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A REVIEW OF THE ORNITHOLOGY OF THE GALAPAGOS ISLANDS.

WITH NOTES ON THE WEBSTER-HARRIS EXPEDITION.

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(Plates V. and VI.)

I.

INTRODUCTORY NOTES.

TOWARDS the end of 1896 one of us—Mr. Rothschild—suggested to Mr. Frank B. Webster, of Hyde Park, Massachusetts, that he should send out an expedition to the Galapagos Islands, to collect natural history specimens. The great interest attached to the fauna of the Galapagos Islands since Darwin's explorations became still more intense through the most successful recent explorations of Messrs. Baur & Adams. The bulk of the collections made by these two gentlemen was purchased from the late Dr. Baur, and is now in the Tring Museum. Their study made the desire for more material more ardent.

Mr. Webster was much interested in the proposed scheme, and he arranged an expedition in March 1897, under the command of Mr. Charles Miller Harris as chief naturalist and Mr. S. A. Robinson as sailing master, Messrs. James Cornell, O. E. Bullock, and George Nelson as collectors. The party went to Colon, where they intended to charter a suitable vessel. Here poor Robinson, Cornell, and Bullock contracted yellow fever and died, partly at Colon, partly on their voyage home; and Nelson, on reaching San Francisco, refused to go on and returned home. Mr. Harris, however, did not despair. He was able, after some delay, to charter the two-masted schooner *Lila and Mattie*, and left San Francisco, accompanied by Messrs. R. H. Beck, F. P. Drowne, and C. D. Hull as collectors. The gross tonnage of the vessel was 105·76, the length 93 feet. The crew, including the captain, consisted of five persons. Besides a yawl-boat with sail belonging to the vessel, an 18-feet-long, flat-bottomed, high-nosed skiff, was taken for landing in surf.

The unfortunate delay caused by the deplorable fate of Messrs. Robinson, Bullock, and Cornell, was much to be regretted in several ways. The original intention to make extensive collections on Guadalupe, several islands of the Revilla Gigedo group, on Cocos and Malpelo Islands opposite the coast of Colombia, and to visit the unknown and doubtful islands of Duncan and Gallego, between the Revilla Gigedo group and the Galapagos Islands, had to be abandoned, and only a short stay could be made on Clarion Island, the most western island of the Revilla Gigedo group, while Cocos Island, the exploration of which was considered specially

important, could not be visited at all, on account of the equatorial calms approaching, which would have made impossible the return of the vessel for a considerable time. It is also, probably, due to this delay that no nests and eggs of any of the land-birds were found; several of the islands could not be visited as long as had originally been intended, and the desired research for remains of dead tortoises could not be made to the extent which would have been useful.

Notwithstanding, however, these shortcomings, Mr. Harris' party, which returned to San Franciso in February 1898, collected on the whole very successfully. The material of birdskins and land tortoises is evidently by far the largest and best ever amassed on the Galapagos Islands. The following article will show the result of our study of the birds. In the arrangement of the species we have followed the most important article of Mr. Ridgway, for the convenience of those who may wish to compare our notes with his. We have not given detailed descriptions of all the species, this having been done by Ridgway; and of synonyms and of literature we have only quoted those referring to species or occurrences on the Galapagos Islands, and a few more important quotations.

Before our article we have printed the two separate diaries of Messrs. Harris and Drowne, and have incorporated some interesting and characteristic reproductions of original photographs and pen-and-ink drawings by Drowne.

II.

DIARY OF CHARLES MILLER HARRIS.

June 21, 1897.—We left San Francisco. A southerly wind took us out to the Farralones. At about 4 p.m. the wind died out, and at dark we were drifting about north of the Islands. Four big California whales were seen sporting about the vessel.

June 22.—Laid by the islands all night, as there has been no wind. Murre, western gull and albatross very plentiful. I have been unpacking and arranging workshop all day. This afternoon we have been getting down the coast three or four knots per hour.

June 23.—Breeze freshened during the night, and to-day we are off Pigeon Point. Worked unpacking and cleaning guns. Saw a large hump-back whale covered with barnacles. At 4 p.m. we were off Point Sur, one hundred miles south of San Francisco. Nine-knot breeze at bedtime.

June 24.—Fresh breeze this morning. Found out that condensed milk had been left out of order. At 5 p.m. log registered 316 knots. Hull and Beck helping out on watch.

June 25.—Fair winds still. Spoke American three-mast schooner *Challenger*, bound for San Francisco, and asked her to report us. Saw some small petrels, probably "Least Petrels." At 7 p.m. log 529 knots.

June 26.—Coming on deck at 6.30 found that we were in sight of Guadalupe Island. During the night a flying fish came aboard, 16 in. length, 16 in. spread. At noon log 676 knots.

June 27.—Still fair wind. At noon log 872 knots. Albatross and petrels still with us. Saw several birds, either terns or jaegers. At noon passed through quantities of Spanish sail fish.

June 28.—This morning small bunches of barnacles floated by; the water was full of them. At noon 1045 knots. Wind dying out.

June 29.—Calm this morning. No wind. No birds. At noon 1127 knots. Making plans to work Clarion Island.

June 30.—Still light winds. Making 2 or 3 knots an hour. At noon 1187 knots. Saw tropic bird, flying fish, Spanish mackerel.

July 1.—This morning Beck killed two tropic birds (*Phaethon rubricauda*) and two shearwaters.* At noon 1258 knots. Towards evening Hull shot a tropic bird and I shot two red-footed boobies.

July 2.—To-day we killed several red-footed and blue-faced boobies,† and frigate birds, and one tropic bird. Noon 1344 knots. Breeze freshened towards night. Sighted Clarion Island at 3 p.m. At dusk laid to about fifteen miles to the windward of the island, preparing to land in the morning.

July 3 and 4.—Owing to strong current and some wind we drifted to leeward of the island. About 10.30 we anchored in Sulphur Bay, and landed at once. As we approached the island the boobies and frigate birds began to come and alight on the vessel, sometimes fifteen or twenty at a time; while at times five hundred or so would circle around. In all the trip we did not find birds so fearless! We could see on the sides of the island great patches of the birds (colonies). Found blue-faced boobies breeding in numbers. They make a small hollow in ground, laying one and two eggs, generally two—in no case were more than two found. Red-footed boobies we found breeding by thousands.‡ They make a shallow nest of sticks, occasionally a little grass and a few feathers; the **nest is placed in the bushes** from 3 to 15 feet from the ground. Number of eggs in **no case exceeding one!** There were young birds in all sizes, from just hatched to fully developed, and eggs from fresh to advanced.

On this island we only saw two red-footed boobies in a grey plumage, which we got; all the others, old and young, were white. (Later it will be noted that at Tower Island the **majority were in grey plumage.**) On this island the birds built their nests in compact colonies, while on Tower Island they were spread all over the island. Several species of butterflies, grasshoppers, and a sphinx moth were observed. Some eighteen or twenty snakes were captured. When taken they appeared to vary much in colour, some being brownish, some blackish, and some greenish. Small wren § abundant; some old nests found. Oval, entrance on side, near top, sort of roofed over; nest placed in crotch or on limb.

Ravens were fairly abundant, but very shy. Some were shot, but the plumage was so poor that we did not save them. They evidently were breeding, as young birds were shot. Ground owl were abundant.‖ Doves were also plentiful.

Observed two kinds of lizards: one a light grass-green—one of the most lively and pretty lizards I ever saw; the other a light brown with stripes; both kinds collected. Several red land crabs were taken on the tops of the hills. Salt-water crabs were abundant along the shores. Saw a small Octopus, arms about 20 in. It went under a big rock; we poked a pole at it, and it took hold and held on with great strength.

Small sharks were abundant in the shallow water of bay. The mate harpooned a 150-lb. green turtle, which was very good eating. There is a small tree-like bush on this island, that when wounded bleeds a milk-like matter very freely. The cactus, like the prickly pear-cactus of California, very abundant. It is very

* *Puffinus auricularis* and *Aestrelata heraldica.*
† *Sula cyanops.*
‡ This is *Sula piscatrix websteri* Rothsch. See p. 177.
§ *Troglodytes tanneri.*
‖ *Speotyto cunicularia rostrata.*
¶ *Zenaidura clarionensis.*

difficult to get through these plants. A wild morning-glory is abundant on island. Along the beach are coral rocks, and many pieces of coral washed up and worn.

The bushes on which the boobies build have thorns say 2 in. All through them are the remains of boobies that have been caught and perished. We killed all the boobies required with sticks.

Completed, and returned to vessel at noon of 4th. Had a special dinner for the occasion. Hoisted anchor about 3 p.m., and stood south. Had some fireworks in the evening.

We did not work the island completely, only the section of Sulphur Bay. Would have liked to complete it, but did not feel justified in delaying.

July 5.—Fair breeze last night, calm at evening. All hands attended to specimens.

July 6.—Calm. All working. Sharp showers in afternoon and evening. Sailor captured a red-footed booby on bowsprit at dusk.

July 7.—Still calm. Finished the skinning of the boobies.

July 8.—Blew booby eggs.

Red-footed : Small eggs 1.42×1.16 to 2.10×1.50 inches.
Average size, 2.50×1.55 to 2.45×1.60 inches.
Large, 2.60×1.56 inches.
Blue-faced booby eggs :
Average, 2.70×1.75 ; 2.50×1.75 ; 2.60×1.70.

July 9.—Sailing south slowly, none of us feeling well on account of hot weather.

July 10.—Calm nearly all day. Rain squall in afternoon.

July 11.—Heavy swell and showers.

July 12.—Fresh S.W. wind all day. Making from 4 to 7 knots. Saw a booby with blue neck.

July 13.—About 4-knot breeze all day. Saw albatross first with white colour ; all others seen were grey, to date.

July 14.—Fair breeze all day.

July 15.—Showers and S.W. wind. Filling empty barrels with rain-water. Saw schools of porpoise.

July 16.—Showers in morning, in afternoon ran into S.E. wind and heavy sea. At 9 p.m. a squall carried away mainsail halyard, and mainsail had to be bent for night. Vessel making 4 knots per hour under foresail and jib.

July 17.—Rigging repaired, and at 9 a.m. main sail reefed and set to the wind. Large school of porpoise under our bows.

