

MIGRANTS IN THE GALÁPAGOS AREA¹

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The last comprehensive report on migrant birds in the Galápagos region was published more than 30 years ago by Swarth (1931) who excluded most of the procelariiform species previously considered by Gifford (1913) and Loomis (1918). Subsequently, a number of records obtained at sea and on the islands were reported by various authors, chiefly Fisher and Wetmore (1931), Swarth (1933), Murphy (1936), Lack and Venables (1940), Fleming (1950), and Harrison (1962).

During the 12-year period, 1952 to 1964, visits were made by one or more of the present writers to all the principal islands of the Galápagos Archipelago (fig. 1), with numerous opportunities to observe and to collect at infrequently visited coasts and inland areas. The purpose of this report is to bring together all records of Galápagos migrants that have accumulated since 1931 and thereby make available a more up-to-date summary of species occurrences, distribution, and relative abundance.

The term "Galápagos area," as used here, includes the islands and intervening waters of the Galápagos Archipelago, plus a circular band of open ocean, approximately 200 miles in width, measured from the perimeter of a circle that passes through Culpepper and Hood islands (fig. 2). Thus this region in the eastern equatorial Pacific encompasses a circular area of 385,000 square miles, and is approximately 700 miles in diameter. The easternmost end of Chatham Island (Punta Pitt) is 502 miles west of Cape San Lorenzo on the Ecuadorian mainland (Slevin, 1955:99). Guadalupe Island (México), Socorro Island in the Revillagigedo Archipelago, and Clipperton atoll are approximately 2700, 1700, and 1300 miles, respectively, northwest of Culpepper Island in the Galápagos. To the northeast, Cocos Island (Costa Rica) and Malpelo Island (Colombia) are approximately 425 and 630 miles, respectively, from Tower Island in the Galápagos. The nearest land west of Galápagos is the island of Fatu Hiva in the Marquesas, about 2800 miles distant. The islands of San Félix and San Ambrosio (Chilé) and Sala-y-Gomez and Rapa Nui (Chilé) are about 1600 miles to the SSE and SSW, respectively, of Galápagos. The perimeter of the Galápagos area comes to within about 140 and 320 miles of Cocos Island and the nearest Ecuadorian mainland, respectively.

To be sure, the limits of the Galápagos area have been chosen somewhat arbitrarily, since they cut across several oceanographic and meteorological provinces (Abbott, MS; Alpert, 1963; Murphy, 1936). Nevertheless, it is because of this unusual setting that so many interesting avian distributional discoveries are occurring and will continue to do so. The need for more thorough observing and collecting in the Galápagos is clearly indicated by the data presented below.

ANNOTATED LIST OF SPECIES

In the following notes we have included records of occurrences of all nonbreeding birds; recent distributional data on breeding species are reported elsewhere (see Lévêque, 1964b). The relative abundance of migrant species is indicated by the terms "accidental" (only one or two records of occurrence), "rare" (three to nine records), and "common" (more than nine records). When seasons are mentioned it is with reference to the annual cycle in the northern hemisphere, that is, fall (September–

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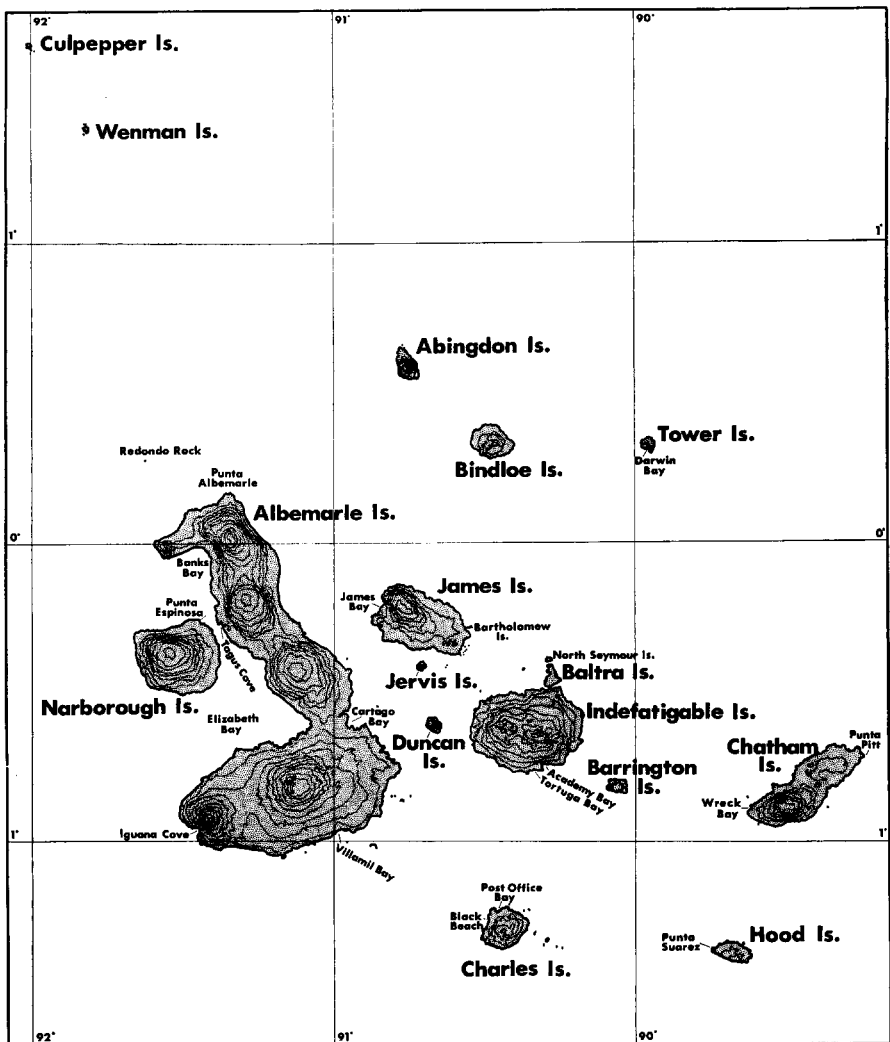


Figure 1. Map of the Galápagos Archipelago showing the principal islands and locations mentioned in the text.

November), winter (December–February), spring (March–May), and summer (June–August).

Periods of observation by the writers are as follows: Lévêque, intermittently from February 1960 to March 1962; Bowman, November 1952 to May 1953 and July to November 1957; Bowman and Billeb, November 1961 to March 1962 and January to February 1964. Other visitors who have contributed their observations had the following periods of residence in the Galápagos: Brosset, intermittently from February 1962 to January 1963; Curio and Kramer, from September 1962 to September 1963; and Snow, intermittently from February 1963 to June 1964.

The nomenclature used below is essentially that of the AOU Check-list, fifth edition

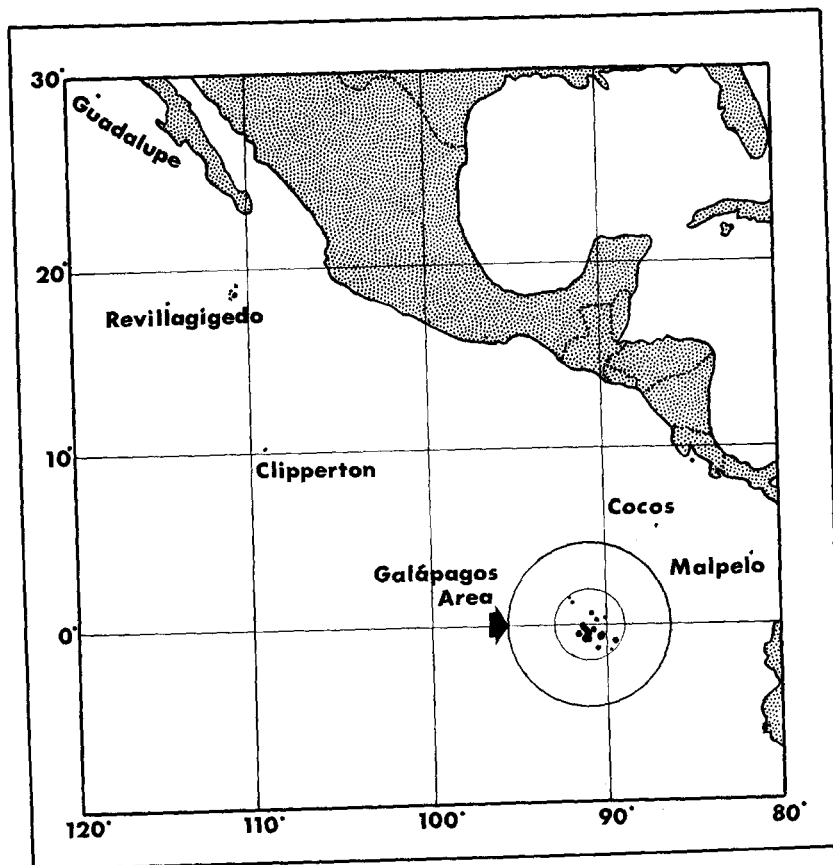


Figure 2. Map of the tropical eastern Pacific showing the position of the main volcanic islands and the extent of the "Galápagos area."

