged to the Naturhistorisches Museum in Vienna) from the Jardines de la Reina archipelago, which would supposedly be referable to *X. p. marthae*. (Bartsch recorded *Xiphidiopicus* at the type locality of *X. p. marthae* on Cayo Caballones but did not collect it there). The birds from both archipelagos are markedly smaller than any other populations of the species (Table 2). They also appear paler below, with less yellow on the belly and more restricted red on the throat. The Bartsch specimens are so worn and poorly made, however, that it is difficult to be certain that the color differences are constant. Neither with the material at hand, nor with Regalado's (1977b) description, is it possible to make a certain distinction between the specimens from Cayo Cantiles and those from the Jardines de la Reina, although the former two appear somewhat more heavily streaked below. Thus for the present, we would have to regard *X. p. marthae* Regalado as a synonym of *X. p. gloriae*, which is a well marked valid subspecies, contra Short (1982). However, because the two archipelagos in which the small, pale birds occur were never directly connected to one another (see "Discussion"), we would have to assume that the two populations evolved their characters independently from one another, so that adequate series of fresh specimens might still reveal differences between them.

Three specimens from the mainland are unusually small, at least in wing length. There are two Bartsch specimens that on size and color would clearly have to be referred to *X. p. gloriae* (sensu lato) that are either mislabelled or indicate that this form strays to the mainland (or is resident there?). One of these (USNM 323539) is a male labelled as having been taken at Guantánamo Bay on 14 August 1930, and the other (USNM 323535) a female from Manzanillo (Granma Province), 3 September 1930. In length of wing, tail, and bill, they measure 114/118, 84.1/76.4, and 18.3/18.8 mm, respectively. The third specimen is a male (MCZ 46669) collected by H. Bryant near the north coast at Remedios in eastern Villa Clara Province. It has an extremely short wing (112 mm), but in tail length (84.8 mm) and bill length (23.3 mm), and in coloration, it falls within the range of variation of other males from central Cuba.

Family TYRANNIDAE

Tyrannus tyrannus (Linnaeus)

Eastern Kingbird

RECORDS.—Cays between Cayo Matías and Nueva Gerona (1M, juvenile).

Tyrannus dominicensis (Gmelin)

Gray Kingbird

RECORDS.—Vicinity of Cayos Balandras (Cayo Palmetto in Bartsch's journal), Cayo Rabihorcado (1F)/Cabeza del Este, Cayo Rosalía (1M), cay at 78°33'W, Boca Juan Grín, Cayo Cachiboca, cay west of Cachiboca, Cayo Anclitas, Cayo Caballones (1F), Cayo Grande/Cayo Largo (Bond, 1950; Garrido and Schwartz, 1969), Cayo Majá (Varona, 1970), Cayo de la Piedra (Bond, 1950, specimen), Cayo Arenoso, Cayo Cantiles (Bartsch journal; Garrido and Schwartz, 1969, specimens[s]), Cayo Avalos, Cayo Campos (Estrada and Rodríguez, 1985), Cayo Matías/.

REMARKS.—All the specimens are referable to the nominate subspecies. Bond (1950) reported that Gray Kingbirds seen on Cayo Largo and adjacent islands 3–9 April 1948 were just arriving, apparently from wintering grounds to the south. That the Cayos de San Felipe were surveyed only in October and February, when the birds would have been on their wintering grounds, may explain the lack of records from these islands.

Tyrannus caudifasciatus d'Orbigny

Loggerhead Kingbird

RECORDS.—Cayo Loma (1F), Cayo Blanco (1M), Cayo Playa Blanca (1M)/Cabeza del Este (1M, 6 September), cay at 78°33'W (1M), Cayo Grande (1M, 9 September)///.

REMARKS.—Although Parkes (1963) treated the birds from the Isle of Pines as a separate subspecies, *T. c. flavescens*, this is a weakly differentiated form, the characters of which are apparent only in specimens that are not worn or faded. Bartsch's specimens from the eastern islands of the southern cayerias would not be expected to be referable to the race from the Isle of Pines in any case and we refer them to the nominate subspecies. The apparent absence of this species from the Canarreos and Cayos de San Felipe is most curious, especially in view of records from much smaller and more remote islands in the Golfo de Guacanayabo and the widespread distribution of the species elsewhere in the Antilles and in the northern Bahamas. The possibility that it would escape notice during the several different expeditions to Cayo Cantiles, if it occurred on that island, seems unlikely.

Myiarchus sagrae (Gundlach)

La Sagra's Flycatcher

RECORDS.—/Cayo Rosalía (1 specimen, unsexed), Cayo Anclitas (1M), Cayo Caballones (1M)/Cayo Largo (Bond, 1950; Garrido and Schwartz, 1969, specimen), Cayo Majá

(Garrido and Schwartz, 1969; Varona, 1970), Cayeria los Majaes (Bond, 1950) including Middle Majaes Cay (Bond, 1950, specimen), Cayo Estopa (Garrido and Schwartz, 1969, specimen), Cayo Cantiles (1M, 20 September; 1 M, 1F, Burleigh and Duvall; Garrido and Schwartz, 1969, specimens), Cayo Avalos (1M, 21 September), Cayo Campos (Estrada and Rodríguez, 1985)/Cayo Real (Garrido, 1973b, specimens), Cayo Juan García (Varona and Garrido, 1970, specimen).

REMARKS.—*Myiarchus sagrae* occupies a wide range of habitats on the southern cays. It is common in the Cayos de San Felipe in mangroves, in densely wooded areas, and in coastal scrub (Garrido, 1973b; Varona and Garrido, 1970), and is common also in Cantiles in woodlands, but is scarce and apparently confined to coastal mangroves on the adjacent cays of Estopa, Majá, and Largo (Garrido and Schwartz, 1969).

Bartsch's specimens from the Jardines de la Reina are all very pale below, with no hint of yellow on the belly despite being in fresh plumage. His specimen from Cayo Cantiles is paler than those taken later on the same island by Burleigh and Duvall, so Bartsch's specimens may have suffered from postmortem fading. There are other slight differences in both size and coloration among samples from different islands (Garrido and Schwartz, 1969), but for the present, all specimens from the Cuban region, along with those of the Cayman Islands, can be referred to the race *M. s. sagrae*.

Separation of *Myiarchus sagrae* from *M. stolidus* (Gosse) follows Lanyon (1967).

Contopus caribaeus (d'Orbigny)

Greater Antillean Pewee

RECORDS.—/Cabeza del Este (1F, 6 September; 1F, 7 September), Cayo Rosalía (1F, 1 unsexed), Cayo Las Cruces (Garrido, 1978b, specimens), Cayo Anclitas (Bartsch collection, 1 unsexed; Regalado, 1977a), Cayo Grande (1F, 9 September)/Cayo Largo and nearby cays (Bond, 1950) including Cayo de la Piedra (Bond, 1950, specimen) and Cayo Majá (Garrido and Schwartz, 1969, specimen[s]; Varona, 1970), Cayo del Rosario (2M, 1F, holotype and 2 paratypes of *C. c. morenoi* Burleigh and Duvall [1 given to University of Havana]; Garrido, 1978b), Cayo Cantiles (1M, 20 September; Garrido and Schwartz, 1969, specimens), Cayo Campos (Estrada and Rodríguez, 1985 [assigned to *C. c. morenoi*])/Cayo Real (Garrido, 1973b, specimens), Cayo Juan García (Varona and Garrido, 1970, specimens). Regalado (1977a) says this species is absent from Cayo Caballones.

SPECIMENS EXAMINED.—CUBA (by province): Pinar del Río USNM (11M, 5F); La Habana, MCZ (2M, 3F); Matanzas, MCZ (3M), USNM (2M, 2F); Cienfuegos, USNM (1F); Villa Clara MCZ (2M, 2F), USNM (1F), YPM (3M, 3F); Sancti Spiritus USNM (1M, 3F); Granma, USNM (1F); Holguín, MCZ (1M), USNM (3M, 1F), YPM (1F); Santiago de Cuba, MCZ (5M, 1F), USNM (1F); Guantánamo, MCZ (2F), USNM (5M, 8F). ISLE OF PINES: MCZ (4M, 5F), USNM (4M, 1F), YPM (1M, 2F). ARCHIPIÉLAGO DE LOS CANARREOS: Cayo del

TABLE 3.—Measurements (mm) of *Contopus caribaeus* from mainland Cuba and islands off the southern coast. (Sequence is mean \pm standard deviation, (N), range.)