July 18.—Wind fresh and course favourable. Have struck the S.E. trade winds.

July 19.—Fine wind; making about 145 knots per day now.

July 20.—Saw a large turtle this morning, also three porpoises. Saw three petrels ; they looked large and black, showing no white. If wind holds shall be at Culpepper Island on Sunday.

July 21.—Made a good run, 167 knots in twenty-four hours. Saw a very dark booby.

July 22.—Still fair wind. Weather cool and everything lovely. All feeling well. Struck with harpoon two porpoise, but failed to land them.

July 23.—Wind and weather still good. Packed the Clarion Island birds. Painting boxes inside with carbolic acid.

July 24.—Quite cool this morning ; birds becoming quite abundant, indicating approach to Culpepper Island. Should be off the island to-night.

July 25.—Cloudy this morning, and no island in sight. Quantities of birds indicate our nearness to island. Birds seen : Gulls, terns, petrels, shearwaters, turnstone, man o' war, booby. A flycatcher came aboard, and I caught it with a net (*Myiarchus magnirostris*). The island was sighted by Captain Lenbridge at 3.35 p.m., fifteen miles N.E. After supper we drew near very rapidly. Found it very abrupt. The north side looks like an immense wall of masonry, each layer of rock six feet thick ; on west side is a peculiar dome-shaped rock ; on east side is a reef terminating with an arched rock of considerable height. There are apparently bushes and cactus on top of island.

Thousands of above-mentioned birds are circling about the island ; their cries are literally deafening ! The rocks are whitened and streaked with the excrements of the birds. We will lay by the island all night if there is no anchorage. Birds are very tame. Every one is well, and impatient to begin work.

July 26.—Last night drifted to the southward of Wenman Island, and at daylight the Captain headed for it, thinking it was Culpepper.

We reached **Culpepper** at 8.30.

Hull and myself went ashore. Found marine iguanas abundant. Frigate-birds breeding (one egg collected). *Puffinus subalaris* was breeding (eggs collected). This bird lays one white egg, and nests in little holes under rocks and in the cliffs ; and it also seems to take pains to seclude. The birds are very tame, allowing one to take them from the nest with one's hands. The *Anous galapagoensis* lays a very prettily spotted egg, and nests in similar places, but more openly. Occasional sticks and feathers in the nest. *Creagrus furcatus* was breeding. We found no nest, but took a misplaced egg. No doubt plenty were on the top of the island.

Killed one *Procellaria*. Red-footed * and blue-faced † boobies both breeding. Ground doves very abundant and excessively tame. Mocking birds (*Nesomimus*) and *Dendroica* abundant. Two or three species of *Geospiza* observed and taken. Shot a turnstone. Hull shot a cub fur seal. More seen. Two species of crabs seen. Put up twenty-five skins after returning to vessel at 2 o'clock.

July 27.—This morning all hands at work ; put up twenty-seven skins and the cub seal. In the afternoon all went ashore and worked on the east edge of the island. It is the only part of the island that can be worked. I killed a large brown hair seal, but from lack of time did not save it. Beck and Drowne killed a number of birds, among them two beautiful tropic birds (*Phaëthon aethereus*). Took eggs of frigate bird, tern and shearwater. The black-capped tern‡ is extremely abundant at this island. There are thousands of them, and they appear to be breeding on the top of the island. We did not observe them outside of thirty miles from the island. No chance whatever of reaching the top of the island. The frigate birds are very bold, one swooping down and pulling off Beck's cap.

July 28.—All hands put up fifty skins to-day.

July 29.—All ashore collecting to-day, returning about 3.30. Put up twelve skins. Intend to leave for Wenman with first wind. Calm now.

The formation of Culpepper Island is volcanic rock and sandstone. Vegetation, several species of vines, bushes, and cactus. Fur seal ; 2 taken. Hair seal ; 2 shot, not saved. Reptiles, iguanas ; 2 taken, put in alcohol. Of insects we saw flies like the common house fly. There were several beetles taken from stomach of dove, but

* *Sula piscatrix websteri.* † *Sula variegata.* ‡ *Sterna fuliginosa.*

unfortunately they were lost. Two species of crab; 5 taken and put in alcohol. Fish very abundant about the island. One very *bright gold fish, like gold leaf*, say 8 to 12 lb. in weight. It was cool and comfortable during all our stay. There seemed to be a number of fur seals about the reef and arched rock. (We only observed fur seal at Culpepper and Wenman—more plentiful at Wenman.)

July 30.—Worked putting up skins and blowing eggs.

July 31.—The morning found us close to **Wenman** Island.

After breakfast we went ashore. The island is a portion of a crater—with one side gone. Most of the middle and large island is a high sharp ridge, inaccessible; but one end flattens out in two directions, having a flat top, over which we collected. There is a big rock on one end of the main island, and off the other is a small round flat island. We returned to the vessel about 3, and put up 58 skins by 8 o'clock. Beck secured a heron and several *Creagrus* eggs. The black-capped tern—so plentiful at Culpepper—is only a straggler here. The male frigate bird sits on the edge of nest and distends its pouch like a child's toy rubber balloon; if you frighten it off it goes with pouch distended. We could see them from the vessel sailing around, with the bright scarlet pouches showing to advantage. The frigate birds we found to lay only one egg, breeding both on ground and on bushes, seeming to prefer the latter; nest 2 to 8 feet from ground.

Aug. 1.—To-day I took the mate and one sailor, and went after fur seal, securing several. They were found lying in caves among the rocks, and were shot or clubbed on being aroused. We caught one small one. This appeared to be say 3 or 4 weeks old.

Aug. 2.—Expected to work the island to-day, but we are five miles off and drifting away. Calm.

Aug. 3.—Still calm, and cannot get to the island in the afternoon. Put out boat, and boys picked up petrels and tern.

Aug. 4.—All hands worked the island to-day, securing sixty birds, eggs, shells, etc., also one centipede. We returned to the vessel about 3 p.m., and put up our stuff. Vessel headed for Abingdon with a passable wind. We took one specimen of large *Geospiza*—possibly *magnirostris.** This was the only one seen on the island. Presumably the *Certhidea* and *Geospiza* are new species, and the black-capped tern is new to the islands. This refers to both Culpepper and Wenman.

Wenman Island consists principally of volcanic rock and some sandstone. The island consists properly of three islands. These are a steep inaccessible rock; the large main island, part of which can be worked; and a low, flat island, which has been gone over. Vegetation: cactus bushes, vines, and a white morning glory. Mammals: fur seal, brown hair seal; a cub seen was cream colour, with blackish spots. Iguanas, turtles, centipedes, and house flies. Three or four kinds of water crabs. Shells and urchins abundant. Many species of bright fish. One specimen of frigate bird, thirty-six of which were taken here, was very peculiarly coloured. Feet madder red; gular sac, eyelids and bare space indigo; bill horn; iris dark brown: this colouring being entirely different from any others.

The *Creagrus* makes its nest by gathering chips of lava and piling them around, leaving a hollow. I noticed the feet of the blue-faced booby have a more greenish or bluish cast than those from Clarion Island.† Face and gular sac darker. In other words, the flesh parts are a darker colour than on those from Clarion. I secured one

* *G. strenua.* See p. 155.

† Those from Clarion Island were true *Sula cyanops*, those here *Sula variegata*.

young *Butorides* ; no adults seen. A few black-capped tern taken off the island—not resident. Bird life not as abundant on Wenman as on Culpepper. I noticed that the *Geospiza* are carrion-feeding birds, eating from dead carcases of seal ; also observed them feeding on vermin on the boobies, standing on the feet and backs of the boobies for that purpose. Many old nests of *Geospiza* and mocking birds were seen, but none found breeding.

Aug. 5.—Worked all day on skins, eggs, turtle. Abingdon Island not sighted. Have been heading S.E., but current drifting us N.

Aug. 6.—Calm all day. Have drifted N.W. to a position E. of N. of Culpepper at noon.

Aug. 7.—Foggy all day. No observation. Probably S.W. of Culpepper, as we have been heading that way.

Aug. 8.—Still calm and foggy. We are somewhat N.W. of N. Albemarle, in long. 93 or 94.

Aug. 9.—Made some S. and E. to-day. Saw some flocks of turnstone.

Aug. 10.—A good wind from 12 m. to 5 p.m. brings us in sight of N. Albemarle. It is very high land. Wind dies out about 11, and we drift N. again.

Aug. 11.—Calm during the morning. Albemarle in sight part of the time. A light wind during afternoon and night ; if it continues bids fair to bring us to Abingdon by morning. Saw a large bird, dark, with spread of 4 or 5 feet, flight like an albatross. (Note.—We saw nothing like it afterwards.)

Aug. 12.—**Abingdon** in sight on getting up in the morning, 12 to 15 miles away. Arrived off the west side of the island about 11.30. As soon as dinner was over, the mate took a boat and made soundings, and at 4 p.m. we anchored in 8 fathoms, $1\frac{1}{2}$ mile north of Cape Chalmers. Bottom coarse sand and rock. Hair seal very tame. Several turtle seen. I shot a pelican with a rifle as it flew by.

Aug. 13.—Abingdon Island. All hands started at 6.30 in the small boat, and landed north of vessel. I instructed each man to collect about twenty birds, and be back at the boat at 11. Drowne failed to show up. Search was instituted, and at about 3 p.m. he was found by me on opposite side of island. He was well exhausted and scratched. He had got lost, and lost his head.

Aug. 14.—Drowne's escapade yesterday knocked us out a whole day. We had to put up yesterday's birds, saving about seventy.

Aug. 15.—In the morning all went ashore. Hull and Drowne gathered urchins and shells, while I collected about fifteen birds. In the afternoon took care of the birds.

Aug. 16.—Beck, Hull, and myself collected on south end of the island, landing at Cape Chalmers. Very rough climbing about, and birds not as plentiful as on the north end. Drowne cleaned shells, etc., while we were going. Put up birds in the afternoon. Deserted nests of small birds very plentiful on south end. I note a number of trees have been cut down on the south end, probably by people from vessels.

Aug. 17.—Again collected on the north end, and in the afternoon put up our birds.

Aug. 18.—In morning collected the north end. At 2 p.m. hoisted anchor and sailed for Bindloe. Good wind. Put up sixty-five birds in the afternoon.