(1957), Murphy (1936), and Swarth (1931), with certain modifications based on recent published opinions. It is not our intention, nor is it within our competence, to discuss subspecific identifications for most of the species. An asterisk after a scientific name indicates that the occurrence in the Galápagos is substantiated by a specimen.

1. *Podilymbus podiceps*. Pied-billed Grebe. Accidental. One bird was observed (Bowman) swimming close to the edge of the mangrove-bordered lagoon at Academy Bay on 15 December 1961 (fig. 3). The same individual, presumably, was seen subsequently (until 19 December) by several local people, two of whom are quite certain that a like-appearing water bird was present in the same general area in March 1960. This species has not been reported previously in the Galápagos.

2. *Daption capensis**. Cape Petrel. Rare. One bird was seen (Lévêque) in company of about 100 storm petrels (F. Hydrobatidae), feeding at a whale carcass midway between Tower and Bindloe islands on 23 October 1961. A mounted specimen of this species, obtained by the taxidermist Perez halfway between the Galápagos Islands and the Ecuadorian mainland in September 1937, is in the Colegio Militar, Quito. P. P. O. Harrison (*in litt.*) saw two birds at lat. 3° 05' S, long. 91° 05' W on 16 May 1957; and another bird 4 September 1956, at lat. 2° 40' S, long. 90° 55' W. R. C. Murphy informs us that he has observed *Daption* several times near the equator off

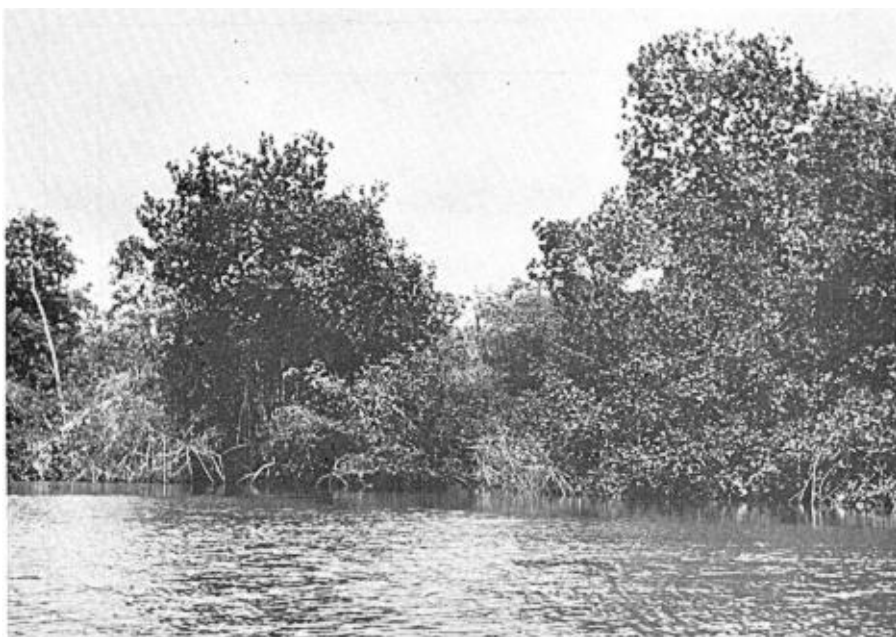


Figure 3. Inner lagoon at Academy Bay, Indefatigable Island. The shallow salt water and the dense foliage of the mangroves offer potentially attractive habitats to many species of migrant birds. Potable water is permanently available a short distance away. Photo by Bowman.

the Ecuadorian coast. This species should probably be considered a regular although uncommon visitant to the Galápagos area.

3. *Puffinus pacificus*.* Wedge-tailed Shearwater. Rare. P. P. O. Harrison (*in litt.*) saw three birds at lat. 1° 40' N, long. 86° 00' W on 3 September 1956, and one at lat. 3° 24' N, long. 84° 12' W on 23 November 1958. One specimen (Amer. Mus. Nat. Hist. no. 527.564) was obtained by Rollo Beck on 7 August 1902, "NW of Galapagos." This species is known to occur regularly off the northwest coast of South America (Eisenmann, *in litt.*), and was seen in numbers as far south as the Gulf of Guayaquil on 14 March 1962 (Lévêque, 1964a:53).

4. *Procellaria parkinsoni*.* Parkinson Petrel. Accidental. Since the first specimens were taken from the Galápagos during the 1905 to 1906 California Academy of Sciences expedition in May, June, and October (cf. Loomis, 1918:108), no further records have come to our attention.

5. *Pterodroma leucoptera*.* White-winged Petrel. Rare. This tropical South Pacific gadfly petrel is known in the eastern Pacific by only eight specimens obtained by Rollo Beck on 11 June 1906, at lat. 4° 20' S, long. 93° 30' W, out of flocks composed of as many as 15 birds (Loomis, 1918:93). Murphy recently informed the senior author that Beck's specimens belong to an undescribed race and not to the hitherto accepted form *brevipes*.

6. *Pelagodroma marina*.* White-faced Petrel. Rare. Murphy (1936:770) lists occurrences in the vicinity of Galápagos, including a specimen obtained by R. H. Beck on 18 June 1906, about 60 miles due south of Albemarle Island. An adult male in molting condition was taken by E. F. Stead about 100 miles southwest of Galápagos in September 1930; this specimen is part of the New Zealand Canterbury Museum collection (R. A. Falla, *in litt.*). The following reports come from regions just beyond the Galápagos area. On 4 August 1960 and 18 July 1961, about halfway between the Ecuadorian mainland and the Galápagos, two and seven birds, respectively, were seen moving northward (Lévêque). Beebe (1926:329) reported one bird coming aboard ship on 16 June 1925, in the vicinity of lat. 1° 40' N, long. 86° 06' W. Jespersen (1933) saw one bird, possibly this species, on 21 September 1928, at lat. 2° 04' S, long. 107° 35' W.

7. *Oceanodroma leucorhoa*. Leach Petrel. Rare. Both the nominate and the *socorroensis* races are known migrants in the vicinity of Galápagos (AOU, 1957:21). But the male specimen of *socorroensis* mentioned by Friedmann (1945:314) was taken at lat. 4° 40' N, long. 80° 08' W, which is outside the Galápagos as here defined. Loomis (1918:170) lists three specimens of the nominate race taken at sea at lat. 4° 20' S, long. 93° 30' W on 11 June. Although somewhat outside the area covered by this report, the following records suggest that the species probably occurs more or less frequently within the Galápagos Archipelago proper, from where it is yet to be collected. C. A. Fleming (*in litt.*) took one bird of the nominate race 25 November 1948, at lat. 5° 11' S, long. 94° 40' W. The bird was in faded molting plumage. Two males were obtained by J. C. Yaldwyn in December 1956, at lat. 9° 13' S, long. 106° 24' W. The latter are cataloged in the Dominion Museum (New Zealand) as nos. 8582 and 8593 (R. A. Falla, *in litt.*). A. Lysaght procured one bird on 15 December 1955, at lat. 7° 33' S, long. 104° 04' W. This specimen is kept in the British Museum of Natural History.

8. *Oceanodroma markhami** Markham Storm Petrel. Rare. The first Galápagos record of this petrel is a male taken by William Beebe on 12 July 1925, off Narborough Island. This specimen, incorrectly labeled *O. leucorhoa*, was recently discovered by Eisenmann in the collection of the American Museum of Natural History, where other sea birds taken during the "Arcturus" expedition are housed. "The bird has all dark upper tail coverts and measures as follows: wing 166, tail 89, culmen 17.9, tarsus 24, middle toe and claw 24 [mm.]" (Eisenmann, *in litt.*). These measurements are diagnostic of *O. markhami* (cf. Murphy, 1936:739). In 1933 Jespersen reported a single bird noted about 100 miles northeast of Galápagos in September 1928, although he admits that possible confusion with *Loomelania melania* is not excluded. Fleming (1950:176) observed an "all black" petrel, probably *O. markhami*, on 17 July 1948, northeast of Abingdon Island.

The following observations of dark petrels were made by Lévêque at a distance of up to 160 miles east of Chatham Island: one bird 31 May 1960; two observations of one bird 25 April 1961; three observations of one bird 29 May 1961; and one bird 8 October 1961. In all cases the birds did not follow the ship, as is most typical of *Loomelania melania* (Murphy, 1958) with which they might have been confused. Furthermore, *O. markhami* is endemic to the Humboldt Current and more likely to occur in Galápagos waters than is *L. melania*, since the latter is more typical of warm waters. However, Loomis (1918:174) reports two specimens of *O. markhami* obtained near Cocos and Clipperton islands, thus suggesting that the species is not rigidly limited to the Humboldt Current.