Locality	Sex	Wing length			Tail length			Bill length		
		Mean	SD	Range	Mean	SD	Range	Mean	SD	Range
Cuba (western ¹)	M	73.4 \pm 1.5	(14)	71–75	65.7 \pm 1.5	(13)	62.6–68.5	14.4 \pm 0.56	(15)	13.6–15.8
Cuba (central ²)	M	73.0 \pm 2.1	(8)	70–76	64.5 \pm 2.5	(8)	60.0–66.8	14.4 \pm 0.50	(9)	13.8–15.1
Cuba (eastern ³)	M	74.1 \pm 1.6	(14)	72–78	64.3 \pm 2.5	(14)	60.2–68.5	14.2 \pm 0.92	(14)	13.2–16.1
Isle of Pines	M	71.9 \pm 2.0	(7)	69–74	63.1 \pm 2.2	(7)	60.9–66.4	14.3 \pm 0.39	(8)	13.5–14.8
Los Canarreos	M	71.5	(2)	71–72	63.4	(2)	62.4–64.3	14.5	(2)	14.4–14.6
Jardines de la Reina	?	71.0	(2)	70–72	65.5	(2)	65.2–65.8	13.8	(2)	13.7–13.8
Cuba (western ¹)	F	70.9 \pm 1.8	(10)	68–74	65.3 \pm 1.6	(10)	62.3–68.2	13.7 \pm 0.60	(9)	13.0–14.7
Cuba (central ²)	F	71.0 \pm 3.2	(10)	67–77	64.5 \pm 2.2	(8)	61.4–67.4	14.4 \pm 0.78	(11)	13.1–16.0
Cuba (eastern ³)	F	70.1 \pm 2.7	(14)	68–76	61.8 \pm 3.5	(14)	56.0–67.4	13.7 \pm 0.75	(12)	12.5–14.8
Isle of Pines	F	69.5 \pm 2.1	(8)	66–72	63.7 \pm 3.0	(8)	58.4–65.2	13.4 \pm 0.71	(8)	13.0–15.0
Jardines de la Reina	F	69.0 \pm 1.6	(4)	67–71	60.9 \pm 2.00	(4)	57.9–62.5	14.1 \pm 1.76	(3)	12.5–16.0

¹Pinar del Río and La Habana provinces.

²Matanzas (excluding the south coast where *C. c. morenoi* has been recorded locally in mangroves), Cienfuegos, Villa Clara, and Sancti Spíritus provinces.

³Granma, Holguín, Santiago de Cuba, and Guantánamo provinces.

Rosario, USNM (2M); Cayo Cantiles, USNM (1M). ARCHIPIÉLAGO DE LOS JARDINES DE LA REINA: Cabeza del Este, USNM (2F); Cayo Rosalía, USNM (1F, 1 unknown sex); Cayo Anclitas, USNM (1 unknown sex); Cayo Grande, USNM (1F).

REMARKS.—Garrido and García (1975) give the habitat of this species as woodlands and mangroves. According to Burleigh and Duvall (1948:167), *C. c. morenoi* "is confined almost entirely to the mangroves," but Garrido (1978b) reported it from other (unspecified) habitats on Cayo Largo and Cayeria los Majaes. Garrido and Schwartz (1969) reported it in woodlands, but not in mangroves, on Cantiles. Garrido (1973b:28) found *C. c. sanfelipensis* in "todos los habitats," though chiefly in mangroves, on Cayo Real and Cayo Juan García.

Differences between populations of *C. caribaeus* in Cuba are solely in color, as there are no appreciable differences in size (Table 3). The nominate form of this species has been considered to occupy almost the entire mainland of Cuba. Burleigh and Duvall (1948) described a new form, *C. c. morenoi* (type locality, Cayo del Rosario), ascribing to it a range including islands in the Canarreos and Jardines de la Reina archipelagos as well as on the mainland at the mouth of the Río Hatiguanico at the entrance to the Zapata Swamp. They regarded this to be a mangrove form, whereas farther in the swamp the nominate form occurs.

Garrido (1973b) described *C. c. sanfelipensis* from the Cayos de San Felipe, which from his description sounds rather intermediate between the two previously named forms, although said to be more similar to *C. c. caribaeus*. We have not seen material of this subspecies and can offer no opinion on it. Garrido (1978b) next described a new subspecies, *C. c. nerlyi* from Cayo Las Cruces in the Jardines de la Reina group, thus effectively splitting *morenoi*, as defined by Burleigh and Duvall, in two. Regalado (1977b) also purportedly named a subspecies, *C. c. florentinoi*, from the Jardines de la Reina (type

locality, Cayo Anclitas), which doubtless refers to the same race as *C. c. nerlyi*. However, we have not been able to ascertain the actual date of publication of Regalado's description (see Appendix), and there is reason to doubt that it really has priority over Garrido's name *nerlyi*. Regalado's description is puzzling, as he states (1977a:40) that the underparts are almost white, which certainly does not fit with our series of 5 specimens from the Jardines de la Reina, including one topotype of "*florentinoi*."

To understand the variation in the southern cays, we must first clarify the extent of variation on the mainland. Burleigh and Duvall (1948:168) considered that: "Specimens of *C. c. caribaeus* from western Cuba (Pinar del Río Province) are identical with those examined from eastern Cuba (Oriente Province), and since d'Orbigny (in La Sagra's Hist. Isla de Cuba, Aves, 1839:77) did not designate a type specimen, we arbitrarily restrict the type locality of the nominate race to the vicinity of Holguín in Oriente Province, Cuba."

We found, however, that a large series from Guantánamo from the Ramsden collection, which was not cataloged at USNM until 1953 and would not have been available to Burleigh and Duvall, is very distinct from the birds in western Cuba in Pinar del Río and Matanzas. The eastern birds are much brighter and more extensively buffy ventrally and not so heavily suffused with gray on the chest and flanks, the wing bars are more pronounced, and the dorsum is decidedly paler, more greenish as opposed to dark grayish brown, with the cap much better defined. This form, which probably deserves nomenclatural recognition, appears to be restricted to easternmost Cuba and the designation of Holguín as the type locality may thus be unfortunate, as the few birds available from there appear decidedly as if they are intergrades between the eastern and western forms. We would prefer to examine more material from a greater variety of localities and taken at different times of year before reaching any firm conclusions on this. For

example, the Guantánamo birds were all taken in the fall, whereas almost all the others examined, except Bartsch's specimens from the islands, were taken in spring. But the differences between the Guantánamo birds and those from Pinar del Río, for example, appear much too great to be purely seasonal.

The two insular forms both show a parallel reduction in the amount of yellow or buff in the underparts and hence are grayer than their mainland counterparts. Thus because the western mainland birds are darker, their presumed derivative, *C. c. morenoi*, is darker than *C. c. nerlyi*, which is presumably derived from the more brightly colored eastern birds. For the present, we recognize both *C. c. morenoi* and *C. c. nerlyi* as valid.

Family HIRUNDINIDAE

Riparia riparia (Linnaeus)

[Bank Swallow]

[RECORDS.—/ / Cayo Largo (Garrido and Schwartz, 1969), Cayo Majá (Varona, 1970) / .]

Hirundo rustica Linnaeus

Barn Swallow

RECORDS.—/ / Cabeza del Este (1F, 6 September), Cayo Cachiboca, cay west of Cachiboca, cay east of Anclitas, Cayo Caballones/Cayo Largo (Bond, 1950; Garrido and Schwartz, 1969), Cayo Majá (Varona, 1970), Cayo Arenoso, Cayo del Rosario, Cayo Cantiles (Garrido and Schwartz, 1969), Cayo Avalos (1F), Rum Cay, Cayo Campos (Estrada and Rodríguez, 1985)/Cayo Juan García (Garrido, 1973b).

REMARKS.—Records are from April to mid-June and from September–October coincident with spring and fall migration. Garrido and Schwartz (1969) mention two specimens collected in the Canarreos, but did not state whether from Cayo Largo or Cayo Cantiles.

Family MIMIDAE

Mimus polyglottos (Linnaeus)

Northern Mockingbird

RECORDS.—/ / Cayo Largo (Bond, 1950; Garrido and Schwartz, 1969), Cayo Arenoso, Cayo Cantiles (Garrido and Schwartz, 1969), Cayo Campos (Estrada and Rodríguez, 1985)/Cayo Real (Garrido, 1973b), Cayo Juan García (Varona and Garrido, 1970).

REMARKS.—The distribution of *M. polyglottos* among these cays is both spotty and seemingly limited to scrubland and sparsely vegetated areas. Garrido and Schwartz (1969) described this as one of the most common birds on Cayo Largo. Bond (1950) saw several in scrublands on Cayo Largo, but none on the adjacent cays. Garrido and Schwartz (1969) reported no more than two pairs seen in the sparse coastal

vegetation on Cayo Cantiles, and none in woodlands. Garrido (1973b) attributed the apparent scarcity of this species in the Cayos de San Felipe (only one or two pairs each on Cayo Real and Cayo Juan García) to lack of suitable habitat.

[*Dumetella carolinensis* (Linnaeus)]

[Catbird]

[RECORDS.—/ / Cayo Largo (Bond, 1950), Cayo Cantiles (Garrido and Schwartz, 1969)/Cayo Juan García (Varona and Garrido, 1970).

REMARKS.—Only one seen at each locality.]

Family MUSCICAPIDAE

Turdus plumbeus Linnaeus

Red-legged Thrush

RECORDS.—/ / Cayo Caballones (1M)/Cayo Cantiles (Garrido and Schwartz, 1969, specimens) / .

REMARKS.—According to Garrido and Schwartz (1969), the six specimens collected by Garrido on Cayo Cantiles are indistinguishable from *T. p. rubripes* Temminck of western Cuba, the Isle of Pines, and Swan Island (where now extirpated, Bond, 1956).