The north end of Abingdon is bare lava, the south end covered with vegetation as follows : A wild cotton bush, bearing a beautiful yellow flower ; a tree cactus, with smooth trunk, some 2 ft. through, some 15 ft. high. The *Geospiza* pick holes

in the leaves while feeding, and the sap and dew which fall at night accumulate and evidently furnish water for them. A white-barked tree, often 20 ft. high, resembling an apple tree, exuding a yellow pitch ; thorn bushes ; grass and vines. Hair seal, reptiles, iguanas, turtles, and two species of lizards. Insects : house flies, grasshoppers, and several butterflies.* Perhaps a dozen butterflies seen on the wing ; many brilliant fish ; three species of sea crabs. *Buteo*, common and breeding ; one nest found in cactus, 10 ft. from ground ; nest of sticks lined with grass very substantial, containing one fresh egg, white with slight greenish tint. *Geospiza*, about five species taken. The number of each *Geospiza* collected fairly representing their relative numbers on the island.

No water found. Do not think tortoise exist here ; we could find no signs. **Black** *males* of *Geospiza strenua* fairly common. More birds exist on southern slope than on northern parts.

Aug. 19.—Worked on birds, etc. Arrived off Bindloe at 4 p.m., but wind died out and could not anchor. The island seems to be mostly bare lava. Gloomy and forbidding. Patches of brush and trees show up in places.

Aug. 20.—Good wind all night, and this morning early we were off the north end of the island. Spent the day cruising about looking for an anchorage. One day lost by the hesitancy of the captain. About 4.30 dropped anchor in about 11 fathoms at place marked 15 fathoms on chart (farther in). We landed for a few minutes in the evening.

Aug. 21.—**Bindloe.** All hands went ashore early collecting ; got a fair lot of birds. Beck went to the interior of the island, but got nothing different from what we got on the coast.

Aug. 22.—Hull and I took a long tramp to-day, wrapping our feet and legs in canvas for crossing lava. We went to the top of the island, and visited a number of patches of brush looking for birds. I secured one *male Pyrocephalus*. One young *male* taken, but no *female*. The bird is here certainly very rare, as the two noted were the only ones seen by the party. *Geospiza crassirostris* are very rare. The island is an immense lava bed, crowned with a few hills covered with vegetation, and a few small patches of brush on some side hills. Bird life is not plentiful on Bindloe Island.

Aug. 23.—All went ashore early and collected till 10 a.m., when we came aboard and weighed anchor, sailing for Tower Island with a strong southerly wind. I have been sick all day, not working after getting aboard.

Aug. 24.—I have been feeling unwell all day. At 2 p.m. we tacked ship within 10 miles of Bindloe, having been sailing 26 hours with a strong wind, and not gained an inch. Steering E. by S. and S.S.E. ; current and sea setting us to N.E.

Aug. 25.—At noon to-day our position was about 50 miles N.E. of Tower, with no immediate prospects of getting there.

Aug. 26.—At noon to-day 46 miles N.E. of Tower, and everybody "out of sorts."

Aug. 27.—At 12 noon, lat. 51°, long. 88°. No cactus was observed on Bindloe, but on a beach was found a vine growing, bearing a pod like a pea, and with a flower like a purple sweet pea. Hair seal and iguanas were plentiful. We also saw dragon-flies and grasshoppers. Several species of bunch-grass grow on the island.

Aug. 28.—At noon we found our location to be 25 miles S.E. of Tower, having had a southerly wind during the night and morning. We decided to skip

* *Dione* spec.

Tower for the present and make Indefatigable, having a favourable wind to proceed south. In the evening light from a volcano showed very brightly from the direction of James Island.

Aug. 29.—This morning, on getting up at 6.30, found that we were becalmed in the passage between James and Indefatigable, just off Daphne Islands, about 10 miles from Conway Bay. During the day we managed to beat up to the bay, and dropped anchor in 5 fathoms under the Lea of Eden Island. Indefatigable Island slopes gently to the summit, and is thickly covered with vegetation. We can see from the vessel what looks like mangrove trees along the shore ; also very tall cactus. The volcano on James is very active, and this evening made a grand sight to watch.* Conway Bay is a fine harbour.

Aug. 30.—This morning all hands went ashore on **Indefatigable,** and collected, 69 birds being the result. Birds very plentiful and tame.

Aug. 31.—All hands collected to-day ; saved 54 birds. Beck secured two large turtle. Drowne reports seeing a **cuckoo.** Shot at it, but failed to secure it. I secured a small wood rat. Saw two more, but could not get them. Got eight or ten very large crawfish, making a nice supper.

Sept. 1.—All hands collected this morning. Beck got two more rats ; Drowne another turtle. I got three ducks and two rails. Saw and shot at a cuckoo. The cuckoos were very shy. Bills of ducks are **plumbeous blue,** not black, as Ridgway states in his book. Saved 54 birds. Beck killed twenty odd birds with stones. I secured a *Geospiza* with a few white feathers on the head.

Sept. 2.—All hands collected to-day. Yesterday Hull secured an egg of the *Buteo* ; it was well incubated, which would seem to indicate that the hawks lay but one egg. The mate found a nest of the blue heron with three fresh eggs, but broke one in getting them.

Sept. 3.—To-day we took the yawl-boat, and sailed north along the coast of Indefatigable, about nine miles, making a landing at 11 a.m., and staying till 2 p.m. Took a set of pelican eggs ; nest in mangroves. If we had a naphtha launch we could have collected all this locality and several islands, and vessel remained at Conway Bay, saving hours daily and severe labour. One of the sailors reports seeing a small snake. Grasshoppers, iguanas, lizards, and a few small butterflies seen.

Sept. 4.—Weighed anchor this morning, and sailed for **Duncan,** arriving at noon, but could find no anchorage. I took a short trip on the island, and could find no suitable camping place, so have got to lay to.

Sept. 5.—Hull, Drowne and I landed about 7.30 this morning, intending to shoot birds. About 11 we got into an immense crater, about half a mile across, full of vegetation. I had not been in this long before I discovered a tortoise. Calling the other boys, we secured it, and searched for more. We found seven in the course of the afternoon, turning them on their backs and weighting them with heavy rocks, as we thought sufficiently. Got back to vessel after dark very tired, leaving tortoise to be got on Tuesday. The captain against my wish ran back to Conway Bay.

Sept. 6.—Put up about seventy birds to-day ; loaded cartridges, made turtle skins, etc. Heavy swell from south. We are going to bring down the tortoise to-morrow. It will be almost killing work, but it must be done.

Sept. 7.—All hands landed on the east side of the island, leaving our lunch at the boat, expecting to be back at noon with three tortoise. On getting to the

* See line 3 above, and pp. 95 and 114. The volcanoes are supposed to be inactive !—Ed.

crater we found one big tortoise dead, one of the big rocks that we had weighted it with having fallen on its head and shut its wind off. Several of the others had got loose, but all were found ; also a smaller one. At noon we had just got the tortoise secured, and were two miles from lunch, and our water was short. Knowing that we should be obliged to take our tortoise down to the west coast of the island, we decided to let dinner go. Two men each took a tortoise lashed to a pole, and started for the coast. It was the hardest work that I ever did for my part, and I guess that the rest thought the same. At 4 we got to shore above a high bluff. We tied them here for the night, and started for the boat, two miles across the island. This was very rough work. No dinner ! No water ! The sailor Charles was completely exhausted after reaching the boat. Got to the vessel at dark. Beck secured a rat.

Sept. 8.—To-day we landed on the west side of the island, leaving the sailor Herman to watch the boat. Got to the crater fairly easy. Found the tortoises all right, except the smallest one, which was practically dead. Rats had gnawed a piece out of one hind foot. They had also gnawed the eye of the large dead tortoise. The mate brought down one tortoise alone ; the rest of us two more. Got to shore about 2.30. Lowered tortoise over the cliff with ropes, 60 to 75 ft., reaching the vessel about 6.30 with six live tortoises. Got two penguins. Rats appear numerous.

Sept. 9.—Wind light this morning. Had a hard pull to the island. Drowne, the mate, and a sailor detailed to bring down two dead tortoise. Hull, Beck, and myself were to collect. I found a tortoise which I sent down by the mate in place of a dead one. Sent Beck to explore a little valley at and above the head of the crater. He returned with a small tortoise, and said that he had seen five more big ones. Taking one live and one dead tortoise, and a bag of remains, we started for the boat, getting there about 4.15. Got about 75 birds. I decided, since we were all very tired and had considerable work to do, to go to Conway Bay and anchor till Monday morning, when we would return and secure the balance of the tortoises.

Sept. 10.—Put up about 75 birds.

Sept. 11.—Prepared tortoise and turtle.

Sept. 12.—This has been a day of rest. Rowed over to Duncan Island and Eden Island in the morning. Some of the tortoise have eaten and drank. Black *males* of small *Geospiza* quite common on Duncan.

Sept. 13.—Landed on the weather side of Duncan about 9.30 a.m. The mate, a sailor and Drowne brought out one live tortoise and bag of remains. Hull, Beck, and I found and tied up six more. They are in an extremely hard place to get at. Worth 25 fr. a day to get them out, for each man—what all the party say each night. Will anchor in Conway Bay to-night.

Sept. 14.—Landed on lee side of the island quite early. Have decided to let Hull and Beck camp ashore for a few days, so we packed camp outfit to the top of the island, pitching tent, etc. ; found six more tortoise; carried two large ones part way to the shore. Will anchor at Conway Bay to-night. I am going to let the mate and Drowne go ashore and camp and help work out tortoise. Do not feel well myself, and shall stay with vessel. Mate taking my place.

Sept. 15.—Made up the camp duffel and landed the mate and Drowne on Duncan about 9.30. The wind was light this morning, and we were a long time sailing over from Conway Bay. Will call for them Saturday afternoon, returning with the vessel to Conway Bay.

Sept. 16.—Laid about the vessel all day. The captain has been scraping

barnacle from the bottom of the vessel. This evening the volcano on James has been very active.

Sept. 17.—This morning went ashore in the yawl boat. Got some cactus for the tortoise to eat. Shot two ducks for dinner. Captain finished his job of cleaning the vessel.