9. *Fregatta grallaria** White-bellied Storm Petrel. Rare. The only known specimen from the Galápagos area was obtained by R. H. Beck on 11 June 1906, southeast of Albemarle Island (Loomis, 1918:182), where additional birds were seen on subsequent days. C. A. Fleming (1950:176) reports one observation on 17 July 1948, just north of the Archipelago. It should be noted that all records for this species, as well as for *Pelagodroma marina*, were obtained in summer and early fall at the time of strongest SE trade winds and coolest ocean waters in the Galápagos area.

10. *Bubulcus ibis*. Cattle Egret. Rare. The first unquestionable observation of this species in the Galápagos was made by Miguel Castro on 2 November 1964, in new farmland in the southwestern section of Indefatigable Island. One white bird was seen standing among cattle, pecking at their legs. The observer noted the yellow bill, black legs, and yellow eyes, and judged the size to be about one-half that of the resident Great Blue Heron. The yellow bill is characteristic of nonbreeding Cattle Egrets. Subsequently, two or three birds were seen standing among domestic stock on 11, 12, and 20 November and again 8 and 15 December 1964 and 30 January 1965. These observations confirm a previous suspicion of the occurrence of Cattle Egrets in Galápagos. For example, Alf Kastdalen who also lives in the farming regions of Indefatigable Island about four miles north of Academy Bay described to David Snow a small white heron standing among cattle. The exact date of this observation is unknown. Finally, on the morning of 16 July 1960, eight small white herons were seen (Lévêque) flying low over Academy Bay, Indefatigable Island. Unfortunately, leg and bill color could not be determined. But the small size of the birds left no doubt about their distinctiveness from the resident *Casmerodius albus*. These vagrant herons were seen by several people later in the day resting in mangroves near the village, and also singly or in

groups of two in the interior of the island. One villager reported six egrets two or three days earlier in the Academy Bay region. Weather data for 12 and 13 July 1960 indicate that unusually warm and calm conditions prevailed at Indefatigable Island, followed by cloudy skies and very strong, almost gale-force SE winds 14 to 15 July. Although at the time no definite species assignment could be made (the birds might have been *Egretta thula* or possibly immature *Egretta coerulea*), it is probable that the birds were Cattle Egrets. Herons are known to make exceptionally long crossings over water, as is well illustrated by the capture alive of a Cattle Egret between Clipperton and Cocos islands (Lint, 1962:483). Segal (1964:2) observed four white egrets in August 1961, approximately 400 miles from the nearest land, en route from Panamá to Galápagos. The birds circled ship several times before heading westward. Cattle Egrets are now occurring regularly along the coast of Perú (Frazier, 1964:553), Ecuador (Lévêque, 1964a:55), and Colombia (Lehmann, 1959; Wetmore, 1963), from which regions they might wander as far as the Galápagos.

11. *Dendrocygna autumnalis*. Black-bellied Tree Duck. Accidental. The following observation was made by La Prelle Edens of Los Angeles, California, on 2 July 1960, in the vicinity of Villamil, Albemarle Island. "When I first saw it I'd say we were 100 feet away. We got about 50 feet closer. It flew, whistling, showing the extensive white on the wing. I have seen Tree Ducks often in México, and recently in Honduras and Costa Rica. The long legs and whistle are very distinctive, and the white wing patches, black belly, and reddish bill made it *D. autumnalis* rather than *D. bicolor*. The one thing that bothered me was that the breast was gray rather than cinnamon colored." But Mrs. Edens was apparently unaware of the fact that the southern race of *D. autumnalis*, namely *discolor*, has a gray breast, thus indirectly confirming her careful observation. The nearest mainland area where tree ducks are found regularly is in the Guayas basin of western Ecuador, and the race is recorded northward to eastern Panamá (Delacour, 1954:49).

12. *Anas discors*.* Blue-winged Teal. Common. The first specimen of this species from the Galápagos was obtained at a salt lagoon near Villamil, Albemarle Island, on 23 August 1906 (Gifford, 1913:80). The second known specimen was obtained (Lévêque) on a salt lagoon by Tortuga Bay, Indefatigable Island, on 15 December 1961 (female, in the Vertebrate Museum, San Francisco State College). Recently, a male bird in eclipse plumage was taken by Miguel Castro on Indefatigable Island in October 1964. In addition to the earlier sight records of Blue-winged Teal from Chatham and Albemarle islands during February, March, and August (Gifford, 1913), we have the following: Tortuga Bay, Indefatigable Island, two on 23 February and two on 15 December 1961; Cerro Camote (approx. 8 miles N Academy Bay), Indefatigable Island, four on 1 April, two on 13 December, one on 27 December 1961, and four on 29 January 1962 (Lévêque), and four on 27 October 1964 (Castro).

André Brosset reports two birds on the crater lake El Junco, Chatham Island on 6 February 1962. David Lack told the senior author of seeing this species on Chatham Island in late 1938 or early 1939.

This duck has been reported on Chatham, Indefatigable, and Albemarle islands in the Galápagos, in salt-water ponds near the sea, and in fresh-water ponds in the forested highlands. Records are most frequent from December to April.

13. *Pandion haliaetus*.* Osprey. Common. The only specimen from the Galápagos was obtained near Villamil, Albemarle Island, on 1 November 1905 (Gifford, 1913:193). The species has been observed on 25 August 1905, at Villamil (Gifford, 1913), on 2 July 1961 (Lévêque) and during September 1961, at Narborough Island (reported to Lévêque by Castro), on 14 February 1906, at Chatham Island (Gifford, 1913), on 4 June 1960, at Villamil, Albemarle Island, on 14 June 1961, at Chatham Island (all by Lévêque). One bird was seen by Snow at Tagus Cove, Albemarle Island, on 25 June 1963. Curio (*in litt.*) saw this species at Academy Bay, Indefatigable Island, on 6 and 16 November 1962. On 23 December 1964 Alf Kastdalen observed a bird fishing in Academy Bay (Castro, *in litt.*). The following sight records of the Osprey were made available by Miguel Castro: north end of Albemarle Island, 7 July 1964 and 7 January 1965; north side of Indefatigable Island, 12 January 1965; Academy Bay, Indefatigable Island, 24-25 January 1965; and at various other places and times, with details unrecorded. By these records the species would appear to be a common and more or less regular visitor to the Galápagos.

14. *Falco peregrinus*. Peregrine Falcon. Rare. On 21 November 1952, approximately two



Figure 4. Sand beach at Cartago Bay, Albemarle Island. Migrants such as Sanderlings, Semipalmated Plovers, Spotted Sandpipers, and Wandering Tattlers are most frequently seen in this habitat, uncommon in Galápagos. Photo by Bowman.

days out from the Galápagos, NE of Culpepper Island, Bowman saw an immature Peregrine Falcon alight on the mainmast of his ship. The bird spent the day catching storm petrels and remained with the ship until late morning the following day. On 8 November 1961, at Academy Bay, Indefatigable Island, Billeb was alerted by the calls of Whimbrels, which although excited were reluctant to take flight. Near shore he observed a large falcon making repeated dives at the shore birds. The pattern of marking on the head and the color of the dorsum indicate that it was this species. David Snow (*in litt.*) observed a bird of this species swooping at sea birds on Plaza Island (east end of Indefatigable Island), 30 January 1964. On 27 and 28 November 1964 Miguel Castro (*in litt.*) observed a Peregrine Falcon harass Blue-footed Boobies on Daphne Island. Also on 28 November a bird was seen again by Castro and Brian Nelson at nearby Baltra Island where it made two unsuccessful attacks on Lava Gulls. A large "falcon" of unknown identity was seen by Drowne on 27 and 29 November 1897, near Tagus Cove, Albemarle Island (Rothschild and Hartert, 1899:132).

The AOU Check-list (1957:119) does not mention previous records of this species from any of the eastern tropical Pacific islands, although Brattstrom and Howell (1956:114) saw it on Socorro Island, Revillagigedo Archipelago, on 18 November 1953, and R. C. Murphy (*in litt.*) and Bond and de Schauensee (1938:156) mention it from Malpelo Island, Colombia.

15. *Porphyryula martinica*.* Purple Gallinule. Accidental. Miguel Castro found a recently dead adult bird floating in the ocean along the north side of Indefatigable Island on 13 February 1964. David Snow examined the specimen, which is now preserved in the collection at the Darwin Research Station. This species is well known as a vagrant, even in such distant places as Scilly Islands off southwest England (Nisbet, 1960:146) and Tristan da Cunha (Elliott, 1957:579).