The very interesting specimen from Cayo Caballones constitutes the only record of this species from the Jardines de la Reina. The bird is an adult in very heavy molt; almost the entire head is in pinfeathers and most of the rectrices are only half or less grown. To add to its miseries, the upper portion of the bill is broken and bent to one side. In coloration, it is clearly most similar to *T. p. rubripes*, although the tawny part of the belly is not so extensive nor so richly colored as in most examples of that race. Furthermore, the bill is pale rather than black, probably having been orangish in life, as in *T. p. schistaceus* Baird of eastern Cuba, and it appears longer and more slender than in Cuban birds. In all these respects the Caballones specimen resembles *T. p. coryi* (Sharpe) of Cayman Brac, from which in its present state it can scarcely be distinguished. Bartsch definitely mentions this species on Cayo Caballones in his journal and does not mention it in the accounts of the expedition's visit to Cayman Brac, Cayman Islands, so the specimen is clearly not mislabelled.

A possible explanation for the appearance of this specimen is that the population of Cayo Caballones (if such it is or was) was derived from birds in a zone of intergradation between *T. p. rubripes* and *T. p. schistaceus*, as the bird closely resembles such intergrades. It is of interest, however that the present zone of intergradation on the Cuban mainland is considerably farther to the east of Cayo Caballones, approximately in a line from Gibara to Cabo Cruz according to Garrido and García (1975), although there are intermediate specimens in the Smithsonian collection from even farther east (e.g., a series from Guamá, in extreme western Santiago de Cuba Province). This would imply that the Caballones population is a relictual one, with

the zone of intergradation having moved eastward since the island was colonized, which further implies that *T. p. rubripes* may be swamping out and replacing *T. p. schistaceus*. Another explanation, involving greater time constraints, is that the Caballones bird and *T. p. coryi* of Cayman Brac represent relicts of the original Cuban stock of *Turdus plumbeus* before it gave rise to east/west differentiates, although this would imply a very young age for the two mainland subspecies. Needless to say, more specimens from Cayo Caballones would be highly desirable, although Regalado (in litt. to Olson, 19 November 1984) did not encounter the species there, raising the possibility that it may now be extinct on the island.

Family BOMBYCILLIDAE

[*Bombycilla cedrorum* Vieillot]

[Cedar Waxwing]

[RECORDS.—Cayo Juan García (Varona and Garrido, 1970, specimen).]

Family VIREONIDAE

[*Vireo gundlachii* Lembeyle]

[Cuban Vireo]

[RECORDS.—//Cayo Cantiles (Garrido and Schwartz, 1969, specimens)/Cayo Real (Garrido, 1973b, specimens).

REMARKS.—*Vireo gundlachii*, endemic to the Cuban region, is found in thickets and woodlands throughout its range. Garrido and García (1975) recognized four subspecies as follows: *V. g. orientalis* Todd in southeastern Cuba (Cabo Cruz to Punta Maisí in the area of the former province of Oriente) and on islands off the north-central coast including Cayo Coco, and some of the Cayos de Sabana-Camagüey; *V. g. gundlachii* on mainland Cuba outside the range of *V. g. orientalis*, as well as on the Isle of Pines and some of the Cayos de Sabana-Camagüey; *V. g. magnus* Garrido (1971a) on Cayo Cantiles; *V. g. sanfelipensis* Garrido (1973b) on Cayo Real. Garrido (1973a) included Cayo Francés and cayos Santa María, Las Brujas, and Guillermo all in the range of *V. g. orientalis*, but Garrido and García (1975) later suggested that populations on Santa María and Guillermo in the Cayos de Sabana-Camagüey are indistinguishable from *V. g. orientalis*, whereas those on Francés and Conuco, also in the Sabana-Camagüey group, resemble the nominate form.

The eastern subspecies is supposedly distinguished from the nominate form in having a grayer (less green) dorsum, paler yellow color on the head and venter, and darker and more buffy sides (Todd, 1916). There has been much difference of opinion over the validity of these races, with some authors considering them to be separable (Todd, 1916; Wetmore, 1932; Garrido and García, 1975), and others not (Barbour 1923; Bond, 1956; Blake, 1968).

With regard to the populations from the southern cays, that

from Cayo Cantiles (*V. g. magnus*) is supposed to be distinguished by its greater size, especially wing length (Garrido, 1971a), whereas specimens from the Cayos de San Felipe (*V. g. sanfelipensis*) have been characterized by paler ventral coloration, with more white and less yellow on the chin and throat than in other populations (Garrido, 1973b). We have not examined material of either of these forms. The measurements and degree of isolation of *V. g. magnus* suggest that this is most likely a valid form, whereas the slight (average?) differences in color ascribed to *V. g. sanfelipensis* do not seem convincingly distinct. It is interesting that this species does not occur in the Canarreos except on Cayo Cantiles, a distribution possibly attributable to differences in habitat among the islands.]

Vireo altiloquus (Vieillot)

Black-whiskered Vireo

RECORDS.—Cayos de Sevilla (1M)/Cayo Largo (Bond, 1950; Garrido and Schwartz, 1969), Cayo Arenoso, Cayo Cantiles (Garrido and Schwartz, 1969, specimen)/.

REMARKS.—All specimens are referable to *V. a. barbatulus* (Cabanis), which breeds in southern Florida, the Bahamas, Cuba, the Isle of Pines, and the Cayman Islands, and overwinters in South America. Bond (1950) saw only one on Cayo Largo (3 April), and, as it was not in song, suggested that it may have been a transient. Garrido visited Cayo Largo and Cayo Cantiles several times in spring and summer and found this species common and widespread on both islands (Garrido and Schwartz, 1969). The only visits to the Cayos de San Felipe were during the wintering season, which presumably accounts for the lack of records there, and inadequate sampling in summer on the Jardines de la Reina may in part also account for the species being unrecorded there as well.

Family PARULIDAE

Mniotilta varia (Linnaeus)

Black-and-white Warbler

RECORDS.—/Cabeza del Este, Cayo Rosalía (1M), cay east of Anclitas/Cayo Largo, (Bond, 1950), Cayo Cantiles (Garrido and Schwartz, 1969)/Cayo Real (Garrido, 1973b), Cayo Juan García (Varona and Garrido, 1970).

[*Limnothlypis swainsonii* (Audubon)]

[Swainson's Warbler]

[RECORDS.—Cayo Real (Garrido, 1973b, specimens).

REMARKS.—Garrido and García (1975) assigned specimens from Cayo Real to the subspecies *L. s. alta* Meanley and Gorman, supposedly the first Antillean records for this form, although many authorities consider the species to be monotypic.]

[*Helmitheros vermivorus* (Gmelin)]

[Worm-eating Warbler]

[RECORDS.—Cayo Real (Garrido, 1973b).]

[*Parula americana* (Linnaeus)]

[Northern Parula]

[RECORDS.—Cayo Real (Garrido, 1973b), Cayo Juan García (Varona and Garrido, 1970).]

***Dendroica petechia* (Linnaeus)**

Yellow Warbler

RECORDS.—Vicinity of Cayos Balandras (= Cayo Palmetto in Bartsch's journal and Cayo Palomita in USNM catalog, 2M, 1F), Cayo Perla (2M), Cayos de Sevilla (4M, 4F), Cayo Rabihorcado (1F), Cayo Loma (1F), Cayo Blanco (3M, 1F), Cayo Playa Blanca (2M, 3F)/Cabeza del Este (4M, 3F, 6 September, 2M, 1F, 7 September), Cayo Rosalía, Cayo Contra Punta, cay at 78°33'W (1M), Boca Juan Grín, Cayo Cachiboca, cay east of Anclitas, Cayo Anclitas, Cayo Grande/Cayo Largo and nearby cays ("most abundant land bird" Bond, 1950:50), Cayo Majá (Varona, 1970), Cayo Arenoso (2M, 1F, 1 unsexed), Cayo del Rosario (Bartsch, journal; 2M, 3F, Burleigh and Duvall), Cayo Cantiles (Garrido and Schwartz, 1969, specimen[s]), Cayo Campos (Estrada and Rodríguez, 1985), cays between Cayo Matías and Nueva Gerona (10M, 5F, 23 September—catalogued as from the Isle of Pines, but see locality 27 in "Itinerary")/ Cayo Real (Garrido, 1973), Cayo Juan García (Varona and Garrido, 1970).

REMARKS.—The Yellow Warbler is one of the most common land birds on these islands, though it seldom occurs outside of mangrove associations. All specimens have been referred to *D. p. gundlachi* Baird.

[*Dendroica magnolia* (Wilson)]

[Magnolia Warbler]

[RECORDS.—Cayo Cantiles (Garrido and Schwartz, 1969).]

[*Dendroica virens* (Gmelin)]

[Black-throated Green Warbler]

[RECORDS.—// /Cayo Largo (Garrido and Schwartz, 1969, specimen), Cayo Campos (Estrada and Rodríguez, 1985)/ /.]

***Dendroica dominica* (Linnaeus)**

Yellow-throated Warbler

RECORDS.—Cayo Perla (1M), Cayo Blanco (1M, 1F), Cayo Playa Blanca (1M)/Cabeza del Este (1M, 6 September), Cayo

Rosalía/Cayo Arenoso (1M), cays between Cayo Matías and Nueva Gerona (1M)/ /.