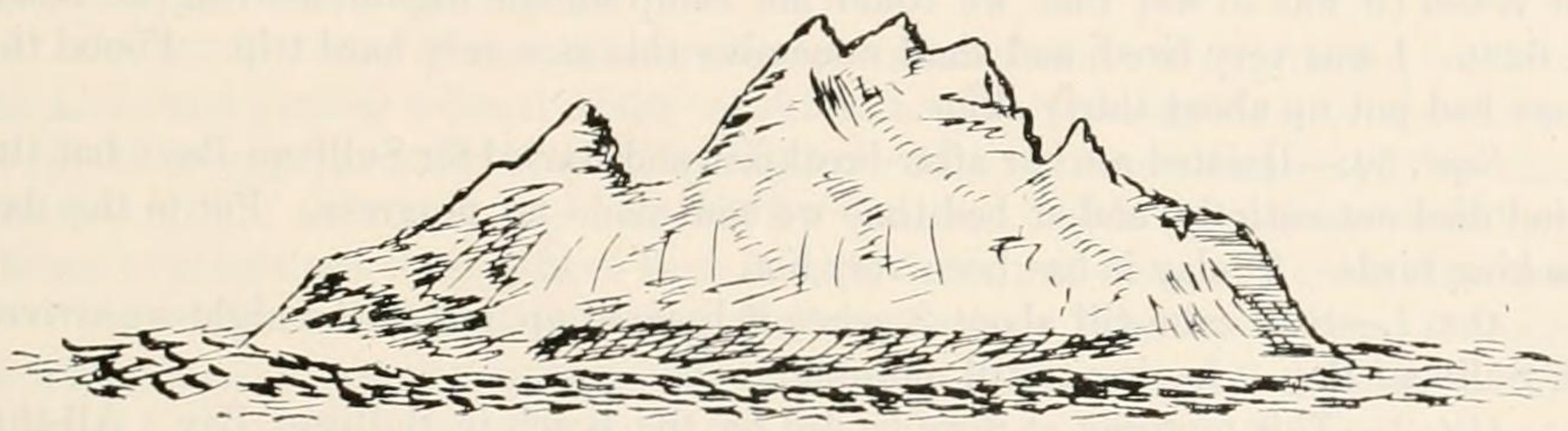
Sept. 18.—After dinner hoisted anchor and stood over to Duncan. The boys came off to the vessel about 3.30, bringing seven tortoise. They have eleven more tied up on the island. It will take them till Thursday night to get them aboard. Beck brought three rats, which he caught in traps. The boys say that owls kept them awake in the night with their screeching about camp.

Sept. 19.—Sunday ; resting up.

Sept. 20.—This morning at 5.30 were under way for Duncan. Landed the boys about 8. They will camp on shore this time. Have been fixing tortoise pens to-day. The volcano is on a rampage to-night. (See pp. 93 and 114.)

Sept. 21 and 22.—Have rested. Tortoise eating and drinking well.

Sept. 23.—Weighed anchor after breakfast and sailed over to Duncan. We found on Duncan Island the trails of the tortoise from cactus to cactus—which they had travelled in their trips for food and water. In places where they had climbed



JERVIS ISLAND.

up on the rocks to get at water that had collected they had worn the rock smooth in places, cutting it several inches deep by continued wear, in the centre of crater where at times the water had settled and killed vegetation. It could be seen where the tortoise had gone in and wallowed about, the same as the American bison do. The tortoise were seen eating cactus, leaves from trees, grass, vines, and lichens on the brush. The boat came out with six tortoise about one o'clock, returning after the other five. On return of boat to the vessel headed for Jervis Island. Boys brought some crabs, bats, iguanas, lizards, and one centipede. Anchored in fifteen fathoms off Sand Beach, 5.45 p.m., at **Jervis Island.**

Sept. 24.—All hands collected on **Jervis Island**. We went over it thoroughly. Jervis is far the easiest to get about on. There is a small salt lagoon at the back.

Sept. 25.—Put up 105 birds to-day. Will sail for James Bay in the morning. Crew have been changing things over in hold, making room for the tortoise. Saw a large whale close to the vessel.

Sept. 26.—Began getting under way after breakfast. Had a hard pull getting in anchor. Arrived at James Bay 1.30. Anchored in seven fathoms. About 2.30 put out a boat and went to a place marked on the chart "a small run of fresh water." Found streams all dried up except a little place where a pint of water could be got a day. Found the skeleton of a man in a little cave on the side of a hill

Not finding water here will oblige us to slight James Island somewhat, I am afraid.

Sept. 27.—All hands landed early and collected till 11 a.m. I got a fine flamingo in lagoon. First seen. One of the lagoons is full of salt, and is evidently used by Mr. Cobos and vessels for obtaining salt. Signs of donkeys and pigs are abundant, but they must be in the high interior, where they can get water. Worked all the afternoon putting up birds.

Sept. 28.—All hands collected this morning and put up birds in afternoon. Got a load of cactus for tortoise. Trees larger here than any that we have seen thus far. The black *males* of *Camarhynchi* were more common here than on other islands visited. Beck and I shall be going into the centre of the island to-morrow.

Sept. 29.—This morning at five Beck and myself started for the interior of the island, leaving Hull and Drowne to collect and put up what birds they could. After a very hard walk, at noon we found ourselves on the top of the island. The vegetation is tropical in appearance, and if it were not for striking a pig-trail we could not have got in at all. We saw a number of hogs, and Beck shot a small pig. We also saw two very fine donkeys. Dark *Geospiza strenua* and *Pyrocephalus*, very common, and well up the mountains. *Pyrocephalus* very tame, allowing themselves to be knocked down with a gun-barrel. Secured a small mouse. At 1.40 we started for vessel (it was so wet that we could not camp for the night), arriving at beach at 6.20. I was very tired, and shall remember this as a very hard trip. Found the boys had put up about thirty skins.

Sept. 30.—Hoisted anchor after breakfast and started for Sullivan Bay; but the wind died out entirely, and at bed-time we had made no progress. Put in the day packing birds. To-day it has been very hot.

Oct. 1.—Still calm till about 3, when it breezed up, and in the night we arrived off Sullivan Bay. Laying-to till morning.

Oct. 2.—This morning at 8 we landed on the beach in Sullivan Bay. All this end of the island is principally lava. A few bushes and cactus are scattered about. Obtained about forty odd birds. They are in much poorer plumage than those at James Bay, being much worn. This is evidently entirely due to the rough, harsh nature of the surroundings. This afternoon we have been sailing towards Indefatigable Island. We are in hopes of striking water.

Oct. 3.—Spent the day beating up from off Seymour Island to Gordon Rocks, looking for water, as Pilot book says there is water on N.E. side of Indefatigable. Presume this is a typographical error, as there **is no water here.** They undoubtedly allude to a place called Puerte de la Aguada, twelve miles from N.E. end. About 4 we dropped anchor in 15 fathoms in the passage between rocks and mainland. Just as we were anchoring sighted a small boat in the passage with several people in it. Hoisted a flag and pulled over to the boat. Found an Englishman, T. Levick, with a Portuguese and an Indian from Charles Island. Invited them on board. They had supper and will sleep on the vessel. Levick says that Charles Island now has fifty people there. It is being colonised by a man by name of Gill, from Guayaquil. He says that it is almost impossible to get to the top of Indefatigable. He says there are donkeys, dogs and fruit away on the top of the island, and goats on Barrington. He gave us much information, which will be of use, in return for a little flour and tobacco.

Oct. 4.—This morning early we bade our Charles Island friends good-bye. Landing about 7, we secured a few birds—mostly in worn plumage. Came on board

at noon, hoisting anchor after dinner and heading for Barrington. Took care of our birds in the afternoon.

Oct. 5.—Anchored at N.E. end of **Barrington Island** in 10 fathoms at 10 a.m. After dinner all hands went on shore to kill some goats. Beck, Hull, and I each killed one out of a dozen. We also secured a large land iguana and saw several more. This iguana lives in holes. Is a dirty-white in colour, with indistinct blackish patches, and has red eyes. This is the first island that we have observed land iguanas on. We saw a swallow with white belly, but were unfortunate in not getting it.

Oct. 6.—All hands collected this morning, getting about 55 birds. Beck got into a "village" of iguanas, and killed about 25. I saw, for the first time, to be reasonably sure of it, the *Progne modesta*. The swallow that I saw yesterday was probably the one seen by Baur at Indefatigable. Black *males* of *Geospiza barringtoni* of Ridgway (= *G. scandens fatigata*) were quite common. Beck shot an owl on board vessel this evening.

Oct. 7.—We put up about 45 birds and secured a bat, also the first snake here —35 in. long, greyish ground colour, brown spots, gray gold eyes; also a large centipede. Took a picture of and afterwards killed with a stick a *Butorides plumbeus*, which came and stood on point of the vessel this morning. Last night Beck killed an owl on the vessel with a stick.

Oct. 8.—All four of us, with the mate and a sailor, went after iguanas, capturing ten alive, and getting a dozen which we skinned. The iguanas must be about ready to lay their eggs, as most of the *females* have nine to fifteen large eggs in them. Hoisted anchor at 4 p.m., and set sail for Chatham. (300 gal. of water left; no chance to obtain any to-day; have been looking for it, and must now go to Chatham.)

Oct. 9 and 10.—Arrived in Wreck Bay on **Chatham Island** yesterday, 1.30 p.m., dropping anchor in five fathoms off the Cobos Storehouse. Soon after we were boarded by Captain Barnhoff, master of a schooner which lays in the bay, belongs to Guayaquil, and is chartered by Cobos to carry sugar. Also the Equadorian Government representative on the island, and two other Spaniards, bringing a package of mails and a letter from Señor Cobos, inviting us to come up to the Hacienda, saying that there were horses at our disposal. After reading letters went ashore. The two captains, Hull, and I mounted horses and rode up the road towards the hacienda, about five miles from the bay. The road is a nice one, and about a mile below the settlement you come to a gateway with the words "El Progresso" above it. From here to the settlement there are large sugar-cane fields on both sides. Lemon, orange and fig trees line the roadside. On arriving at Señor Cobos' house we were met by him, and were entertained at supper and through the evening. Cobos is a typical Spaniard. His house is the only one of any pretensions; the others are all cane huts. He has a sugar refinery, and sells his sugar in Guayaquil. He has 800 acres of sugar cane, 1500 coffee trees; raises oranges, lemons, figs, yucca, cabbage, bananas, and some other tropical fruit. He has 500 tame cattle, and 1000 wild ones run over the island. Wild dogs abound on the island. We saw *Progne modesta*, also the other swallow, which is our American barn swallow. We saw a number of cuckoos (*Coccyzus*). Señor Cobos has got a fine place here, and he is practically king. The rest of the population are entirely dependent on him. There is also an Ecuadorian Government official and some soldiers.