16. *Charadrius semipalmatus*.* Semipalmated Plover. Common. Small groups, including as

many as 16 individuals, have been seen on most of the islands, not only in the coastal regions but also in the grassy highlands. Several birds were collected by Bowman on cultivated land in the interior of Charles Island, 20 September 1957, and on a sandy beach at Tortuga Bay, Indefatigable Island, 12 October 1957. The species was sighted at Punta Espinosa, Narborough Island, 18 December 1962 (Curio). Certainly there are hundreds of this shore bird in the Galápagos during the northern hemisphere winter. Its voice is clearly distinguishable (Lévêque) from that of the western European *Charadrius hiaticula*.

17. *Squatarola squatarola*.* Black-bellied Plover. Common. A regular winter visitor to the Galápagos, it was reported by Gifford (1913:53) throughout the year except from 25 April to 28 July. Wollebaek collected three birds on Charles Island in the fall of 1925 (specimens in the Zoological Museum, University of Oslo). Swarth (1933:40) noted the species at Villamil on 27 and 29 April, and on Narborough Island 31 May. Subsequently, Lévêque has seen it twice in June, and five times in July, indicating that a small population summers in the archipelago. The largest flocks containing up to eight birds were noted (Lévêque) from December to February, although a flock of 10 birds was seen by Swarth (1933:40) in April. Since suitable habitat for shore birds is very limited in the islands (figs. 4 and 5), there cannot be a large population there at any one time. To the islands mentioned by Gifford (1913:52) where this species has been recorded, we now add Bindloe. We have observed no birds in partly black plumage.

18. *Aphriza virgata*.* Surfbird. Rare. Although not previously recorded in the Galápagos, one specimen with new flight feathers was obtained near James Bay, 25 October 1961 by Lévêque (no. 1962-278, Museum National D'Histoire Naturelle, Paris), and two more were seen on the same island 26 October. Bowman saw one bird at Academy Bay 6 November 1961.

19. *Arenaria interpres*.* Ruddy Turnstone. Common. Although a year-round visitor, it occurs in greatest numbers from October to April. Lévêque has observed five birds in June and as many as 10 in July. E. Curio reports the species on the north side of Hood Island on 29 August 1963, and five or six birds at Darwin Bay, Tower Island, from the end of May to the beginning of August 1963. Large flocks containing more than 30 individuals have been seen in October. Generally, groups of from one to 12 birds are to be found scattered along the coast. One adult male was collected by Bowman on 31 March 1953, at Academy Bay. In addition to a heavy deposit of subcutaneous fat, the bird was undergoing a general body molt. The largest testis was less than 2.0 mm long. Probably through oversight the Ruddy Turnstone has not yet been reported from Duncan Island.

20. *Numenius phaeopus hudsonicus*.* Whimbrel. Common. This species has been reported in Galápagos in every month of the year. As many as six birds have been seen together in June and July. There are no occurrences reported for Abingdon, Barrington, Bindloe, Culpepper, and Wenman islands. The Whimbrel is one of a group of shore birds (others are *Charadrius semipalmatus*, *Arenaria interpres*, *Tringa solitaria*, *Totanus flavipes*, *Himantopus himantopus*) seen occasionally in the treeless uplands of Chatham, Charles, and Indefatigable islands. The large salt-water pond at Post Office Bay, Charles Island (see fig. 5), is a roosting ground of some importance for this and other species of shore birds. For example, on 20 January 1962 about 270 Whimbrels came to it until 1815 when it was almost dark (Lévêque). If an island such as Charles, which is only about 10 miles in its greatest diameter, can support so many individuals, one wonders how many might be wintering elsewhere in the Archipelago. But the population that spends the night at Post Office Bay possibly is attracted there from more distant areas.

Mention should be made here of a specimen of the Eskimo Curlew (*N. borealis*) taken on Charles Island, originally reported by Salvin (1883:429) and subsequently cited by Ridgway (1896:633). This apparent pen slip was corrected by Rothschild and Hartert (1899:189), who identified the specimen as *N. phaeopus*.

21. *Actitis macularia*.* Spotted Sandpiper. Common. Lack and Venables (1940:730) concluded that this shore bird is "evidently a regular visitor to the Galapagos." Our observations confirm this view but also indicate that it is never abundant. The species is largely solitary, although out of 21 observations (Lévêque) between 11 October and 23 April, two were of two birds, and two were of three birds. Most commonly seen at Academy Bay, and occasionally at Chatham and Charles islands, the species was reported by Gifford (1913:56) at Abingdon and Albemarle

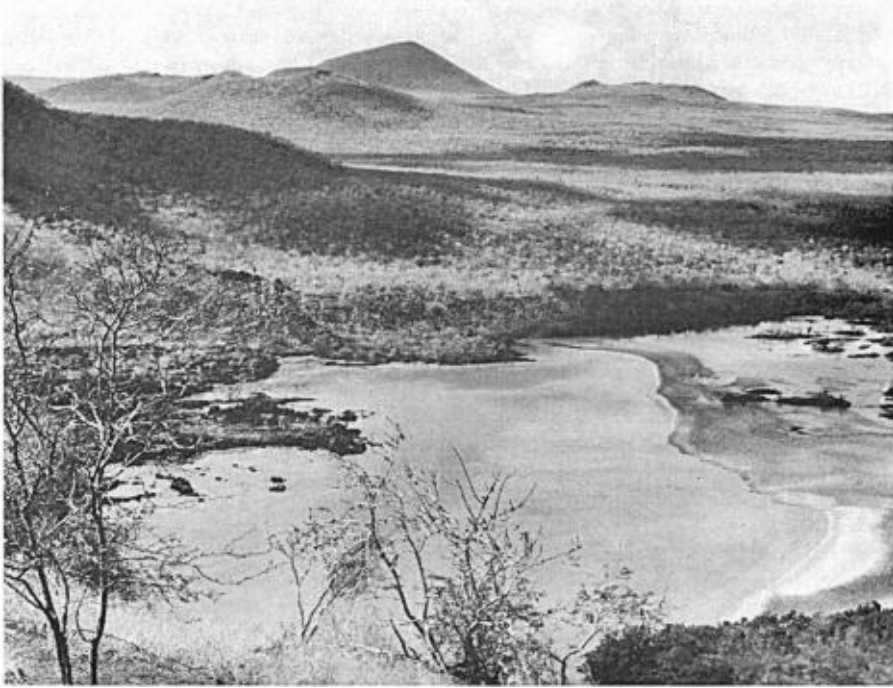


Figure 5. Salt-water mudflats at Post Office Bay, Charles Island. This is one of the largest and most attractive feeding-roosting areas for migrant shore birds in Galápagos. Photo by Bowman.

islands. Latest spring record is 2 May at Villamil (Gifford, 1913); earliest fall record is 20 September at Black Beach (Bowman). A female was taken by Lévêque at Academy Bay, Indefatigable Island, on 10 December 1961 (specimen in the Vertebrate Museum, San Francisco State College).

22. *Tringa solitaria*.* Solitary Sandpiper. Rare. Rothschild and Hartert (1899) reported two birds collected 12 October and Lack and Venables (1940) saw one bird at intervals from late December to February at a pond at Progreso. Both observations were made on Chatham Island. On 15 October 1961 one bird was seen at close quarters (Lévêque) in a small fresh-water pond at the 700-foot elevation on Indefatigable Island where it had been reported for about one week previously by Alf Kastdalen.

23. *Heteroscelus incanum*.* Wandering Tattler. Common. A regular visitor to the Galápagos, it has been seen on all the major islands. The species is spread out along sandy and rocky shores singly and in pairs during the day, and in groups of six to 10 birds has been seen in brackish ponds at dusk. Considering the very long shoreline in the Galápagos (approx. 800 to 900 miles), one can only guess that thousands of birds probably could be accommodated, and the islands are probably one of the major wintering grounds for the species. Birds can be found during every month of the year, and there are several observations of small groups (usually two birds) in June and July (Lévêque) and in August (Curio). A male collected at Academy Bay on 29 December 1952 (Bowman) had five fiddler crabs (*Uca* sp.) in its crop.

24. *Catoptrophus semipalmatus*.* Willet. Rare. The three records reported by Gifford (1913:55)—one at Villamil, Albemarle Island, in September and November, and another on Abingdon Island in September—were the only ones until 18 December 1925, when A. Wollebaek collected a female (no. L15453) on Charles Island. Subsequently, the species has been observed as follows: 19 November 1957, two birds at Academy Bay, Indefatigable Island (Bowman); one

at Tortuga Bay 27 September 1961 and 15 December 1961 (Lévêque); two at Academy Bay 24 December 1961 (Bowman); and one collected at James Bay 25 October 1961 (Lévêque). The last-named specimen (unnumbered) is kept in Paris (MNHN). Its measurements are as follows: wing (chord) 205 mm, exposed culmen 63 mm, tarsus 73 mm, and middle toe 39 mm. From these data we infer that the Galápagos specimen is of the race *inornatus*. The Willet may be considered to be a regular fall migrant in Galápagos.