REMARKS.—All specimens are referable to *D. d. dominica*.**[*Dendroica breviunguis* (Spix)
= *Dendroica striata* (Forster) auctorum]**

[Blackpoll Warbler]

[RECORDS.—/ / /Cayo Largo (Garrido and Schwartz, 1969 [specimen, Garrido, in litt., 4 November 1987]), Cayo Cantiles (Garrido and Schwartz, 1969)/ /.]

***Dendroica discolor* (Vieillot)**

Prairie Warbler

RECORDS.—Cayo Perla (3M), Cayos de Sevilla (2M), Cayo Rabihorcado (1M), Cayo Blanco (2F)/Cabeza del Este (1M, 1F, 6 September; 1M, 7 September), Cayo Rosalía, cay at 78°33'W, Boca Juan Grín (1F—label reads "Cay East Boca San Juan Grín"), Cayo Cachiboca, cay west of Cachiboca, Cayo Anclitas, Cayo Grande/Cayo Largo (Bond, 1950), Cayo de la Piedra (Bond, 1950), Cayo Arenoso (1M), Cayo del Rosario, Cayo Cantiles (Bartsch, journal; Burleigh and Duvall, specimen lost; Garrido and Schwartz, 1969, specimen), Cayo Avalos (1M), Rum Cay, cay west of Avalos, Cayo Matías, cays between Cayo Matías and Nueva Gerona (1M)/Cayo Real (Garrido, 1973b), Cayo Juan García (Varona and Garrido, 1970).

[*Dendroica palmarum* (Gmelin)]

[Palm Warbler]

[RECORDS.—/ / /Cayo Largo (Bond, 1950), Cayo Majá (Varona, 1970), Cayo Cantiles (Burleigh and Duvall, specimen lost; Garrido and Schwartz, 1969)/Cayo Real (Garrido, 1973b), Cayo Juan García (Varona and Garrido, 1970).]

[*Seiurus aurocapillus* (Linnaeus)]

[Ovenbird]

[RECORDS.—/ / /Cayo Cantiles (1F, Burleigh and Duvall)/ Cayo Real (Garrido, 1973b), Cayo Juan García (Garrido, 1973b).]

***Seiurus noveboracensis* (Gmelin)**

Northern Waterthrush

RECORDS.—Vicinity of Cayos Balandras (= Cayo Palmetto in Bartsch's journal), Cayo Perla (2F), Cayos de Sevilla (1M), Cayo Rabihorcado (1M), Cayo Blanco (1M), Cayo Playa Blanca (1F)/Cabeza del Este (1F, 6 September), cay west of Cachiboca, Cayo Anclitas/Cayo Largo (Bond, 1950; Garrido and Schwartz, 1969), Cayo Majá (Varona, 1970), Cayo del Rosario (1M, Burleigh and Duvall), Cayo Cantiles (1M, Bartsch; 1M, Burleigh and Duvall; Garrido and Schwartz, 1969, specimen), Rum Cay, Cayo Campos (Estrada and

Rodríguez, 1985), cays between Cayo Matías and Nueva Gerona/Cayo Juan García (Garrido, 1973b).

REMARKS.—The specimens from Sevilla, Cabeza del Este, and Cantiles, are cataloged under *S. n. notabilis* Ridgway, whereas those from Rabihorcado and Blanco cays are under *S. n. noveboracensis*. Eaton (1957) suggests the species is monotypic. Bartsch (journal) attributed several records, unsubstantiated by specimens, to the Louisiana Waterthrush (*Seiurus motacilla* [Vieillot]): Cayo Rosalía, Cayo Contra Punta, Boca Juan Grín, Cayo Cantiles, Cayo Avalos.

Geothlypis trichas (Linnaeus)

Common Yellowthroat

RECORDS.—Cayos de Sevilla (2F, 4 September; 1F, “5 September”—see “Remarks” below), Cayo Rabihorcado, Cayo Loma (1F), Cayo Blanco/cay west of Cachiboca (1M)/Cayo Largo (Garrido and Schwartz, 1969), Cayo Majá (Varona, 1970), Cayo Cantiles (1M, Burleigh and Duvall; Garrido and Schwartz, 1969), Rum Cay (1M)/Cayo Real (Garrido, 1973b, specimen), Cayo Juan García (Varona and Garrido, 1970).

REMARKS.—The catalog and original field label indicate that USNM 323998 was taken on “Savilla Cay” on 5 September, although the journal indicates that the expedition had reached Cayo Rabihorcado on the evening of 4 September and proceeded westward from there.

Subspecific limits in this species have been the subject of greatly varying interpretation. Most of the present specimens were cataloged under the name *G. t. brachydactyla* (Swainson), which Parkes (1954) includes in *G. t. trichas*. That from Cayo Loma was annotated by H. C. Oberholser as belonging to his race “*quebecicola*” and is now placed among specimens of *G. t. pelagitis* Braund and McCullagh (both subspecies regarded as synonyms of *G. t. trichas* by Lowery and Monroe, 1968), whereas the specimen from the cay east of Cachiboca is included with the form *G. t. typhicola* Burleigh.

Teretistris fernandinae (Lembeye)

Yellow-headed Warbler

RECORDS.—Cayo Cantiles (2M, 2F, 21 September; Garrido and Schwartz, 1969, specimens).

REMARKS.—*Teretistris fernandinae*, endemic to the Cuban region, is found in western Cuba eastward to Matanzas Province, at least to the Zapata Peninsula in the south (Garrido and García, 1975) and to Rincón Francés, Punta de Hicacos in the north (Bond, 1966). Garrido (in litt., 4 November 1987) says it is now known to occur as far east as Itabo, near El Marquéz, and no more than 5 km from the western limit of the range of *T. fornsi*. All other verified records of this species are from the Isle of Pines and Cayo Cantiles. Bond (1956) suggested that *T. fernandinae* may be conspecific with *T. fornsi* Gundlach, the latter occurring in eastern Cuba as far west as Playa de la Tēja Itabo, Matanzas Province (Bond, 1963).

The specimens of *T. fernandinae* from Cayo Cantiles are the

only examples of the species from the “Bartsch collection” in the catalog and do not differ from typical examples; two *T. fornsi* (one from Guantánamo Bay, 14 August, and another from Puerto Portillo, 29 August) are the only Bartsch examples of that species. In the journal, Bartsch reports one “Ferdinandez Warbler” seen at Río Ojo del Toro on 29 or 30 August, and a “Ferdinand’s Warbler” seen at Puerto Portillo, 29 August—both locations far to the east of the known range of *T. fernandinae*. Bartsch’s sight records of *Teretistris* from the cays include a “Cuban Warbler” (a name used by Bartsch presumably for *T. fornsi* and included in his journal lists of birds seen at Guantánamo Bay) at Cayo Blanco, 6 September, a “Ferdinandini’s Warbler” at Cabeza del Este, 6 September, and a “Ferdinandi’s Warbler” at Cayo Rosalía, 7 September. All of these sight records are probably best regarded as questionable, as there have been no other reports of *Teretistris* from any of the southern cays except Cantiles.

Setophaga ruticilla (Linnaeus)

American Redstart

RECORDS.—/Cabeza del Este (1M, 6 September), cay west of Cachiboca (1M)/Cayo Largo (Bond, 1950; Garrido, 1973b); Cayo Majá (Varona, 1970), Cayo Cantiles (Garrido and Schwartz, 1969, included in species list [p. 40] but not in species accounts)/Cayo Real (Garrido, 1973b), Cayo Juan García (Varona and Garrido, 1970).

Subfamily THRAUPINAE

[*Spindalis zena* (Linnaeus)]

[Stripe-headed Tanager]

[RECORDS.—//Cayo Cantiles (Garrido and Schwartz, 1969, specimens)/Cayo Real (Garrido, 1973b, specimens).

REMARKS.—All specimens are referable to the endemic Cuban subspecies *S. z. pretrei* (Lesson). This species inhabits woodlands on Cayo Cantiles and Cayo Real, and also occurs in secondary vegetation near the coast, at least on Cantiles (Garrido and Schwartz, 1969; Garrido, 1973b). According to Garrido and Schwartz (1969), the specimens from Cantiles average slightly larger in both sexes, at least in wing length, than in birds from Cuba and the Isle of Pines. No differences in coloration were noted between females, but the pale band on the dorsum is said to be less extensive in the males from Cantiles. The two specimens from Cayo Real were found to be similar to mainland birds (Garrido, 1973b).]

Family ICTERIDAE

Quiscalus niger (Boddaert)

Greater Antillean Grackle

RECORDS.—Cayo Loma (1M)/Cabeza del Este (2F, 6 and 7 September), Cayo Rosalía (1M), cay at 78°33'W, Cayo Cachiboca (1M), Cayo Anclitas/Cayo Largo (Bond, 1950,

TABLE 4.—Measurements (mm) of *Quiscalus niger* from mainland Cuba and islands off the southern coast. (Sequence is mean \pm standard deviation, (N), range.)