Mr. Cobos' engineer is a German. The hacienda looks much like a Californian ranche. Yesterday was a feast day, being the seventy-seventh anniversary of

Ecuadorian independence; and in the evening the peons were cutting up "high jinks," dancing in the "salon," and drinking native brandy. The four of us slept in one room, returning to the vessel about noon to-day.

Beck, Drowne, and the mate came up to the ranche early with cameras, and returned with us at noon. I contracted with Cobos for water, fruit, etc. Hope to get some shoes here, as we need them badly. The population consists of Ecuadorians, Peruvians, Mexicans, Negroes, Crosses, and a German.

Oct. 12.—This morning Beck, Hull, and Drowne collected about forty birds. Cobos and Superintendent took dinner with us at 1.30, Hull and I returning to the ranche with them. After we got up there Hull shot five ducks, which we presented to Cobos. I shot two swallows. They were flying about the sugar house. It is undoubtedly the same bird that I saw at Barrington, and that Baur saw at Indefatigable. Stayed all night at Cobos' house. During the evening he entertained us with guitar and song. After coffee Hull and I collected about the building and to the port. I shot two *Progne modesta* and three cuckoos, the first of the trip. *Geospiza* are not abundant on this part of the island. During the afternoon we put up nearly sixty birds. Have seen several *crickets*. Am quite sure last evening that I saw *Strix* fly by me!

Oct. 13.—This morning Hull and Beck collected about fifty birds. I was busy about other things myself all day. This afternoon the captain and mate went up to the farm, and will probably stay all night. Cobos sent down nails and box of lemons.

Oct. 15.—Yesterday morning all of us started at 6.50, and walked up to Cobos Farm. Collected till noon, a Señor Seri showing us about. Seri says that there are humming-birds on the island, flying around the coffee trees (? !). In the afternoon explored the top of the island on horseback. In the evening walked to the vessel. A hard, long day's work in the tropics: 20 miles walk, 15 on horseback. Curlew and turnstone were in the fields at the summit of the island. Ducks in a lagoon at the top. Cobos has been sending down water, vegetables, etc., as ordered.

Oct. 16.—This morning Hull, Beck and Drowne collected. Beck got a specimen of our bobolink (*Dolichonyx oryzivorus*). It was feeding with a flock of *Geospiza* on the beach near the storehouse. Cobos failed to send down the balance of water to-day; this will delay our getting away. We put up about sixty birds. I gave Captain Barnhoff a package of letters to be posted in Guayaquil. He sails to-morrow.

Oct. 17.—This morning I walked up to the hacienda to try and hurry the water down. Found it being loaded. Paid Cobos his bill and took breakfast with him. Both schooners hoisted anchors together, and Barnhoff beat us to north end of island. We hope to land on Chatham to-morrow.

Oct. 18.—Last night we drifted away and got to leeward of north end, and are spending all day in beating up. Such losses of time are very disgusting.

Oct. 19.—This morning we were able to land on the north of Chatham Island about 8 o'clock, and collected about 75 birds. The *Pyrocephalus*, *Buteo* and *Nesopelia* were entirely absent from this part of the island. Started for Hood at 4 p.m.

Oct. 20.—Have been trying all day to beat by N.E. end of island, and have gained nothing. Put up our birds. One of the large tortoise died. None of the boys have been feeling well to-day.

Oct. 21.—Have been making fair headway towards Hood.

Oct. 22.—At 11 o'clock the vessel dropped anchor in 7 fathoms at Gardner Bay

on **Hood Island**. In the afternoon all went ashore to prospect and get a little goat meat if possible. Beck killed two. Four snakes were seen, two taken—brownish back, cream below, three yellowish white stripes. Got centipede and four owls. Very hard walking.

Oct. 23.—Beck, Hull, and I collected this morning on Hood Island. Got a nice lot of birds and lizards, and one snake. Put up about 70 birds to-day. We got a *Larus* not yet recorded on this island.

Oct. 24.—Did part of forenoon's work, then cleaned up.

Oct. 25.—Collected about 75 birds and put them up. Saw a *Progne modesta*. This afternoon the mate went after goats. Did not get any, but brought back three albatross' eggs, and reports a large colony breeding on the other side of the island. Will go there to-morrow. Hull secured a dove with a considerable amount of white on it.

Oct. 26.—All hands started for the interior of the island at 7; the mate after goats, the rest of us after the albatross. We found large colonies of them from the centre of the island, south and west. These albatross have evidently used this island as breeding grounds for many years, the out-cropping rocks being worn smooth by the feet of the birds. The birds are not breeding now, as the eggs which we secured had all been deserted. There are numbers of young albatross, about the size of a "grown" goose; feathers appearing much like those of an ostrich.* There must be thousands of birds on the island. We brought back sixteen of them. They have a manner of fencing with their bills that is ludicrous and remarkable (see illustrations in Drowne's notes). We found on the south end of the island a colony of frigate birds breeding. Tropic birds quite plentiful. Secured eggs of *Sula variegata* and *nebouxii*. Marine iguanas very abundant and brightly coloured, black with greenish-yellow and reddish yellow blotches (see Plate V).

Oct. 27.—Worked all day putting up birds.

Oct. 28.—Seven of us made a trip across the island to-day, bringing back 20 tropic and 25 other birds, also eggs of the former, of *Creagrus*, *Albatross* and *Fregata*, *Sula variegata* and *S. nebouxii*. Had a very hard day's work.

Oct. 29.—Put up to-day over forty large birds. Have been wrapping birds in tissue paper, and find it excellent.

Oct. 30.—At 4 p.m. hoisted anchor and set sail for Charles Island. Will stop a couple of hours at Gardner Island, near Charles Island, on the way.

Oct. 31.—Arrived off Gardner Island at noon. Went ashore and stayed till 4 p.m. Got about thirty *Nesomimus*. *Sula nebouxii* and *Cyanops* were both breeding, also frigate birds. Tropic birds were common, probably breeding. One of the iguanas died to-day; they are not eating at all.

Nov. 1.—This morning found us off Black Beach Roads. At 10 a.m. we dropped anchor. Put up yesterday's birds during the morning. **Charles Island**. After anchoring Mr. Levick came aboard, and the captain and I went to breakfast with Mr. Gill. After breakfast Mr. Gill with several Señors and Señoritas came aboard, when we treated them to wine and bread. There are several tame flamingoes at the settlement. Mr. Hull also has some tortoise from Albemarle.

Nov. 2.—All hands, with Levick for guide, went to Upper Springs, six miles. Got over sixty birds, which we put up this afternoon. Got four species of *Camarhynchus*, *Pyrocephalus* and *Geospiza*, cuckoo, curlew, and plover. Saw one small butterfly. **No lizards seen on Charles Island!**

* Unfortunately no young albatrosses were preserved!—Ed.

Nov. 3.—Hull, Beck, and Drowne collected in the morning till 9.30. Secured two swallows, the same as taken on Chatham. At 4 p.m. gave a dinner on deck for Mr. Gill and a half-dozen others. In the evening sent up some rockets, and Drowne favoured us with flute music.

Nov. 4.—The three boys collected to-day and put up birds. Mr. Gill sailed for Chatham to-day. I sent a letter to Cobos.

Nov. 5.—Collected all day, going to Plantation and Upper Springs. Hull and Beck got eleven *Certhidea*. **Certhidea are not recorded for this Island.*** Nine have ebony-black bill, tarsus, and feet. I secured a bobolink which was very wild, and a swallow, and five martins. Beck found a nest of *Pyrocephalus*. One egg just hatching, one bird in down. Nest of moss, resembling Californian bush tit's nest. Egg ground-colour cream white, lilac and brown spots, ring about large end. Beck secured some live snail shells; first found.

Nov. 6.—Got four barrels of water, all that we can get. Saw a dozen penguins.

Nov. 7.—About ten went ashore and bade people good-bye. After dinner hoisted anchor for Post Office Bay, Captain Levick going with us.

Nov. 8.—Went ashore early, hoping to secure a lot of flamingo, but found only one at lagoon, which we did not get. A hundred or more ducks were in the lagoon, We shot ten or more. Birds are scarce here, so I have decided to start for Albemarle without delay. The mate took Levick back to the settlement in a boat this afternoon.

Nov. 9.—Last evening Otto returned from taking Levick home. The captain wanted to know if I would get one of Mr. Hill's sloops for several weeks to go to Albemarle with us ; he was afraid to go with his vessel, he claiming there was no suitable anchorage on the east side. I told him No ! that I had hired his vessel for the trip, and I meant to go where I wanted to in her ; that I was not unreasonable, and that I would not ask him to anchor in a place that was unsafe. . . . We left Post Office Bay before breakfast, and at 3 p.m. we were at anchor between Brattle and Albemarle. **Brattle** is too steep to get up on, so we shall have to skip it. It is scarcely more than a rock, and probably has not much on it, but sea birds breed on it.

Nov. 10.—**Albemarle Island**. All hands collected. We got seven flamingoes, and killed three more, which we could not get out of the lagoon. I found one tortoise, which we got aboard. Saw some large white herons. It is terrible getting about here.

Nov. 11.—Drowne stayed on board this morning to skin birds ; the rest of us collected. Beck got a fine white heron.

Nov. 12.—Started back towards the interior of the Island; got back about seven miles. I secured an Albino *Geospiza*. We found a dozen or more tortoise, but it is very hard getting them out. A number of places where the tortoise had laid eggs were found, but dogs had dug out and eaten the eggs. Trails were observed here similar to those of Duncan Island. Beck and Drowne got entangled in a mangrove swamp, and it was long after dark before we got them out. We found birds very scarce. Beck shot a dove, which he lost in the mangrove swamp. Beck and Drowne also secured eggs of tortoise.