25. *Totanus melanoleucus*. Greater Yellowlegs. Rare. This species was first reported in the Galápagos at James Island in April 1923 (Beebe, 1924:153). Subsequent records are as follows: one bird at Villamil 29 April 1932 (Swarth, 1933:40), two birds at Academy Bay in February and March 1939 (Lack and Venables, 1940:730); one bird at Tortuga Bay 2 April 1960, one bird at Charles Island on both 31 July 1960 (size comparison made with *Himantopus*) and 20-21 January 1962 (Lévêque).

26. *Totanus flavipes*.* Lesser Yellowlegs. Rare. First reported by Lack and Venables (1940:731), who saw two or three birds beside the pools and swamps in the highlands of Chatham Island from December 1938 to March 1939. During March 1939 the species became more abundant, and at least 12 individuals were seen together at the crater lake ("El Junco"). More recent observations are as follows: one at Villamil, 14 February 1961 (Lévêque); two at Wreck Bay, 5 November 1961 (Bowman and Billeb); one on 24 November 1961 (shot but specimen not kept) and two on 30 January 1962, at Charles Island (Lévêque); and one or two birds intermittently from 19 November to 31 December 1961, around Academy Bay (Bowman and Lévêque) with a female collected by Lévêque on 10 December 1961, housed in MNHN, Paris; also at Academy Bay, Brosset collected a male and a female 8 October 1962, and another female 31 October 1962 (specimens in the collection of the Darwin Research Station); one seen 12 February 1962, at Darwin Bay, Tower Island (Bowman and Billeb).

27. *Erolia melanotos*.* Pectoral Sandpiper. Accidental. One specimen was obtained by Castro in the Miconia belt (upland shrub-fern formation) of Indefatigable Island in October 1964. This is the first record of the species for the Galápagos. The study skin is housed in the Vertebrate Museum, San Francisco State College.

28. *Erolia bairdii*.* Baird Sandpiper. Rare. A male and a female were collected on Hood Island, 23 September 1957 (Bowman), and these specimens are catalogued in the Museum of Vertebrate Zoology under numbers 140949♀ and 140950♂. The only previous record of this species in the Galápagos was obtained on Barrington Island, 6 October 1897 (Rothschild and Hartert, 1899:188).

29. *Erolia minutilla*.* Least Sandpiper. Common. This visitor has been reported from many of the main islands (Swarth, 1931:59). Ten observations made by Lévêque on the islands of Charles, Chatham, Indefatigable, and James, from 25 October to 27 April at brackish ponds, include flocks as large as 15 birds. Wollebaek collected five birds on Charles Island in October 1925 (specimens in the Zoological Museum, University of Oslo, catalog nos. L15550 to -54 incl.).

30. *Micropalama himantopus*.* Stilt Sandpiper. Rare. Swarth (1933:40) first reported this shore bird in the Galápagos near Villamil, Albemarle Island, on 27 and 28 April 1932 (two birds in bar-breasted plumage). One specimen is in the collection at the Charles Darwin Research Station, taken by Brosset 8 October 1962, near Academy Bay, Indefatigable Island.

31. *Limnodromus griseus*.* Short-billed Dowitcher. Rare. The first observation of this species in the Galápagos was made by Lévêque near Villamil, Albemarle Island, on 14 March 1960 (one bird). Subsequently, he noted three birds on James Island, 26 October 1961; one was photographed, and one male in first winter plumage was collected. Another individual (unsexed adult completing postnuptial molt) was taken (Lévêque) on Charles Island, 24 November 1961. Both specimens were examined by Frank A. Pitelka who identified them as belonging to the race *caurinus*. The specimens are cataloged under nos. 1962-279 and -280, MNHN, Paris.

32. *Ereunetes pusillus*.* Semipalmated Sandpiper. Rare. On 24 November 1961, at Charles Island, three birds were collected by Lévêque (MNHN nos. 1962-282, -283, -284). This species has not previously been known from the Galápagos. Moreover, small sandpipers, either *E. pusillus* or *E. mauri*, were noted in groups of from two to five individuals on the following occasions

(Lévêque): Albemarle Island, 14 March 1960 and 28 June 1961; Indefatigable Island, 29 March 1960, 22 September 1961, and 9 January 1962; and Charles Island, 20 January 1962.

33. *Ereunetes mauri** Western Sandpiper. Rare. First evidence of this species in the Galápagos was obtained on 26 October 1961, when a bird was collected on James Island (Lévêque). The specimen is cataloged as no. 1962-285 in the Museum National d'Histoire Naturelle, Paris. Another bird was collected, but not preserved, and two more were seen (Lévêque) in the company of *E. pusillus* on Charles Island, 24 November 1961.

34. *Limosa fedoa*. Marbled Godwit. Accidental. On 9 November 1957 several godwits were seen and heard (Bowman) along the shore of Academy Bay. This constitutes the first record of this wader from the Galápagos. *L. fedoa* occasionally occurs at the Gulf of Guayaquil on the adjacent mainland of Ecuador (Chapman, 1926:194).

35. *Crocethia alba** Sanderling. Common. A regular visitor to the Galápagos, this species was seen along the beaches near Academy Bay (Lévêque and Bowman), and on the north shore of Indefatigable Island (Curio), on Albemarle and James islands (Lévêque), and at Punta Espinosa, Narborough Island (Curio). The species has not yet been reported from Duncan, Tower, Wenman, and Culpepper islands, where there are essentially no large sandy beaches. Flocks of from 20 to 50 birds were most common, although one group of about 100 birds was seen in March. Rarely have these birds been seen in saline lagoons (Gifford, 1913:56). There are no reports of Sanderlings during April and May.

36. *Phalaropus fulicarius** Red Phalarope. Accidental. The first record for the Galápagos area is that of Jespersen (1933) who captured one male aboard ship on 14 September 1928, between lat. 3° 31' N, long. 86° 55' W; the second record is that of a female taken at Narborough Island on 25 August 1929 (Fisher and Wetmore, 1931:41). It does seem probable, however, that this species has been overlooked in flocks of Northern Phalaropes. Gifford (1913:57) mentions two collected on 18 August 1905 at lat. 7° 24' N, long. 103° 52' W, which is outside the Galápagos area proper. Nonetheless, all reports of this species in or near the Galápagos fall within a restricted period, presumably because the birds are en route to their more southern wintering grounds. This may explain the apparent scarcity of the species in Galápagos.

37. *Lobipes lobatus** Northern Phalarope. Common. A conspicuous migrant and winter visitor on the open ocean as noted previously by many observers. The earliest fall migrants were seen by the hundreds on 13 August south of James Island, and the latest spring observation was made on 10 April when two or three flocks of about 20 birds each were seen in Banks Bay (Gifford, 1913:57). The largest flocks occur from August to November (hundreds) and from December to February (thousands), with numbers falling off sharply in March (largest flock contained 60 birds). This species was most frequently encountered between the islands of Chatham, Hood, Charles, and Indefatigable; far fewer birds have been reported in the northern half of the Archipelago (except Banks Bay), but these waters are traversed somewhat less frequently than more southerly ones. Two males and two females (MNHN nos. 1962-287, -288, -289, -290) were collected near Hood Island on 25 November 1961 (Lévêque).

38. *Steganopus tricolor** Wilson Phalarope. Rare. Gifford (1913:57) reports two males and one female in postjuvenile molt taken near Villamil on 3 November 1905, and Wollebaek collected four birds in September 1925, on Charles Island (specimens in the Zoological Museum, University of Oslo, catalog nos. L15565 to -68 incl.). That the Wilson Phalarope is probably a regular fall visitor is indicated by the following observations (Lévêque) made in 1961: seven at Tortuga Bay, Indefatigable Island, 22 September; five at James Bay, 26 October; a single bird in the crater lake, Tower Island, 22 October, and at James Bay, 25 October. One bird was collected by Lévêque on Charles Island, 24 November 1961 (MNHN, no. 1962-286), and two were taken by A. Brosset at Academy Bay, 15 October 1962 (Charles Darwin Research Station collection). Except for an observation by Brosset (*in litt.*) in late July 1962, on James Island, this species is known in the Galápagos only during the autumn. Birds have been seen only at salt- or brackish-water habitats.

39. *Stercorarius pomarinus** Pomarine Jaeger. Accidental. There is but one certain record of this species from the Galápagos, namely, an immature female taken by Rollo Beck north of Albemarle Island 15 December 1897 (Rothschild and Hartert, 1899:192). Several observations of jaegers (species uncertain) were made by Lévêque as follows: a "light" phase bird west of Inde-

fatigable Island on 6 July 1961, chasing a frigate bird; another "light" individual was seen about 150 miles east of Chatham Island on 21 October 1960, and two together in the same area on 12 December 1960. A "dark" phase bird was noted on 8 January 1961, about 100 miles east of Chatham Island. Apparently, jaegers are quite scarce in the Galápagos area.