Locality	Sex	Wing length		Tail length		Bill length		Tarsus length	
Cuba (central and eastern ¹)	M	150.0 \pm 3.9	(29) 144–157	124.9 \pm 4.4	(28) 118.2–133.8	33.6 \pm 1.31	(29) 31.3–35.8	37.8 \pm 1.12	(29) 35.3–40.4
Cuba (western ²)	M	145.3 \pm 4.3	(15) 138–151	121.0 \pm 5.0	(13) 113.6–128.1	32.0 \pm 1.16	(16) 29.7–34.5	36.9 \pm 0.94	(16) 35.4–38.5
Cuba (western ²)	M	142.5 \pm 1.2	(6) 141–144	117.1 \pm 4.7	(7) 112.8–124.1	31.9 \pm 1.75	(7) 30.4–35.2	37.0 \pm 0.73	(7) 35.8–38.1
Isle of Pines	M	140.8 \pm 2.4	(15) 137–144	116.5 \pm 6.3	(12) 104.0–124.2	32.0 \pm 0.99	(15) 30.4–33.4	36.8 \pm 0.95	(15) 35.6–38.7
Los Canarreos	M	133.3 \pm 3.8	(3) 129–136	113.8	(2) 110.5–117.0	31.9 \pm 2.01	(5) 29.5–34.3	36.0 \pm 1.54	(5) 33.8–37.8
Jardines de la Reina	M	140	(1)	—	—	28.5	(2) 27.2–29.8	34.8	(2) 32.9–36.7
Cayo Loma	M	148	(1)	—	—	31.6	(1)	34.2	(1)
Cuba (central and eastern ¹)	F	131.4 \pm 3.8	(9) 125–136	107.9 \pm 4.7	(9) 102.8–115.6	28.1 \pm 1.31	(8) 26.1–29.7	33.9 \pm 1.03	(9) 32.5–35.6
Cuba (western ²)	F	126.5 \pm 2.3	(8) 124–130	101.6 \pm 4.2	(8) 96.1–108.1	27.9 \pm 0.93	(8) 26.5–29.3	33.0 \pm 1.19	(9) 31.5–35.0
Cuba (western ²)	F	124.5 \pm 2.4	(4) 123–130	100.7 \pm 8.0	(4) 90.7–110.2	27.5 \pm 0.97	(4) 26.5–28.8	32.9 \pm 0.32	(4) 32.5–33.2
Isle of Pines	F	121.4 \pm 4.5	(5) 115–126	98.7 \pm 0.9	(3) 97.8–99.5	27.1 \pm 0.33	(5) 26.8–27.6	32.8 \pm 0.57	(5) 32.1–33.4
Los Canarreos	F	129	(1)	—	—	28.8	(2) 26.4–31.2	34.6	(2) 33.0–36.2
Jardines de la Reina	F	124	(1)	—	—	27.6	(2) 26.7–28.4	32.5	(2) 31.8–33.2

¹Villa Clara, Sancti Spiritus, Camagüey, Granma, Holguín, Santiago de Cuba, and Guantánamo provinces.

²La Habana, Matanzas, and Cienfuegos provinces.

³Pinar del Río Province.

specimens; Garrido and Schwartz, 1969, specimen[s]), Cayo Majá (Garrido and Schwartz, 1969), Cayeria los Majaes including Cayo de la Piedra (Bond, 1950, specimen), East Majaes Cay (Bond, 1950, specimen), Cayo Estopa (Garrido and Schwartz, 1969, specimen[s]), Cayo Arenoso (1M, 1F), Cayo del Rosario (1M, 20 September—see below; 1M, Burleigh and Duvall), Cayo Cantiles (2M, 1M?, 21 September; 1M, 1F, Burleigh and Duvall; Garrido and Schwartz, 1969, specimen[s]), Cayo Campos (Estrada and Rodríguez, 1985 [listed as *Q. n. caribaeus* (Todd)]), Cayo Matías (1F)/Cayo Real (Garrido, 1973b, specimens), Cayo Juan García (Varona and Garrido, 1970, specimen).

SPECIMENS EXAMINED: CUBA (by province): Pinar del Río MCZ (1F), USNM (7M, 3F); La Habana, MCZ (6M, 4F), USNM (4M, 2F), YPM (1F); Matanzas, MCZ (1M), USNM (1M, 1F), YPM (1M); Cienfuegos, USNM (1M), YPM (1M); Villa Clara, MCZ (2M, 1F), USNM (1M, 1F); Sancti Spiritus USNM (1M), YPM (2M); Camagüey, MCZ (1M); Granma USNM (2M); Holguín, MCZ (7M, 4F), USNM (2M); Santiago de Cuba, USNM (2M, 1F); Guantánamo, USNM (10M, 2F). ISLE OF PINES: MCZ (5M, 1F), USNM (5M), YPM (5M, 4F). ARCHIPIÉLAGO DE LOS CANARREOS: Sandy Cay = Cayo Arenoso, USNM (1M, 1F); Cayo del Rosario, USNM (2M); Cayo Cantiles, USNM (4M); Cayo Matías, USNM (1F). ARCHIPIÉLAGO DE LOS JARDINES DE LA REINA: Cabeza del Este, USNM (2F); Cayo Rosalía, USNM (1M); Cayo Cachiboca, USNM (1M). GOLFO DE GUACANAYABO: Cayo Loma, USNM (1M).

REMARKS.—USNM 324007 is labeled and catalogued as being taken on Cayo Rosalía, but as it was collected on 20 September, the island probably is Cayo del Rosario. Bond (1950) reported this species as common in mangrove swamps

and in the arid, palm-covered interior of Cayo Largo (and on some of the adjacent cays). Varona and Garrido (1970) stated that it was the most abundant bird on Cayo Juan García, where it showed little fear of man and often was seen feeding on kitchen scraps. The Burleigh and Duvall specimen from Cayo Cantiles was noted as having the testes very small on 22 March.

Summarizing largely from Garrido (1973b), there are two subspecies in the Cuban region: *Q. n. gundlachii* Cassin, relatively large (wing length 141–157 mm in males, 121–134 mm in females), with a purplish sheen in males; *Q. n. caribaeus* (Todd), relatively small (wing length 131–145 mm in males, 114–124 mm in females), with a bluish sheen in males. Garrido (1973b) studied more than 100 specimens taken throughout Cuba, confirming and augmenting Bond's (1950, 1956) interpretation of the distribution of the two subspecies. *Q. n. gundlachii* occurs throughout most of mainland Cuba, extending west into Pinar del Río Province. *Q. n. caribaeus* occurs throughout the southern cayerias, from the Jardines de la Reina through the Isle of Pines and the Cayos de San Felipe. It is also found in the northern cayeria of Sabana-Camagüey, and in western Pinar del Río, intergrading with *Q. n. gundlachii* in parts of westernmost Cuba including the southern coast of Pinar del Río province, and northern coast of Habana and Matanzas provinces. Bond (1950) found the birds he collected in Los Canarreos to be smaller than usual for *caribaeus* (confirmed by Garrido, 1973b) and considered the Bartsch specimen from Cayo Loma in the Golfo de Guacanaybo to be an intergrade (Bond, 1956).

Our examination of the specimens in the Smithsonian collections, including all those from the Bartsch expedition, support all of the above observations (Table 4). We would interpret this very interesting pattern of distribution in the

TABLE 5.—Measurements (mm) of *Agelaius humeralis*. (Sequence is mean \pm standard deviation, (N), range.)

Locality	Sex	Wing length		Tail length		Bill length		Bill depth	
Cuba (western ¹)	M	103.4 \pm 2.2	(18) 100–108	76.2 \pm 3.8	(18) 72.0–83.7	16.6 \pm 0.47	(17) 15.9–17.4	6.9 \pm 0.33	(13) 6.4–7.6
Cuba (central ²)	M	104.1 \pm 2.9	(9) 98–109	76.8 \pm 3.8	(8) 71.6–82.5	17.1 \pm 0.59	(9) 16.2–17.8	7.1 \pm 0.24	(8) 6.9–7.6
Cuba (eastern ³)	M	103.3 \pm 2.5	(12) 98–108	77.2 \pm 3.0	(12) 72.1–82.2	16.7 \pm 0.54	(12) 15.3–17.3	7.4 \pm 0.35	(12) 6.9–8.0
Haiti	M	103	(1) –	79.2	(1) –	16.7	(1) –	7.5	(1) –
Jardines de la Reina	M	96.4 \pm 4.8	(8) 90–102	69.9	(2) 68.5–71.4	15.3 \pm 0.61	(8) 14.4–16.0	6.6 \pm 0.30	(8) 6.2–7.0
Cayo Cantiles (<i>A. h. scopulus</i>)	M	91.0 \pm 3.6	(3) 88–95	67.7 \pm 2.3	(3) 65.4–70.0	16.0 \pm 0.72	(3) 15.2–16.6	6.2 \pm 0.31	(3) 5.9–6.5
Cuba (western ¹)	F	94.7 \pm 2.5	(23) 90–99	69.9 \pm 2.7	(22) 65.3–74.1	15.3 \pm 0.63	(21) 13.9–16.5	6.5 \pm 0.19	(15) 6.2–6.9
Cuba (central ²)	F	96.4 \pm 4.0	(7) 92–102	70.2 \pm 2.7	(7) 67.3–73.4	15.9 \pm 0.25	(7) 15.5–16.2	6.8 \pm 0.35	(7) 6.4–7.4
Cuba (eastern ³)	F	94.8 \pm 2.2	(4) 92–96	71.2 \pm 3.9	(4) 66.5–75.9	15.6 \pm 0.34	(4) 15.3–16.1	7.0 \pm 0.16	(4) 6.8–7.2
Haiti	F	95.5	(2) 94–97	73.1	(2) 72.1–74.2	15.4	(2) 15.3–15.5	–	–
Jardines de la Reina	F	90.3 \pm 3.6	(6) 87–97	60.2	(1) –	14.1 \pm 0.49	(5) 13.6–14.9	6.1 \pm 0.19	(5) 5.8–6.3
Cayo Cantiles (<i>A. h. scopulus</i>)	F	85.0	(2) 84–86	65.6	(1) –	15.0	(2) 14.2–15.7	6.0	(2) 5.8–6.2

¹Pinar del Río and La Habana Provinces.