Nov. 13.—Took care of our birds to-day.

Nov. 14.—Sunday, and a quiet day.

Nov. 15.—Took the yawl-boat and made a trip to La Posa. Got flamingo, penguin, and *Sula*.

* This is *Certhidea olivacea ridgwayi*, subsp. nov.

Nov. 16.—The boys skinned birds, and I went in yawl-boat to locate Tortugas Port. We found the place all right. There is a shanty and a few plantain trees. This is the place where Cobos' men secured the few tortoise which we purchased of Mr. Gill.

Nov. 17.—Worked putting up specimens in the morning ; after dinner hoisted the large anchor, and then started to pull in kedge, which was out with 120 fathoms 5-in. rope cable. Found it caught in the rocks, and lost it with 12 fathoms of cable. After two hours' work got about a mile, and then the captain anchored again.

Nov. 18.—This morning pulled down to shanty, and collected all day. I shot at some cattle, but failed to get them. We tried to get back towards the mountain, but found it useless, so decided to leave for Iguana Cove. The wind is getting very light, and we must hasten things to get away before the calms set in for good.

Nov. 19.—This morning at 5 we started to get under way. There was a fair breeze blowing. We had no sooner got the anchor up than the wind died out and we had to drop it again. During the morning the captain made kedge and pulled the vessel ahead, and about noon caught a light wind and got shored, the tide taking us towards Iguana Cove. During the afternoon we saw an Albino *Anous*, Put out the boat and worked hard to get it, but were not successful.

Nov. 20.—Light wind and current took us off Essex Point during the night, but we were ten or twelve miles off the shore at dawn. A good breeze got us up to Iguana Cove about 10 a.m. The captain stood in four times to within $\frac{3}{4}$ to 1 mile of the shore, and declared it was not a safe place, and would not anchor. I requested him to put out the boat, but he refused. I have lost much time in this manner. He now proposes to lay-to.

Nov. 21.—This morning it is calm, and has been all day. At breakfast we were ten or more miles off the island.

Nov. 22.—Calm again to-day, and we are a long way from the island. In the night the captain won't get nearer than 6 to 8 miles of the island ; and before he can get to the place in the morning the wind is gone. He proposes to-day to leave the islands, as they don't want to get caught in calms. Had the boat out to-day, and collected 25 petrels.

Nov. 23.—Last night at 11 got a breeze, and at 12 headed for Iguana Cove. At 2 p.m. were below Christopher Point, and began tacking in hopes of getting to windward of the Cove by morning, so as to make a landing. We are not going to be able to do a great deal here. Hope that the wind will hold for 24 hours longer.

Nov. 24.—Wind very light last night; at dawn vessel was 15 miles off. The captain simply won't keep near land at night. The wind freshened during the morning, and we tried to make Iguana Cove, but we found it useless ; so I told the captain to head for Webb Cove. We just about got to the Cove at 4 p.m.; the wind failed us, and we had to get away the best we could. The captain says he won't go to Elizabeth Bay, and almost refuses to go to Tagus Cove. I can't force him to go where he says he won't, and I am sure I don't know what to do. The only thing I can do is, to try and make him hold his ground here till we get a wind that will give him courage to try and go on. I told the captain that he would have to make Tagus Cove if it took a month to get there.

Nov. 25.—During the night sailed for Tagus Cove, around Narborough Island, and this morning were half-way there. We were favoured by wind and current till 4 p.m, when the wind died out ; but we still made headway, getting within one mile

of Cove, when we had to lay-to on account of the darkness. Narborough is almost destitute of vegetation, and it will be almost impossible to do anything about exploring it.

Nov. 26.—This morning we were out at the mouth of Black Bight ; it took us till noon to get up to Tagus Cove ; got anchored in 10 fathoms at 2.30 ; took boat and hunted up watering-place, and prospected around a little.

Nov. 27.—Collected this morning till 10. I shot at and wounded a small falcon, about the size between sharp-shinned hawk and duck hawk.

Nov. 28.—We all went up the mountains to-day, and got forty birds. Saw signs of tortoises ; but they must be very scarce, as we did not see any.

Nov. 29. Put up birds in the morning ; collected a lot of sea-birds in the afternoon.

Nov. 30.—Put up birds ; collected penguins and sea-urchins.

Dec. 1.—To-day ushered in by severe S.E. squall. Worked on penguins ; they are very fat.

Dec. 2.—Collected land birds. Hull shot a cuckoo, but it was too bad to save. Beck saw another, but could not get it.

Dec. 3.—Packed birds, loaded ammunition, etc. In afternoon went to Turtle Mount, got five turtles, iguanas, birds, and a mess of ducks for dinner.

Dec. 4.—Put up birds, and in the afternoon the boys got some iguanas.

Dec. 5.—Sunday. Rested.

Dec. 6.—Went to Narborough in yawl-boat to-day ; got about thirty land iguanas. Iris a yellowish white spangled with gold, as in some fish. Much more shy than Barrington iguana.* Shot four **Cormorants** (*Phalacrocorax harrisi*). The birds were in the surf, and very hard to get ; a dozen or more seen. I noted that they appeared to be able to remain under water when they dive longer than any birds I have seen. In diving they jump out of water like a porpoise.

Dec. 7.—Put up birds in the morning, and in the afternoon worked on iguanas. After supper a bat flew about the vessel, and was wounded by Beck ; but we failed to get it. This is the only bat that we have seen on the trip.

Dec. 8.—Worked on iguanas all day. About 5 p.m. the English cruiser *Leander* and torpedo destroyer *Virago*, steamed into the Cove, and anchored close to us.

Dec. 9.—In the morning the boys collected iguanas and star-fish, and got cactus for tortoise. In the afternoon the officers came aboard and looked at curios, and invited me to dinner ; also offered to take letters to San Diego. Passed a very pleasant evening aboard the cruiser.

Dec. 10.—English vessels steamed out about 9 this morning. One of the lieutenants came aboard just before leaving, bringing the commander's compliments, with some novels and papers.

Dec. 11.—Tried all day to get away, but the wind was too light.

Dec. 12.—Not wind enough to get away to-day.

Dec. 13.—Tacked out on a S.E. wind about 10 a.m. Wind N.W., and tacking to go round north head.

Dec. 14.—Have not made any headway to-day. Wind mostly S.W., and light. Drifting N.W. During the afternoon we sighted a square rigger between us and Redundo Rocks, heading towards Black Bight.

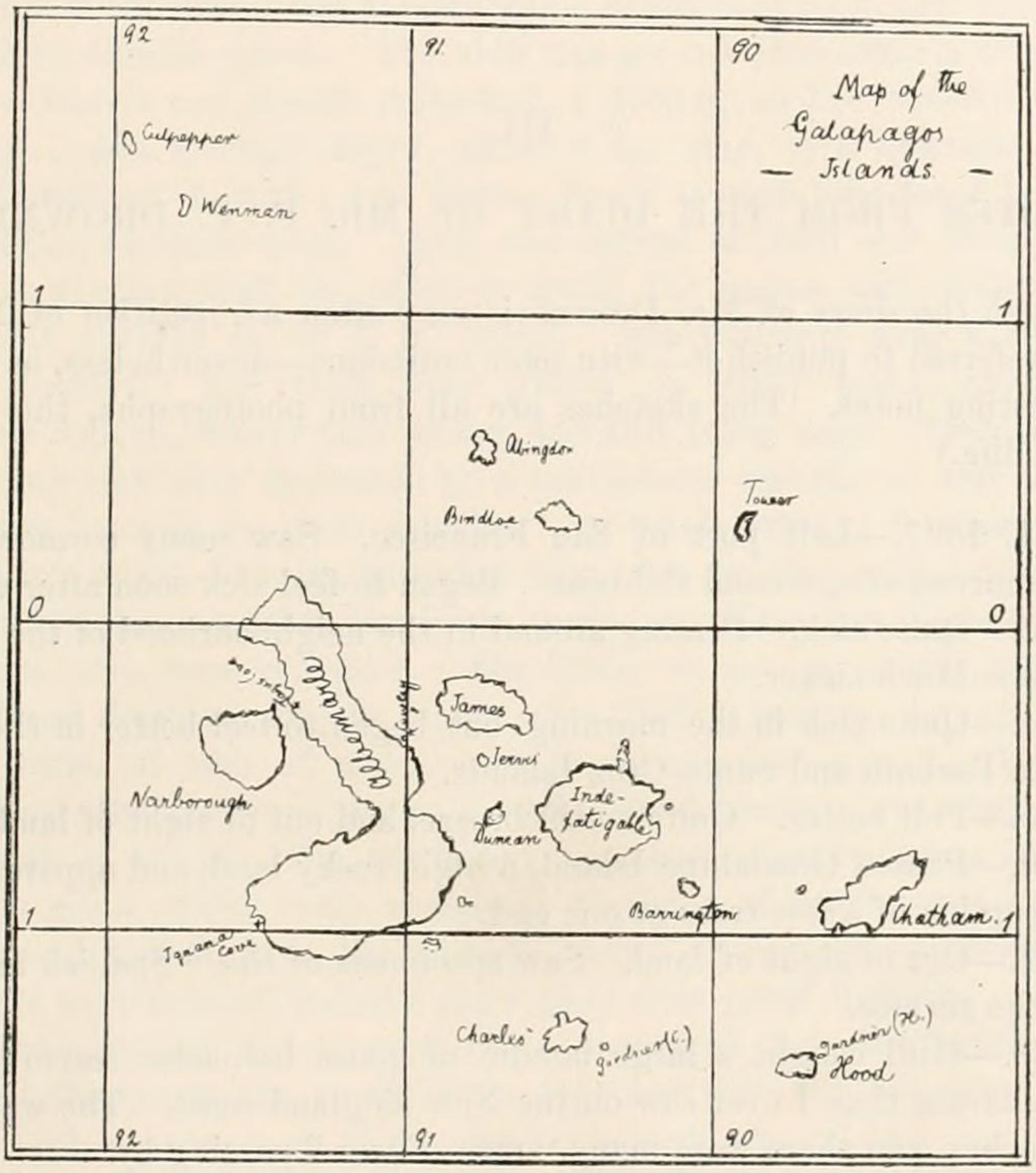
* These are very remarkably coloured, and belong to a distinct local form, which we propose to name *Conolophus subcristatus pictus* subsp. nov. (see p. 133).