40. *Larus atricilla*.* Laughing Gull. Rare. The following records (Lévêque) are the first of this species for the Galápagos: an adult bird observed off SW Albemarle on 12 March 1960; another adult seen about 200 miles east of Chatham Island on 8 January 1961; and an adult female collected (Lévêque) off SE Indefatigable Island on 19 February 1962 (MNHN, no. 1962-4089).

41. *Larus pipixcan*.* Franklin Gull. Common. Previous records for the Galápagos are based on three specimens obtained in February and March (Swarth, 1931:65). This gull is a visitor in very small numbers from October to March. Records are as follows: at Wreck Bay, Chatham Island, a second-year immature was seen on 25 February 1960, a winter-plumaged adult on 22 October 1960, three adults on 1 December 1961, and one adult on the following day (Lévêque). A reliable resident, J. Lundh, reports this gull at Chatham through the winter of 1961-1962. A young Franklin Gull was seen among some Sooty Gulls (*L. fuliginosus*) at Villamil, Albemarle Island, on 14 February 1961 (Lévêque), and several were seen off northern Albemarle Island in November 1962 (Brosset, *in litt.*). Two dead birds were found washed ashore in Post Office Bay, Charles Island, on 22 January 1962 (Bowman and Lévêque). An immature female was collected by Billeb at Academy Bay, Indefatigable Island, on 16 December 1961 (specimen in the Vertebrate Museum, San Francisco State College). One bird in winter plumage was seen by David Snow near Baltra Island on 22 October 1963, and two birds, also in winter plumage, were noted in the same area on 29 January 1964 (Bowman and Billeb).

That this gull can travel extensively over the Pacific Ocean is indicated by recent reports from the Marquesas and Hawaiian islands (King, 1959:226). However, most of the population winters along the continental coasts south to Perú, where Koepcke (1963:409) reports enormous flocks, and also as far south as Chile (Goodall *et al.*, 1951:293).

Young birds of either *L. pipixcan* or *L. atricilla* were seen as follows (Lévêque): two or three between Albemarle and Narborough islands on 12 March 1960; one at Academy Bay, Indefatigable Island, on 11 February 1961, and on 8 March 1960; one off Narborough Island on 26 and 28 February 1962; one first-winter bird seen halfway between Charles and Indefatigable islands on 22 January 1962.

42. *Sterna hirundo*.* Common Tern. Accidental. Lévêque collected an immature bird on Hood Island, 26 November 1961 (specimen in MNHN, Paris). A medium-sized tern, perhaps of this species, was seen near Indefatigable Island on 25 and 29 October 1960 (Lévêque). A small white tern was observed by Lévêque on 8 October 1961, 80 miles east of Chatham Island.

43. *Thalasseus maximus*. Royal Tern. Rare. The first Galápagos observation of this species was made by La Prelle Edens who saw two birds at Villamil on 2 July 1960. Subsequent observations are as follows: one at Villamil, Albemarle Island, on 14 February 1961 (Lévêque), and later the same day at the same place, five were seen (Mrs. Cazenova-Lee); two along the east coast of Albemarle Island on 27 June 1961 (Lévêque); one at Academy Bay, Indefatigable Island, on 10 February 1962 (Lévêque). The Royal Tern is a common winter visitor on the coast of Ecuador and northern Perú (Lévêque, 1964a:59; Marchant, 1958:372), and it is somewhat surprising that the species was not reported earlier from Galápagos.

44. *Gygis alba*. White Tern. Accidental. The report of one bird seen off Tower Island on 14 September 1906 (Gifford, 1913:32) remains unique. The species has been noted about 300 miles southwest of the Galápagos on 15 May 1957 (one bird) by Harrison (*in litt.*), and Warham (*in litt.*) observed a few individuals at lat. 05° 18' N, long. 85° 26' W on 8 November 1961.

45. *Megaceryle alcyon*. Belted Kingfisher. Rare. On 8 December 1961 one bird was seen at Academy Bay, Indefatigable Island, and on 16 and 17 December a close-up view revealed it to be a male (Bowman and Billeb). Also at Academy Bay, one bird was seen by David Snow on 11 December 1963, and several days previously two birds were seen in the same area by a reliable local resident, Miguel Castro, who also observed this species around the lagoon at Academy Bay on 1 December 1964 and 2 and 31 January 1965. On 13 January 1965 he saw an individual



Figure 6. Forest clearing, 800 feet, approximately six miles north of Academy Bay, Indefatigable Island. Bobolinks have been observed regularly in these pastures during the fall and winter months. Photo by Bowman.

along the north shore of Indefatigable Island. On 21 January 1962 the authors pursued a female at Post Office Bay, Charles Island, but all efforts to collect the bird were in vain. Lévêque saw a bird at Darwin Bay, Tower Island, on 20 October 1961 that may have been of this species. The Galápagos records of the Belted Kingfisher appear to be the southernmost for the species.

46. *Riparia riparia*. Bank Swallow. Rare. First reported on Hood Island, 19 April 1932 by Swarth (1933:41), one bird has since been seen on Tower Island, 20–21 October 1961, and another at sea, 270 miles east of Chatham Island on 7 October 1961 (Lévêque). It has only recently been reported from the mainland of Ecuador (Marchant, 1958:383; Lévêque, 1964a:60).

47. *Hirundo rustica*.* Barn Swallow. Rare. Since Swarth (1931:104) summarized the known records, a few more birds have been reported as follows: two birds collected by A. Wollebaek, 5 and 12 October 1925, on Charles Island (specimens in the Zoological Museum, University of Oslo, nos. L15504 and -05); several birds seen on Hood Island, 19 April 1932 (Swarth, 1933:41), and one bird noted on the same island 7 January 1962 (Bowman and Billeb); species noted on Chatham Island in 1938–1939 (Lack, oral communication with Lévêque); single bird seen at Academy Bay on 20, 25, and 27 October by David Snow. Two records of birds at sea outside the Galápagos area are as follows: one bird photographed aboard ship at approximately 300 miles WNW Culpepper Island, 19 November 1952 (Bowman); one bird collected aboard ship about 120 miles WNW Gulf of Guayaquil, 2 November 1961 (Billeb and Bowman). The Barn Swallow is probably a more or less regular winter visitor in the Archipelago, but obviously in extremely small numbers.

48. *Petrochelidon pyrrhonota*. Cliff Swallow. Accidental. Swarth (1933:41) saw one bird aboard ship at lat. 2° 30' N, long. 91° 20' W on 13 April 1932. Since the individual was northward bound and such a short distance from the Galápagos, he assumed that it had come from the islands.

49. *Dolichonyx oryzivorus*.* Bobolink. Common. This passerine migrates regularly to the Galápagos. Specimens have been taken on Chatham, Charles, and James islands (Swarth, 1931:136) and also from Indefatigable Island (Bowman, 1960:30), all of which have moist grassy uplands attractive to this species. Alf Kastdalen, a farmer who lives about five miles north of Academy Bay, Indefatigable Island, has often seen individuals, more commonly groups of two to six birds, and occasionally flocks up to 20 birds, in clearings near his farm (fig. 6). Bobolinks have been seen as early as August by Kastdalen on Indefatigable Island. On 12 August 1957 Kastdalen presented Bowman with a partly decomposed female-plumaged bird (sex undetermined), which

was obtained in the highlands of Indefatigable Island the previous day. The specimen is preserved in alcohol in the Museum of Vertebrate Zoology. Greatest concentrations appear on the Kastdalen farm in October and November, and Kastdalen is of the opinion that Bobolinks are more common in the fall and spring than in the winter. Lévêque saw two birds on the Kastdalen farm 16 October 1961. Brosset took a female bird (no. G 77 of his collection) 21 November 1962, at Bella Vista, five miles north of Academy Bay, Indefatigable Island. In the southwestern sector of Indefatigable Island Miguel Castro observed Bobolinks as follows: one bird among Darwin Finches on 22 October 1964; a group of 10 birds, all female plumaged, on 27 October 1964, and one 11 November and 13 December 1964. Kramer (1965) recently captured an adult male Bobolink alive on Tower Island, on 25 July 1963. The bird was in worn breeding plumage and extremely thin. This specimen is now in the collection of the Alexander Koenig Museum, Bonn. On 15 October 1964 a Bobolink alighted on the sail of the Darwin Research Station vessel "Beagle II" as it lay in anchor at Punta Suarez, Hood Island. The bird was extremely tired, but attempts to trap it were unsuccessful (Castro, *in litt.*).