²Matanzas, Villa Clara, Sancti Spiritus, and Camagüey provinces.

³Holguín, Santiago de Cuba, and Guantánamo Provinces.

following way. *Q. n. caribaeus* was probably originally distributed uniformly throughout most of the Cuban region including all of the cayerias, which may have been connected to the mainland at the time. *Q. n. gundlachii* then diverged somewhere in eastern Cuba and began spreading westward after rising sea levels had isolated the Isle of Pines and the northern and southern cayerias. As it spread it swamped out and replaced *Q. n. caribaeus*, and has progressed almost to the western end of the mainland, leaving the various populations of *Q. n. caribaeus* as isolated relicts on islands and at the western end of the mainland.

Dives atrovioleaceus (d'Orbigny)

Cuban Blackbird

RECORDS.—Cayo Loma.

REMARKS.—Bartsch mentioned seeing both "Wedge-tail Grackle" and "Cuban Grackle" on Cayo Loma, apparently referring to *Quiscalis niger* and *Dives atrovioleaceus*, respectively, as the latter is also called Cuban Grackle by Barbour (1923). This record requires verification, however, as *Dives*, although widespread on the mainland, has not been recorded from any of the smaller islands and is of doubtful occurrence on the Isle of Pines.

Agelaius humeralis (Vigors)

Tawny-shouldered Blackbird

RECORDS.—/Cayo Rosalía (7M, 5F "very abundant"), cay at 78°33'W (1M, 1F)/Cayo Cantiles (2M, 2F, 20 September; 4M, 22 March, Burleigh and Duvall, of which three are now in the collections of the University of Havana [Garrido, 1970]; Garrido and Schwartz, 1969, specimens; 3M, 12 April and 1 May, Garrido, 1970)/.

SPECIMENS EXAMINED.—CUBA (by province): Pinar del Río MCZ (1M), USNM (7M, 7F); La Habana, MCZ (1F), USNM (7M, 8F), YPM (3M, 7F); Matanzas, MCZ (1M, 1F), USNM (2M); Villa Clara, MCZ (3M, 3F); Sancti Spiritus, USNM (1F), YPM (2M, 2F); Camagüey, USNM (1M); Holguín, MCZ (2M); Santiago de Cuba, MCZ (1M, 1F); Guantánamo, MCZ (1M), USNM (8M, 3F). ARCHIPIÉLAGO DE LOS CANARREOS: Cayo Cantiles, USNM (3M, 2F). ARCHIPIÉLAGO DE LOS JARDINES DE LA REINA: Cayo Rosalía, USNM (7M, 5F); cay at 78°33'W, USNM (1M, 1F). HISPANIOLA: Haiti, USNM (1M, 2F).

REMARKS.—This blackbird is widespread in Cuba, occurring in edge habitats and in open areas (Garrido and García, 1975), including yards and gardens (Barbour, 1923). Except for an outlying population in northern and west-central Haiti, it is confined to the Cuban region. It was considered to be monotypic until the population on Cayo Cantiles was described as an endemic subspecies, *A. h. scopulus* Garrido (1970), distinguished from the nominate form by its smaller size and more slender bill. Our measurements (Table 5) confirm the distinctiveness of the birds from Cayo Cantiles, as there is virtually no overlap between them and mainland birds in wing length, tail length, or bill depth. It is also evident that birds from the Jardines de la Reina are also smaller on average than mainland birds although with more overlap. This is another apparent example of parallel reduction in size in the two archipelagos, similar to that in *Xiphidopicus*. The population on Cayo Cantiles is curiously isolated, as the species does not occur elsewhere in Los Canarreos or even on the Isle of Pines. Its lack of overlap with the nominate form entitles *A. h. scopulus* to be recognized as a valid subspecies, whereas the populations from the Jardines de la Reina show too much overlap to merit naming.

[*Dolichonyx oryzivorus* (Linnaeus)]

[Bobolink]

[RECORDS.—// /Cayo Largo (Garrido and Schwartz, 1969), Cayo Cantiles (Garrido and Schwartz, 1969), Cayo Campos (Estrada and Rodríguez, 1985)/ /.]

Family FRINGILLIDAE**[*Passerina cyanella* (Sparrman)]**

[Indigo Bunting]

[RECORDS.—// /Cayo Cantiles (Garrido and Schwartz, 1969), Cayo Campos (Estrada and Rodríguez, 1985)/ /.]

REMARKS.—Use of the specific name *cyanella* follows Olson (in Wetmore et al., 1984:553).

***Tiaris olivacea* (Linnaeus)**

Yellow-faced Grassquit

RECORDS.—// /Jardines de La Reina (Garrido, 1978b)/Cayo Largo (Bond, 1950), Cayería los Majaes including East Majaes Cay (Bond, 1950) and Cayo Majá (Varona, 1970), Cayo Cantiles (1F, 21 September; Garrido and Schwartz, 1969), Cayo Avalos (1F), Cayo Campos (Estrada and Rodríguez, 1985)/ /.

REMARKS.—Specimens are referable to *T. o. olivacea*. Unidentified grassquits, presumably this species, were recorded in Bartsch's journal from Boca Juan Grin, Cayo Cachiboca, and Cayo Anclitas. Bond (1950) mentions encountering the species in small flocks and finding old, disused nests in dense scrub of Largo and East Majaes cays, and Garrido and Schwartz (1969) considered it fairly common in grassy and shrubby areas on Cantiles.

***Melopyrrha nigra* (Linnaeus)**

Cuban Bullfinch

RECORDS.—// /Cayo Arenoso (1M), ?Cayo del Rosario (Bartsch's journal mentions "Black Finch" here and this may be the source of Bond's [1956] listing it from this island, so the occurrence needs confirmation), Cayo Cantiles (5M, 21 September; Garrido and Schwartz, 1969, specimens)/ /.

REMARKS.—These specimens do not seem to differ from *M. n. nigra* of mainland Cuba but Garrido and Schwartz (1969) reported 6 males and 4 females from Cantiles to average slightly larger in wing length than those from Cuba and the Isle of Pines (~3.0 mm larger in males). They detected no differences in coloration between males, but found females from Cantiles slightly darker than those of Cuba and Isle of Pines. Bond (1950) mentions specifically looking for this species on Cayo Largo, without success. He mentions that it is found on Cayo del Rosario, as do Garrido and Schwartz

(1969), though none of these authors mention specific records; possibly Bond was referring to Bartsch's mention, as he had access to Bartsch's journal.

[*Passerculus sandwichensis* (Gmelin)]

[Savannah Sparrow]

[RECORDS.—Cayo Juan García (Garrido, 1973b).]

Discussion

Biogeographic patterns within the Cuban region (Cuba, the Isle of Pines, and cayerías) have been shaped in large measure by episodic, eustatic changes in sea-level during the Pleistocene. Highlands remained emergent during sea-level maxima, at which times certain populations differentiated in isolation on widespread refugia, whence re-emergent land was subsequently recolonized. Low-lying islands of the Cuban cayerías almost certainly were submerged completely during the early interglacials and have thus received their present biota only since the mid- to late Pleistocene. The extent to which birds of these outliers arrived over water or are relicts of populations once uniformly distributed over formerly continuous land is unknown.

Cayo Largo, one of the largest of the southern cays, is about 15 m high (United States Hydrographic Office, 1927); much of the western part of Cayo Anclitas is only about 2 m above sea-level (Armas, 1976). Elevations for other islands are not available but they probably fall generally within this range or are not much higher. Seas separating the southern cays from mainland Cuba range in depth generally from 4–6 m (maximum ~12 m) in the Golfo de Batabanó (north of Cayos de San Felipe, Isle of Pines, and the Archipiélago de los Canarreos) to about 7–22 m (maximum ~28 m) in the Golfo de Ana María (north of the Jardines de la Reina) and in the Golfo de Guacanayabo.

The extent to which these low-lying cayerías were emergent during the last (Sangamon) interglacial high sea-level stand (~6+ m relative to present sea level, fide Bloom, 1983, and Harmon et al., 1983) is unknown, but doubtless many of the smaller islands were completely submerged, and much less land was exposed then on even the largest and highest islands. On the other hand, the cays were broadly connected to Cuba and the Isle of Pines over much or all of the Wisconsinan glacial stage that followed, when sea level oscillated from about 10–15 m below present level (Johnson, 1983, fig. 5) to a maximum of 100–130 m below present level (Marcus and Newman, 1983; Occhietti, 1983) approximately 18,000 years ago. Judging from various estimates of eustatic change during the Holocene transgression, broad land connections between Cuba, the Isle of Pines and the cayerías probably persisted at least as recently as 8,000 years ago. Marcus and Newman

(1983) estimated previous levels of the west Florida shelf at 13,000, 10,000, 7500, and 5000 years ago as -35, -20, -15, and -4 to -5 m, respectively, relative to present sea level. During even the lowest stadial of the Pleistocene, however, there were no direct land connections between Los Canarreos and the Jardines de la Reina across the Golfo de Cazonos, where depths range from several hundred meters (near the coast) to over 3000 m.