Dec. 15.—Don't gain anything. Winds light, and drifting N.W. In the afternoon Beck shot from the vessel an unrecorded gull. Feet and legs black; bill bluish, none back of tip; eyes medium brown. ♀.

Dec. 16.—Same old story. Head S.E., drift N.W.

Dec. 17.—Some wind all day. At noon Redundo Rocks bore S. instead of S.E., as it has several days.

Dec. 18. This morning I found an egg in Tortoise Pen. 4 p.m. finds us 6 or 8 miles due N. of Abingdon Island. At supper the Captain said we had better get out of this. He fears being becalmed. I told him there was a month yet to reach Tower. Saw three Culpepper terns last night, evidently bound for that island.



Dec. 19.—Strong head wind all day. At 5.30 p.m. about 10 miles N.E. of S.E point of Abingdon.

Dec. 20.—Wind S.E., sailing E. Drifts N.E., sailing S.W., and drift N.W.

Dec. 21.—Same thing.

Dec. 22.—Same.

Dec. 23.—Found at noon that we had made some progress to the southward, and were just east of Tower in long. 89° W. Wind has been pretty steadily S.E. since the 20th. This afternoon southerly.

Dec. 24.—At noon, long. 88° 51′; lat. 1° 28′.

Dec. 25.—At 8 a.m. sighted **Tower Island,** 15 miles N.W. Anchored off the north end at 3 p.m. Got cactus for tortoise. They were pretty hungry.

Dec. 26.—Collected over ninety birds. Put up some thirty in the afternoon. Boobies, gulls and frigate birds are breeding here.

Dec. 27.—Collected about 150 birds. Got a lot of cactus for tortoise. Have decided that there is too much risk in trying to reach Cocos Island. Main reason, if becalmed for a while we should lose the tortoises, run short of food, and have trouble with captain and crew ; so in the morning will set sail for California.

Dec. 28.—After considerable delay got under way at 8 a.m. Worked all day putting up birds. The distance sailed from Tagus Cove to Tower Island by log registered 1400 miles ; true distance 110 miles ; the difference lost by drifting ! Reached San Francisco on February 8th, 1898.

III.

NOTES FROM THE DIARY OF MR. F. P. DROWNE.

(Although the diary of Mr. Drowne is very often a repetition of Mr. Harris' notes, we preferred to publish it—with some omissions—nevertheless, as it contains many interesting notes. The sketches are all from photographs, the albatrosses drawn from life.)

June 21, 1897.—Left port of San Francisco. Saw many cormorants, gulls, Californian murres, etc., around the boat. Began to feel sick soon after starting.

June 22.—Quite sick. Beating around in the neighbourhood of the Farallones.

June 23.—Much sicker.

June 24.—Quite sick in the morning, but began to feel better in the afternoon. Passed Santa Barbara and Santa Cruz Islands.

June 25.—Felt better. Quite a stiff breeze, and out of sight of land.

June 26.—Passed Guadalupe Island, a high, rocky land, and apparently barren, with the exception of a few trees at one end.

June 27.—Out of sight of land. Saw specimens of the " Spanish man-of-war " floating on the surface.

June 28.—Hull caught a large bundle of goose barnacles resembling *Lepas fascicularis*, larger than I ever saw on the New England coast. The water was full of these bunches, and there were many " men-of-war " passing by.

June 29.—Felt quite sick in the morning, but took a bath after dinner, and felt much better. Ate a good supper—my first meal since we left San Francisco. In the evening felt well enough to play the flute for a while. The " Spanish men-of-war " covered the water, and were visible in the moonlight for a long distance.

June 30.—Felt like myself again. Saw a red-billed tropic bird, which circled around the vessel a few times. Not much wind.

July 1.—Beck shot a pair of red-billed tropic birds (*Phaëthon rubricauda*), and two shearwaters ; also found a small crab attached to log-line, an adult female with eggs. Each of the party made up one skin. Later Hull shot another tropic bird (eye very dark brown, feet a greenish white and black). Harris shot two red-footed boobies (*Sula piscatrix websteri*), (eye hazel-brown, feet salmon, around eye violet blue, naked pouch nearly all black, around base of bill a light pink, bill very pale horny green).

July 2.—Birds very numerous ; several boobies were shot, also three frigate birds. The latter were so poor in plumage that they were abandoned. Came in sight of **Clarion Island** at about 3 p.m., and at 5 the island showed up quite plain. Boobies and frigate birds were very tame. Towards dark the vessel was " hove-to," it not being thought safe to anchor.

July 3.—Had drifted during the night a considerable distance from the island, and it took till noon to come to an anchorage. **Clarion Island**, lat. 18° 20′ N., long. 114° 44′ W., belonging to Mexico. Beck took a photograph of the island from N.E. to S.W. We came to anchor off the west shore, where there was a sandy beach. The boobies came off in numbers and lighted on the higher parts of the rigging. One could see many thousands of them on the island in different " rookeries." On the N.E. edge of the island was a remarkable monument rock, and near it an arch surmounted by several spires. The skiff was got out immediately after coming to anchor, and Harris and myself embarked, I getting on the island first. Almost immediately I saw a small lizard, about 6 in. long, of a greenish blue colour, sunning himself on a rock ; and Harris found several blue-faced boobies (*Sula cyanops*) sitting on their nests. Upon the arrival of Hull and Beck we set out, following a winding trail in order to avoid the cactus with which the island is about half covered (2 or 3 ft. high). Ate luncheon near a colony of the blue-faced boobies. The birds were sitting on their nests, some containing young nearly fledged, others very young, and still other eggs. They showed their dislike of any very near approach by a continuous whistle, or else a cry resembling " krack " made in their throats. A small wren (*Troglodytes tanneri*), extent 7·51 in., length 5·51 in., was shot soon after landing, and a snake 4 to 5 ft. in length was taken. After luncheon work commenced in earnest, and many birds, snakes, etc., were collected. The birds, so far as noted, were red-footed and blue-faced boobies, frigate and tropic birds, ravens, doves, wrens, and burrowing owls, of each of which a good series were secured. The red-footed and blue-faced boobies were the only birds found nesting, and they as aforesaid had all grades of young. The red-footed species was found nesting in large heavy bushes ; the nests, which were composed of pieces of dried twigs loosely placed together, from 3 to 6 ft. from the ground ; only a single egg was found in a nest. The old birds were induced to leave their nests with great difficulty, and then only fluttered to the ground, and in most cases disgorged their last meal. The naked parts around the eye in the young birds, together with the bill, were black. The blue-faced boobies nested on the ground ; several sets of two eggs were taken. There were many frigate birds flying over the island, and occasionally one would chase a booby, tormenting it until it disgorged. The ravens were quite numerous, and several specimens were secured, although they were more wary than the other birds. Those secured were in very poor plumage.* The doves were very numerous and tame, all of them being secured with the auxiliary barrel. They were found all over the parts of the island that were visited. It is the *Zenaidura clarionensis*. The wrens were also very abundant. They had a pleasant song, and were also very tame. Several nests supposed to belong to this species were found in the bushes about 3 ft. from the ground. The burrowing owls† were found abundant, and a good number of specimens were secured. Their burrows extended down several feet in the light sandy soil of the island. The blue-faced booby builds no nest ; eggs laid on the ground in a slight depression. Two species of snakes were found. They

* Unfortunately none were preserved!—Ed.

† *Speotyto cunicularia rostrata*.

appeared to be quite common. Two species of lizards were also secured ; these little fellows, measuring about 6 in. in length, were very numerous among the rocks, where they jumped or ran actively about when approached. Large turtles and fish were plentiful about the island, and one large turtle was harpooned ; some turtle soup and curry made from it proved to be very good. [Green sea turtle.]

July 4.—Repeated the same operations as on the previous day. Secured an addition of many of the boobies' eggs and specimens of the birds, which we knocked off their nests with sticks. One species of spider, black, and spread legs, all about 1 in. Three species of butterflies,* several grasshoppers, bees and wasps. Left Clarion at 3.30 p.m.

July 5.—Commenced to skin the birds that had been secured. Weather very hot.

July 6.—Skinned boobies. In the evening one of the sailors crawled out to the end of the flying jib-boom and caught a red-footed booby which had been resting there most of the afternoon.

July 7.—Finished putting up Clarion Island material. It rained yesterday for the first time since we set out.

July 8.—Weather very hot with a little wind. All worked on the boobies' eggs. The eggs varied a great deal in size and shape, and presented all stages of incubation. A few tropic birds flew around the vessel.

July 9.—Weather very hot.

July 10.—Weather very hot. 6 a.m., temperature 80° in cabin, 84° on deck. Had a shower at noon, but it cleared off and became as hot as before in 30 minutes. Saw two petrels, which approached nearer to the vessel than any seen before. The flight resembled very closely that of a bat. Noticed many flying fish. They flew from 50 to 150 ft. at a time. They usually flew against the wind, or quartering to it. They frequently strike the water in their flight, resembling a shell skipping on the water.

July 11.—Rainy—a little breeze.

July 12.—Rain. A good breeze started in at 9 a.m., and continued all day and night. The temperature of the water at 4 a.m. was 80°.

July 13.—Saw a pair of albatross in white plumage. Breeze continued all day.

July 14.—Rained most of the time between 8 and 12, and then wind died out.

July 15.—Calm prevailed most of the morning, and rain at intervals. Breeze freshened in the afternoon.

July 16.—Large school of porpoise passed the vessel at about 4.30 a.m. Considerable rain.

July 17.—Quite a big sea on in the morning, and the decks were kept drenched by the spray and the water that came through the scuppers. Breeze continued very steady all day.

July 18.—Fine steady breeze all day.

July 19.—Fine breeze. A frigate bird came around during the morning watch, and spent about five minutes in trying to eat the truck on top of the main mast.

July 20.—Early in the morning a flying fish came aboard. A school of porpoise passed under the bow. A fine breeze all day. Weather very chilly in the evening. Saw a large turtle.

July 21.—Weather about the same. Saw another turtle.