50. *Piranga rubra*.* Summer Tanager. Accidental. The mummified body of an adult male was discovered by Kramer (1965) at Punta Suarez, Hood Island, on 30 August 1963. Because of the fragmentary condition of the specimen, its race cannot be determined. Although this is the first record of a tanager in Galápagos, this species has already been reported on Clipperton and Guadalupe islands (see table 1), on the mainland of western Ecuador (Marchant, 1958:384) and in south-central Perú (AOU, 1957:545). It is of interest to note that *Piranga rubra* is the only tanager recorded in Europe (Arthur, 1963:49) and therefore capable of crossing vast expanses of ocean. A female-plumaged tanager of uncertain identity was seen by Miguel Castro (*in litt.*) 28 October 1964, in the farm country of southwestern Indefatigable Island. The bird was olive-green with dark wings, and, in contrast to resident passerines, was very wild. A second bird of similar appearance was noted in the same general area on 8 November 1964.

HYPOTHETICAL LIST OF SPECIES

Under this heading we include species reported in the Galápagos area, but not accepted by us, either because the original identification is subject to doubt or because actual occurrence in the prescribed area has not been verified.

1. *Diomedea* sp. Accidental. An albatross, larger than the Galápagos species (*D. irrorata*), with white mantle and scapulars and mottled coverts, was reported north of Abingdon Island on 17 July 1948, by Fleming (1950:176). He suggested that the bird might have been a Wandering Albatross (*D. exulans*), but the possibility that it was *D. epomophora* should not be excluded.

2. *Puffinus creatopus*. Pink-footed Shearwater. Accidental. Four individuals were seen by P. P. O. Harrison while aboard the "M. V. Cambridge" on 29 June 1959, at lat. 1° 15' N, long. 86° 15' W; and groups of 20 to 40 birds were seen by W. F. J. Mörzer Bruyns on 10 November 1955, flying southeast at lat. 7° N, long. 93° W (Bourne, *in litt.*), a location that is rather outside the limits of the Galápagos area.

3. *Puffinus griseus*. Sooty Shearwater. Accidental. A single member of this far-ranging species was seen (Lévêque) about 150 miles east of Chatham Island on 12 December 1960. In view of the fact that large numbers move into the northern hemisphere from both the New Zealand and Cape Horn regions (Phillips, 1963) and that it is at times common to abundant off Santa Elena peninsula in Ecuador (Marchant, 1958:359) and along the Peruvian coast (Murphy, 1936:667), it is somewhat surprising that the species has not been seen previously in the Galápagos area. However, Murphy (*in litt.*) says that shearwaters appear to move very rapidly over unsuitable tropical waters. In view of the possible confusion of *P. griseus* with *P. tenuirostris*, not only in the field but also with specimen in hand (cf. Eisenmann and Serventy, 1962:199), further documentation is needed before we include the former species in the Galápagos list.

4. *Puffinus carneipes*. Pale-footed Shearwater. Accidental. On 28 May 1961 and again on 12 March 1962 one bird was observed (Lévêque) about 240 miles east of Chatham Island. The plumage was entirely dark, the bill pinkish; unfortunately, the leg color could not be determined. No previous records of this species for the Galápagos area have come to our attention, and in

view of a possible confusion with *Puffinus pacificus* (cf. Alexander, 1959), definitive acceptance of *P. carneipes* in the Galápagos list must be deferred.

5. *Puffinus bulleri*. New Zealand Shearwater. Accidental. The only report to date is that of a sight record (*vide* Bourne) "just west of the Galapagos Is." (Palmer, 1962:173). We have learned from Bourne (*in litt.*) that this record is based on the observation of T. B. Scott who, on 11 June 1959, saw 20 birds at lat. 12° S, long. 105° W, which is well beyond the limits of the Galápagos area.

6. *Pterodroma inexpectata*. Scaled Petrel. Accidental. Reported as a straggler "w. of Galapagos" (Palmer, 1962:210). This report would appear to be based on the observation of P. P. O. Harrison, made on 6 September 1956, at lat. 6° S, long. 95° 15' W (Bourne, *in litt.*), which is beyond the limits of our presentation here.

7. *Pterodroma cooki*. Cook Petrel. Accidental. The Galápagos is included in the range of *P. c. orientalis* (Palmer, 1962:216), presumably on the basis of records off Perú, Baja California, and the Aleutians (Murphy, 1936:716).

8. Black petrel. Accidental. During various trips between Galápagos and the Ecuadorian mainland, Lévêque has observed large all-black fork-tailed petrels following the ship, sometimes for hours at a time. These birds were noted only during that half of the trip closest to the mainland. The records are as follows: in 1960, 12 or more in February, 5 in April, 1 in May, several in August, 8 or more in October; in 1961, 2 in February, 2 in April, 3 in May, 1 or more in July, 5 in October; in 1962, 6 in March. All these observations probably relate to *Loomelania melania*, but since no specimens have been procured within the limits of the Galápagos area as defined in this report, specific identification is uncertain. The Least Petrel (*Halocyptena microsoma*) also is to be looked for. But the Bulwer Petrel (*Bulweria bulwerii*) is probably only a remote possibility in the Galápagos area. (See Murphy, 1936:739.)

9. *Phaethon rubricauda*. Red-tailed Tropic-bird. Accidental. There are several sight records of this species just beyond the limits of the Galápagos area as follows: one seen by Falla on 28 February 1947, at lat. 1° 10' S, long. 100° 37' W, and several seen by Fleming (1950) on 27 November 1948, at approximately lat. 10° 30' S, long. 103° 20' W; one seen by P. P. O. Harrison on 4 September 1956, at lat. 1° 45' S, long. 89° 45' W, and two later the same day at lat. 2° 45' S, long. 91° W (Bourne, *in litt.*). If *P. rubricauda* is a likely migrant in the Galápagos area, then *P. lepturus* is not, and records of the latter species in the eastern Tropical Pacific probably relate to yellow-billed juveniles of *P. aethereus*.

10. *Sula leucogaster*. Brown Booby. Accidental. Although this species breeds along the Colombian coast and at nearby Cocos Island, Costa Rica, it can be included in the Galápagos list only on a very tentative basis. Fisher (Fisher and Wetmore, 1931:30) refers to "large numbers" of Brown Boobies at Tower Island (their party was in the Galápagos from 14 June to 26 August 1929). But this almost certainly represents a misidentification of the immature forms of *Sula dactylactra*, which are raised in large numbers here and are flying at that time of year. Fleming (1950:176) mentions the occurrence of *S. leucogaster* off Abingdon and Tower islands on 17 July 1948, but again a confusion with *S. dactylactra* or even *S. nebouxii* is probable (see also Murphy, 1936:860). The senior author became quite familiar with the three species of booby that breed in the Galápagos (*Sula sula*, *S. nebouxii*, and *S. dactylactra*) in all of their plumages, and on no occasion did he see a booby assignable to any but one of these species. Therefore, until a specimen is obtained in Galápagos waters, we must classify reports of *S. leucogaster* in the Galápagos area as questionable. In this connection it should be mentioned that there are also reports of *Sula variegata* (Peruvian Booby) in Galápagos, but all of these have proved to be in error, and based on misidentifications of *S. dactylactra* (see Murphy, 1936).

11. *Xema sabini*. Sabine Gull. Accidental. An adult of this species was reported by Worgan (Bourne, 1964:35) at lat. 01° 42' N, long. 86° 00' W on 22 November 1962; this location is at the easternmost limit of the Galápagos area. From the account of Mayaud (1961) it can be expected that birds moving from the Bering Sea to Perú would cross the Galápagos area, at least occasionally. Although there is a possibility of confusing *Xema sabini* with *Larus (Creagrus) furcatus* in the field, it should be pointed out that Worgan reported seeing the former with "positive identification" the day before he observed the latter (Bourne, *in litt.*).

12. *Larosterna inca*. Inca Tern. Accidental. The records by Harrison (1962 and *in litt.*) of this species, namely, one bird at lat. 4° 05' S, long. 92° 15' W on 4 January 1956, and two birds at lat. 8° 52' S, long. 98° 39' W on 13 March 1957, cannot be accepted until more definite evidence is obtained. Although Murphy (1936:1144) notes sporadic movements along the Peruvian and Chilean coasts, apparently (Murphy, *in litt.*) Inca Terns never go far offshore, and the species has never been found along the Ecuadorian and northern Peruvian coasts.

13. *Chordeiles* sp. Nighthawk. Accidental. On 22 and 23 November 1963 David Snow observed an individual "hawking" near Punta Suarez, Hood Island. On the evening of 24 November two birds were seen at close quarters. Since no sounds were uttered by these birds, species assignment (*i.e.*, *minor* or *acutipennis*) cannot be made with certainty (cf. Eisenmann, 1963:165), although Snow believes they were *C. minor*. This is the first record of a caprimulgid for the Galápagos and for any oceanic island in the eastern Tropical Pacific (see table 1). Yocom (1947:208) records *C. minor* far at sea off the Pacific coast of North America.