Diminution and fragmentation of land, as well as the attendant changes in climate and vegetation at the end of the Pleistocene, resulted in many extinctions on Caribbean islands (Pregill and Olson, 1981; Olson and Hilgartner, 1982). Such extinctions doubtless took place on the Cuban cayerias following their last separation from Cuba, although fossils are unknown from these cays. The vulnerability of populations on small, low-lying islands to storms and other environmental hazards probably has also resulted in many local extirpations, with the islands being subsequently repopulated by recruits from adjacent cays, the Isle of Pines, or mainland Cuba.

Although the southern cayerias are far from well-known ornithologically, probably few species will be added to the list of 28 land birds (Columbiformes through Passeriformes) breeding, or probably breeding there (Table 6). Further field studies almost certainly would add many new locality and breeding records and shed additional light on patterns of distribution and levels of differentiation. At least 23 of the 28 species recorded thus far among these islands are widespread elsewhere in the Antilles or in the Bahamas, occurring on at least three islands outside the Cuban region and in most cases many more. Of the five others, *Melopyrrha nigra* is found also on Grand Cayman (*M. n. taylori*), and *Agelaius h. humeralis* has a toehold in northern and west-central Haiti, whereas *Xiphidiopicus percussus*, *Vireo gundlachii*, and *Teretistris fernandinae* are Cuban endemics, though fairly common in suitable habitat throughout their range on mainland Cuba.

A rigorous analysis of each of the four island groups individually is not practical at this time, but the imperfect data now available at least permit some preliminary comparison between these areas. The cays in the Golfo de Guacanayabo are smaller and more widely scattered than those in the three other groups. They are also among the least known of the Cuban islands, with data for at least 7 of the islands or groups of islands stemming solely from the perfunctory collections and observations of the Bartsch expedition. These islands appear to be largely covered with mangroves, so that lack of habitat diversity, coupled with small island areas, doubtless limits the diversity of resident birds. Of the 28 species of land birds reported from the southern cays, only 9 have been recorded in the Guacanayabo region (the putative sight record of *Dives atrovioleaceus* is omitted): *Columba leucocephala*, *Zenaid macroura*, *Z. aurita*, *Columbina passerina*, *Tyrannus dominicensis*, *T. caudifasciatus*, *Vireo altiloquus*, *Dendroica*

TABLE 6.—The resident land birds (Columbiformes through Passeriformes) of the cays off the southern coast of Cuba. (GdG = cays in the Golfo de Guacanayabo, JdR = Archipiélago de los Jardines de la Reina, L = Cayo Largo (Archipiélago de los Canarreos), C = Cayo Cantiles (Archipiélago de los Canarreos), CdS = Cayos de San Felipe. X = present, dash = absent.)

Scientific name	GdG	JdR	L	C	CdS
<i>Columba leucocephala</i>	X	X	X	X	X
<i>Columba inornata</i>	-	-	-	-	X
<i>Zenaid macroura</i>	X	X	-	-	-
<i>Zenaid aurita</i>	X	-	X	X	X
<i>Zenaid asiatica</i>	-	-	X	X	-
<i>Columbina passerina</i>	X	-	X	X	X
<i>Geotrygon chrysis</i>	-	-	-	X	-
<i>Coccyzus minor</i>	-	-	X	X	-
<i>Crotophaga ani</i>	-	-	X	X	X
<i>Chordeiles gundlachii</i>	-	-	X	X	X
<i>Chlorostilbon ricordii</i>	-	X	X	X	X
<i>Melanerpes superciliosus</i>	-	-	X	X	X
<i>Xiphidiopicus percussus</i>	-	X	-	X	-
<i>Tyrannus dominicensis</i>	X	X	X	X	-
<i>Tyrannus caudifasciatus</i>	X	X	-	-	-
<i>Myiarchus sagrae</i>	-	X	X	X	X
<i>Contopus caribaeus</i>	-	X	X	X	X
<i>Mimus polyglottos</i>	-	-	X	X	X
<i>Turdus plumbeus</i>	-	X	-	X	-
<i>Vireo gundlachii</i>	-	-	-	X	X
<i>Vireo altiloquus</i>	X	-	X	X	-
<i>Dendroica petechia</i>	X	X	X	X	X
<i>Teretistris fernandinae</i>	-	-	-	X	-
<i>Spindalis zena</i>	-	-	-	X	X
<i>Quiscalus niger</i>	X	X	X	X	X
<i>Agelaius humeralis</i>	-	X	-	X	-
<i>Tiaris olivacea</i>	-	X	X	X	-
<i>Melopyrrha nigra</i>	-	-	-	X	-

petechia, and *Quiscalus niger*. All are widely distributed throughout the Antilles, and, with the exception of *Q. niger*, are also among the more common species on many islands in the Bahamas.

Of the 28 species of land birds in the southern cayerias, 14 occur in the Jardines de la Reina, a list that will probably be considerably augmented with more intensive surveys of the larger islands. Nevertheless, this figure contrasts rather markedly with the 25 species recorded for Los Canarreos.

The remaining southern cayerias (Los Canarreos, Cayos de San Felipe), together with the Isle of Pines, form a broad arc across the southern edge of the Golfo de Batabanó. Their faunas, like those of the other cayerias, probably were derived in part over water and in part over land connections that persisted from Wisconsinan time into the Holocene. The Isle of Pines, much larger and higher than any of the cays, probably has an older and more stable fauna (though it has no endemic species of birds) that would have provided a source of potential

colonists for the outlying cays throughout their history.

The Archipiélago de los Canarreos is the best known ornithologically of all the southern cayerias, although only Cayo Cantiles, Cayo Largo, and some of its immediately adjacent islands have been surveyed reasonably well. Nevertheless, 25 of the 28 land birds known from the southern cays have been recorded in the Canarreos, all 25 being known from Cayo Cantiles. The 3 missing species are *Columba inornata*, *Zenaida macroura*, and *Tyrannus caudifasciatus*, the absence of the last two being most puzzling.

Habitat diversity and extensive woodlands or forests on Cantiles, which are lacking or scarce on the other islands, doubtless account for the relatively large number of species there, sampling biases notwithstanding. Cayo Largo is slightly larger and slightly closer to the Cuban mainland than is Cantiles, and has been visited several times by ornithologists. Yet only 17 of the 28 species have been recorded there in contrast to 25 from Cantiles. The 8 species known from Cantiles that have not been found on Largo are: *Geotrygon chrysis*, *Xiphidiopicus percussus*, *Turdus plumbeus*, *Vireo gundlachi*, *Teretistris fernandini*, *Spindalis zena*, *Agelaius humeralis*, and *Melopyrrha nigra*. At least 5 of these are usually found in densely wooded areas: *Geotrygon*, *Xiphidiopicus*, *Turdus*, *Vireo*, and *Teretistris*. *Spindalis zena* is also typically a woodland bird on Cuba, though it occurs on predominately scrub-covered islands in the southern Bahamas. *Agelaius humeralis*, although occurring in sparsely vegetated areas may prefer habitats more mesic than those on Cayo Largo. The absence of *Melopyrrha nigra* on Cayo Largo, if real, is also possibly habitat related, as this species has been found only on the more densely vegetated islands among those off the northern coast of Cuba (Garrido, 1973a). The fact that Cayo Largo is larger and slightly closer to a mainland source area for potential colonists than Cayo Cantiles, yet has 8 fewer species, illustrates very nicely the perils of simplistic theorizing based solely on more easily quantified variables such as island area and distance from mainland.

The Cayos de San Felipe, like the Canarreos, occupy a geographic position between Cuba and the Isle of Pines, but to the west of the latter. Only two of the islands have been surveyed ornithologically, from which 15 of the 28 land birds known from the southern cayerias have been reported. The three subspecies described from these islands (*Melanerpes superciliaris sanfelipensis*, *Contopus caribaeus sanfelipensis*, *Vireo gundlachi sanfelipensis*), none of which we have examined, appear from their original descriptions to be rather weakly differentiated.

The Isle of Pines has 23 species of resident land birds (excluding a questionable records of *Streptoprocne zonaris*, *Cyanerpes cyaneus*, *Tiaris canora*) that have not been recorded from the southern cayerias (Table 7). The majority of these occur chiefly in montane forest or in dense woodlands at lower

TABLE 7.—Land birds occurring on the Isle of Pines but not in the southern cayerias.