DISCUSSION

With the exception of the shore birds, migrants are extremely scarce in the Galápagos. The rarity of migrant land birds is even more striking when one compares the results of collecting and observing for a one-month period on Clipperton Island (Stager, 1964) with the results of years of field work by many experienced ornithologists in the Galápagos. Compared with wind systems and the position of the islands with respect to the direction of continental migration routes, distance from continents apparently plays a minor role in determining the number of migrants that ultimately reach even moderately remote oceanic islands. The Bermudas or the Azores in the North Atlantic are just as remote from the continents; yet the numbers of transient species recorded on them is greater than on the Galápagos. However, distance from continents may be very significant in the case of extremely remote oceanic islands such as the Hawaiian Islands. Migrant land birds are rarely found there, for the distances to be flown nonstop from continental land masses would be fatal to all but the strongest fliers, such as ducks and shore birds. A constant trickle of migratory land birds at sea off the Mexican and Central American coasts (see table 1) makes it all the more astonishing that there are, for example, no records of migrant warblers or even thrushes for the Galápagos.

Of the 63 species of Galápagos migrants listed above, only 50 are of certain identity, and these may be grouped as follows:

1. Petrel group. Some of these oceanic procellariiforms, *Daption capensis*, *Puffinus* spp., *Fregetta grallaria*, and possibly others, are typical breeders of the Antarctic and Subantarctic zones (cf. Murphy, 1936:71). In addition, *Puffinus pacificus*, *Procellaria parkinsoni*, *Pterodroma leucoptera*, and *Pelagodroma marina* are generally associated with the Subtropical or Tropical zones. All are known to make long-distance migrations. The occurrence of certain species of the petrel group on the Galápagos area might have been predicted on the basis of previous knowledge of their distribution elsewhere. However, we are woefully ignorant of the distribution of oceanic birds in the south Pacific, an area in which the avifauna is probably the least known in the world (Fleming, 1950). In general, migrant procellariiforms are rare in Galápagos waters, a fact that might be inversely correlated with the large populations of the six local species (see Swarth, 1931:33).

We may expect additions to the petrel group, particularly the southern elements crossing into the northern hemisphere and those associated with the Humboldt Current (cf. Murphy, 1936:99), or even those species, for example, *Oceanodroma* spp., characteristic of the California Current but which winter in tropical waters.

2. American mainland group. This heterogeneous assemblage consists of widely

TABLE 1

AVIAN MIGRANTS RECORDED IN THE GALÁPAGOS AND IN OTHER EASTERN TROPICAL PACIFIC ISLANDS

Species	Galápagos	Cocos	Malpelo	Clipperton	Revillagigedo	Guadalupe
<i>Anas discors</i>	×	×		×	×	
<i>Pandion haliaetus</i>	×	×		×	×	×
<i>Falco peregrinus</i>	×		×		×	
<i>Charadrius semipalmatus</i>	×				×	
<i>Squatarola squatarola</i>	×			×		
<i>Arenaria interpres</i>	×			×	×	
<i>Numenius phaeopus</i>	×			×	×	
<i>Actitis macularia</i>	×		×	×	×	
<i>Heteroscelus incanum</i>	×	×	×	×	×	×
<i>Catoptrophorus semipalmatus</i>	×				×	
<i>Erolia minutilla</i>	×				×	
<i>Ereunetes mauri</i>	×				×	
<i>Crocethia alba</i>	×				×	
<i>Steganopus tricolor</i>	×			×		
<i>Stercorarius pomarinus</i>	×	×				
<i>Megaceryle alcyon</i>	×	×			×	
<i>Hirundo rustica</i>	×		×		×	
<i>Piranga rubra</i>	×			×		×

Sources: Galápagos: present study. Cocos: Gifford, 1913, 1919; Murphy, 1958; Hertlein, 1963; AOU Check-list, 1957. Malpelo: Bond and de Schauensee, 1938; Murphy, *in lit.* Clipperton: Stager, 1964. Revillagigedo: Brattstrom and Howell, 1956. Guadalupe: Howell and Cade, 1954, 1956.

¹ A bird was seen by Bowman and Billeb along a stream inland from Chatham Bay on 8 March 1964.

distributed aquatic and terrestrial species from the American continents. These species are known to make long-distance migrations. The group includes *Podilymbus podiceps*, *Bubulcus ibis*, *Dendrocygna autumnalis*, *Anas discors*, *Pandion haliaetus*, *Falco peregrinus*, *Porphyryla martinica*, *Chordeiles* sp., *Megaceryle alcyon*, *Riparia riparia*, *Hirundo rustica*, *Petrochelidon pyrrhonota*, *Dolichonyx oryzivorus*, and *Piranga rubra*. Several of these species are known as migrants on other islands of the eastern Pacific (see table 1 and fig. 2).

3. Charadriiform group. Both in numbers of species and individuals this is the largest of the three groups of Galápagos migrants. The charadriiform group most clearly demonstrates the inverse relationship between the numbers of resident and migrant species. For example, there are only two resident shore birds, both moderately common (Black-necked Stilt and American Oystercatcher); but there are at least 23 species of migrant shore birds, and more will undoubtedly be reported, among them species reaching southern South America. As a group these migrants outnumber the residents. Indeed, the wintering population of Whimbrels or Tattlers alone is larger than the resident population of Stilts or Oystercatchers.

We know that there are four resident species of larids in Galápagos (Sooty and Fork-tailed gulls, Sooty and Noddy terns), all of which are common and in certain places abundant. Yet there is only one migrant larid (Franklin Gull) that can be considered a regular visitor; the other species are rare or accidental in the Galápagos.

It appears from these examples that wherever resident species have not fully occupied the local feeding niches, migrants have done so on a seasonal basis.

From the evidence now available it is clear that the Galápagos Islands are an important wintering ground or migratory way station for a considerable number of mainland shore birds. But there are other species such as the Blue-winged Teal and

Bobolink, and possibly also the Franklin Gull, that have a well-established migratory tradition in the Galápagos. It is difficult to judge the status of land birds, especially passerines (other than swallows), because they are so inconspicuous in the forested regions. This may be one reason why no migrant parulids have yet been reported from the Galápagos.

The status of the Bobolink is extraordinary. This eccentric icterid was first reported in the Galápagos by Charles Darwin, who obtained a specimen on James Island in October 1835. The species now appears to be most common in the Galápagos during the autumn, although Alf Kastdalen's observations indicate that it also occurs during the winter and spring. This fact has been established as a result of more than 25 years of regular observation in the highlands of Indefatigable Island. As grazing lands have been established within forested regions, the Bobolink has been quick to exploit these newly opened habitats, as is typical of the species in the northern periphery of its breeding range. One can only imagine how many birds might be accommodated in the poorly known highlands of Albemarle, the largest Galápagos island (fig. 1).

Students of geographical distribution are always eager to know more about the origin of migrants reaching remote islands. In the case of the Bobolink there is the intriguing possibility (suggested to the authors by the work of Hamilton, 1962) that some of the isolated breeding populations of western North America are making the Galápagos their wintering headquarters or a resting station along their migration route. If, indeed, the western North American population is a relict one, as suggested by Hamilton (1962:210), then perhaps it has a migratory history different than the rest of the Bobolink population, which is known to winter in southern Brazil and northern Argentina. But recently, Koepcke (1963:409) states that the species is present in large numbers around Lima, Perú. Thus Galápagos transients may very well contribute to that particular wintering population. It should be noted that the Galápagos Archipelago is almost on a straight-line course southeastward from California to the Peruvian coast.

All indications are that the Bobolink population of the Galápagos is small, possibly composed of no more than 100 or 200 individuals, which may approximate the size of the western breeding population in the United States. We can make only a very rough estimate of the size of these widely separated breeding units. Whether or not there is any close migratory relationship between the western North American and the Galápagos populations only future banding and trapping can establish. If the Bobolink originated on the mainland of South America, the Galápagos could be considered a secondary center of dispersal.

SUMMARY

Sixty-three species of migrant birds, of which 50 are of certain identity, are listed for the Galápagos area. Thirty-seven species are documented with specimens, and 17 are reported in the Galápagos area for the first time. The migrants fall conveniently into three groups.

The petrel group is represented by eight species, all of which are known for their long-distance migrations. The scarcity of migrant procellariiforms in Galápagos waters may be inversely correlated with the relative abundance of the six local species.

The American mainland group is a heterogeneous group of widely distributed aquatic and terrestrial species that are distinguished by long-distance migrations.

The charadriiform group is the largest of the three assemblages, both in numbers

of species and individuals. This group clearly demonstrates the inverse relationship between the numbers of resident and migrant species. There are only two species of resident shore birds, but there are at least 23 migrant species. There are four resident species of larids, all common and in places abundant, but only the Franklin Gull is a regular migrant visitor.

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