<i>Columba squamosa</i>	<i>Mellisuga helenae*</i>
<i>Geotrygon montana</i>	<i>Priotelus temnurus</i>
<i>Starnoenas cyanocephala</i>	<i>Todus multicolor</i>
<i>Amazona leucocephala</i>	<i>Tyrannus cubensis</i>
<i>Aratinga euops*</i>	<i>Progne cryptoleuca</i>
<i>Saurothera merlini</i>	<i>Hirundo fulva</i>
<i>Tyto alba</i>	<i>Corvus nasicus</i>
<i>Glaucidium siju</i>	<i>Myadestes elizabeth*</i>
<i>Gymnoglaux lawrencii</i>	<i>Icterus dominicensis</i>
<i>Asio stygius</i>	<i>Agelaius phoeniceus</i>
<i>Caprimulgus cubanensis</i>	<i>Sturnella magna</i>
<i>Tachornis phoenicobia</i>	

*Formerly resident but no confirmed records in recent decades (Garrido, in litt., 4 November 1987).

elevations, with others occurring in savanna (*Sturnella magna*) or brackish or freshwater marshes (*Agelaius phoeniceus*)—habitats that are lacking or very limited in the cays. Among these 23, those that might reasonably be expected in the southern cayerias include *Saurothera merlini*, *Tyto alba*, and *Glaucidium siju*. *Amazona leucocephala* and *Corvus nasicus* may also fall into this category. *Poliopitila lembeyi* does not occur in western Cuba nor on the Isle of Pines, but its apparent absence from the Jardines de la Reina is somewhat surprising, as it is fairly common, at least locally, in coastal scrub in southeastern Cuba (Bond, 1956, 1971; Garrido and Garcia, 1975), and it occurs on some of the northern cays including Cayo Coco, (Garrido, 1976) and cayos Guajaba and Sabinal (Garrido, in litt., 4 November 1987).

Differentiation of insular populations in the southern cayerias appears to be due both to in situ evolution and to the persistence of relictual forms once probably found on the mainland. In most instances, in situ evolution has produced parallel similarities in the populations of the two main archipelagos, Los Canarreos and Jardines de la Reina. Examples of this are the forms of *Xiphidiopicus percussus*, *Contopus caribaeus*, and *Agelaius humeralis*. Specimens of *Xiphidiopicus* from Los Canarreos and the Jardines de la Reina are distinctly smaller and less vividly colored than those of the mainland, although the material available to us was not sufficient to say whether these two populations can be distinguished from one another. Specimens of *Agelaius humeralis* from the Jardines de la Reina and from Cayo Cantiles are smaller than those from the mainland, with those from Cantiles being markedly so, with a more slender bill.

In a similar situation, the populations of *Contopus caribaeus* in each archipelago have independently experienced a reduction in the buffy coloration of the plumage. However, because the ancestral mainland populations in the east differ in intensity

of coloration from those in the west, the two insular forms may also be distinguished from one another. In reviewing the lizards of the *Leiocephalus cubensis* complex, Schwartz (1959) remarked on the similarity between *L. c. paraphrus* of the Jardines and *L. c. pambasileus* of the Canarreos, and he postulated an independent origin of each from different populations on the Cuban mainland. These differences must have evolved in parallel because, as outlined above, the two groups of islands were never directly connected to one another.

Other apparent in situ differentiation involves *Melanerpes superciliaris*, with named forms from the Cayos San Felipe and Cayo Largo, and a possibly distinct population on Cayo Avalos

(but the nominate subspecies occurs on Cayo Cantiles), and *Vireo gundlachi*, with a weak, if valid, subspecies in the Cayos San Felipe and a distinct isolate on Cayo Cantiles.

Possible or probable examples of relictual populations include *Turdus plumbeus*, with an enigmatic specimen, possibly of hybrid origin, from Cayo Caballones in the Jardines de la Reina, and *Quiscalus niger*, with the subspecies *Q. n. caribaeus* persisting in the northern and southern cayerias, including the Isle of Pines, and the westernmost mainland of Cuba, having apparently been replaced elsewhere on the mainland by *Q. n. gundlachi*.

Appendix

Publications on Cuban Birds by Pedro Regalado Ruíz

Publications and putative publications by Pedro Regalado containing descriptions of new taxa of Cuban birds have been attributed to some extremely obscure journals that may not be received by any libraries outside of Cuba (at least none that we have been able to locate). Neither these journals, nor reprints of the papers in question, seem to have been disseminated to any extent at all, even within Cuba. It has so far proven impossible to document the actual, or even approximate, dates of publication of most of these. Olson has corresponded occasionally with Regalado but was still unable to obtain original copies of most publications and was completely unsuccessful at securing information concerning dates of publication.

Three of Regalado's names did not receive any published notice until long after two of them were supposedly published in 1977 (see Bond, 1984), and no source of publication has yet come to light for one of these (*Melanerpes superciliosus rosamariae*—see below). As evidence that the publications in which these names appeared are excessively recondite, we note that Garrido et al. (1986) evidently did not have access to any of them for their review of the literature of the vertebrates of the Cuban cays and they could only cite Bond (1984) as having mentioned them! There is a question of priority involved here in the names *Contopus caribaeus nerlyi* Garrido (1978) versus *C. c. florentinoi* Regalado ("1977"). Garrido's publication carries the date April 1978, which is probably correct, as Olson was sent a copy postmarked 15 May 1978. There is considerable room for doubt that 1977 is the actual year of publication of Regalado's name.

At least two of the new subspecies published by Regalado are supposed to have appeared in a journal that Bond (1984) refers to as "*Revista Forestal*." In the only copy of a complete issue of this journal that we have seen that contains a paper by Regalado ("Primer hallazgo de *Speotyto cunicularia* (Molina) anidando en Cuba," pages 36–56, 4 figures, 3 + 1 tables), the cover reads "Cuba—*Revista Forestal/ Baracoa/ Publicación Científico-técnica Año 5 No 1–2*." The inside title page, however, reads "Baracoa/ *Revista Científico-Técnica /Año 5 No.1–2, Ene.-Jul.[January–July] 1975 /Editada por el Instituto Nacional de Desarrollo y Aprovechamiento Forestales./Dirección: Virtudes 680, La Habana, Cuba.*" Therefore, it is uncertain just how this journal should be cited. Furthermore, it seems fairly clear that the date given reflects the volume for January to July 1975 but not the actual date of issue.

In fact, it would appear that there is some question as to whether Regalado's systematic papers ascribed to this journal

were ever really published at all. We quote here in full from the pertinent portion of a manuscript in press by Gilberto Silva and Orlando Garrido entitled "Compendio de los vertebrados terrestres cubanos" (supplied by Garrido, in litt., 4 November 1987):

Obra en nuestro poder certificación escrita del Presidente del Comité Editorial de la *Revista Forestal Baracoa* (que es como se llama este órgano seriado), Ing. Juan A. Herrero, fechada el 2 de Junio de 1986, en la que se especifica que ese órgano no ha publicado artículos de Regalado relacionados con los nombres en cuestión, así como que "en su fondo de artículos aprobados y pendientes de publicar, no posee ninguno del autor Pedro Regalado Ruíz, así como ninguno otro, que haga referencia a dichas especies."

Teniendo en cuenta que han sido infructuosas todas las pesquisas bibliográficas realizadas a este respecto, en torno a otros posibles órganos editoriales del país, como infructuosas han sido también los esfuerzos por precisar con el propio Regalado el origen de los referidos nombres, consideramos que estas referencias "fantasmas" deben ser definitivamente extirpadas de la literatura ornitológica.

The following details the actual resources available to us concerning the publication of new taxa by Regalado.

Regalado Ruíz, Pedro

1977a. Nueva subespecie de *Contopus caribaeus* (Aves) para Cuba. [Our copy was evidently clipped out of a stapled or sewn sheaf, the pages bearing no indication of the source, only the barely legible page numbers 37–40 at the bottom. Our only knowledge of the source of this is Bond (1984) who gives it as "*Rev. Forestal*, Nos. 1–2, 1977." The first use of *Contopus caribaeus florentinoi* appears on page 40.]

1977b. [Original description of *Xiphidiopicus percussus marthae*, nueva subespecie]. [Our only copy of this was supplied by Regalado and was evidently also cut from a sheaf. It consists only of page 37, with the lines "*Xiphidiopicus percussus marthae*, nueva subespecie." clipped evidently from the preceding page and glued at the top. The entry "*Revista Forestal* No. 3, 1977, p. 36–" has been penned in at the top and "37" at the bottom, the citation being the same as given by Bond (1984). We assume that there was also at least probably a title, the author's name, and perhaps some introductory material as well on page 36.]

1981. El género *Torreornis* (Aves, Fringillidae), descripción de una nueva subespecie en Cayo Coco, Cuba. Pages 87–112, 3 tables, 6 figures. [Olson received a reprint of this from Regalado. The only indication of the source on this is printed at the top of page 87: "Centro Agrícola, No. 2 mayo-agosto/1981." This is the citation given by Garrido et al. (1986), whereas Bond (1982:12) cites the original description of *Torreornis inexpectata varonai* Regalado as "*Rev. Minist. Educ. Sup. Rep. Cuba*, 8, Nov. 2, 1981, pp. 87–106.," that, apart from the initial page number being the same, would seem to be a different publication.]

[date?] [Bond (1984:2) mentions the introduction of the name *Melanerpes superciliosus rosamariae* Regalado Ruíz from Cayo Coco but did not have the reference. (Unfortunately, the words "*rosamariae* Regalado Ruíz" were transposed to the following line and were replaced by "*cocoensis* H. Garrido"). Regalado sent Olson a typewritten copy of the original description of this supposed new subspecies, but did not say whether or where it had been published.]

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