July 22.—Breezeless. The mate struck a couple of porpoises, but failed to secure them.

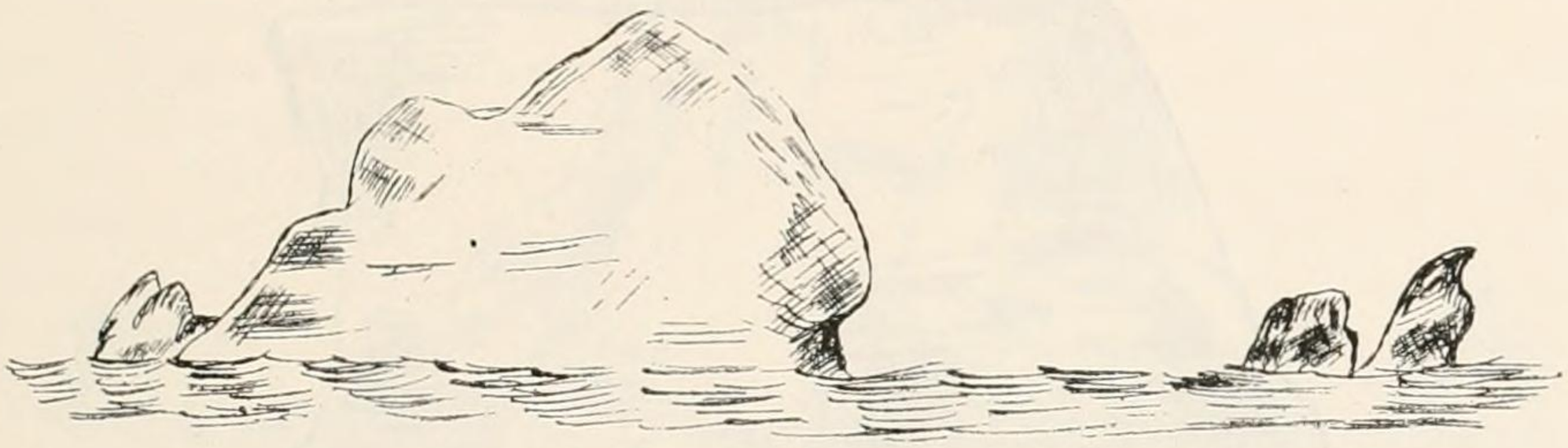
* One *Papilio troilus* (? subsp.) and two *Lycaenidae*.

July 23.—Fair breeze all day. At noon we were exactly two hundred miles from Culpepper Island, Galapagos group.

July 24.—Made very good progress. Came within fifty miles of the island. Birds were numerous.

July 25.—Found that the vessel had drifted during the night, and that we were sixty-five miles from the island. Made very slow progress, there being very little wind. Birds were numerous. Two species of tern observed (*Anous stolidus galapagensis* and *Sterna fuliginosa*)—one very abundant—and large flocks of them flew around the vessel, uttering their harsh cries. The black-headed gull, peculiar to the islands (*Creagrus furcalus*), was also out in numbers, and frigate birds, tropic birds, petrels, shearwaters, and sandpipers were noted. In the afternoon a flycatcher (*Myiarchus*) came aboard and lighted on the rigging, where he was caught in a net by Harris. The bird seemed very tired, and had evidently come a long way.

We came in sight of **Culpepper** at about 3.45 p.m., it being then about fifteen miles distant. The island was very bold and rocky in outline. As the distance diminished, cactus could be distinguished on the top and sides, and the white guano of the birds. The sides were almost perpendicular, nearly everywhere. On the top small bushes were seen. There were several caves in the lower parts of the



CULPEPPER ISLAND AS IT APPEARED FIFTEEN MILES OFF.

sides. Thousands of sea birds were flying over the top of the island, the air being fairly black with them. After running in close to the island, the vessel was put about, and we stood off for the night.

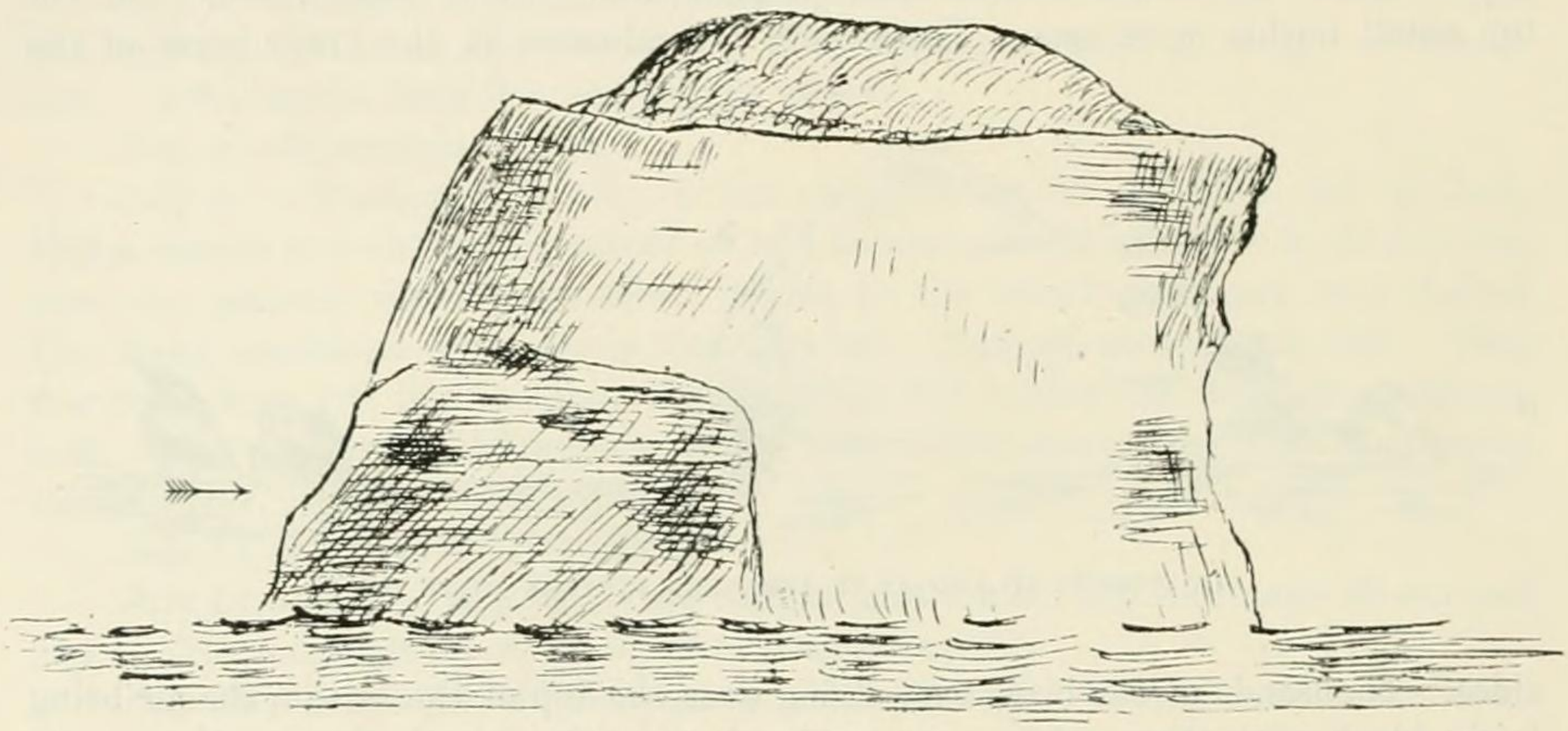
July 26.—From there we had drifted off a long distance with the current. **Wenman Island** was the next land sighted, and it resembled Culpepper in general outline. We steered for **Culpepper,** and arrived there about 8.30 a.m., where Harris and Hull were put off in the skiff, while Beck and myself remained on the schooner, which stood off and on near the island, it not being possible to anchor. Saw several seal (probably the fur seal), which swam around the vessel several times, coming up every few seconds to breathe. Saw one small turtle, 2 ft. long, and a shark. Saw a very few adult male frigate birds (entirely black), the proportion being 1 to 50 of the grey or younger plumage.

The little petrels were much tamer than those observed farther out, some of them approaching within five or six feet of the vessel.

Harris and party returned with a seal, some shearwaters, petrels, boobies, black and white terns, frigate birds, gulls; and also some land birds—doves, several species of finches, a sandpiper, mocking bird, and one warbler. Birds of several species were breeding. Frigate birds had their nests on the ground between the rocks, there being only one egg. The black tern were nesting in the rocks along the shore.

Iguanas of all sizes were abundant. The seal was the only one secured out of six or eight seen. No insects were seen except a small fly.

July 27.—Skinned birds all the morning. Immediately after dinner we got ready to go ashore, Beck and myself taking our guns. After a long and hard pull against current, wind, and tide, we were landed at the same point as yesterday's party. Harris shot two seals, one of which managed to get into the water, even with two bullet-holes through him. Doves (*Nesopelia galapagensis exsul*) were very numerous, and could be killed with stones. The finches were also very abundant, and seemed to like equally well the bare rocks along the shore and the vegetation higher up. Two or three specimens of the warbler were obtained. A slate-coloured tern (*Anous stolidus galapagensis*) was as thick as could be in some places, nearly covering the tops of the rocks. The nests of the frigate birds, composed of twigs, were placed among the rocks everywhere, while the young boobies kept up a continual squeaking from their nests in the bushes. Several shearwaters' eggs were taken. The one nest that I found was under a rock, almost



N.E. SIDE OF CULPEPPER ISLAND.
(All the collecting was done on the slope to which the arrow points.)

concealed by a pea vine. The cliff all the way up was covered with terns, gulls, and frigate birds. Some smaller crabs were feeding on young birds that had met with an untimely end. Shot a couple of red-billed tropic birds (*Phaethon aethereus*), which were in much better plumage than those secured some time back, the bills being redder and the tail feathers longer.* Many sharks were observed. The gulls were very numerous. The island is composed of sandstone and lava. It is rather dangerous in getting about in parts, on account of the softness of the stone, which sinks beneath one's weight. Shot twenty more birds—doves, finches, warblers, and one frigate bird. Left the island about 5.45, and reached the vessel at dark.

July 28.—Skinned birds all day.

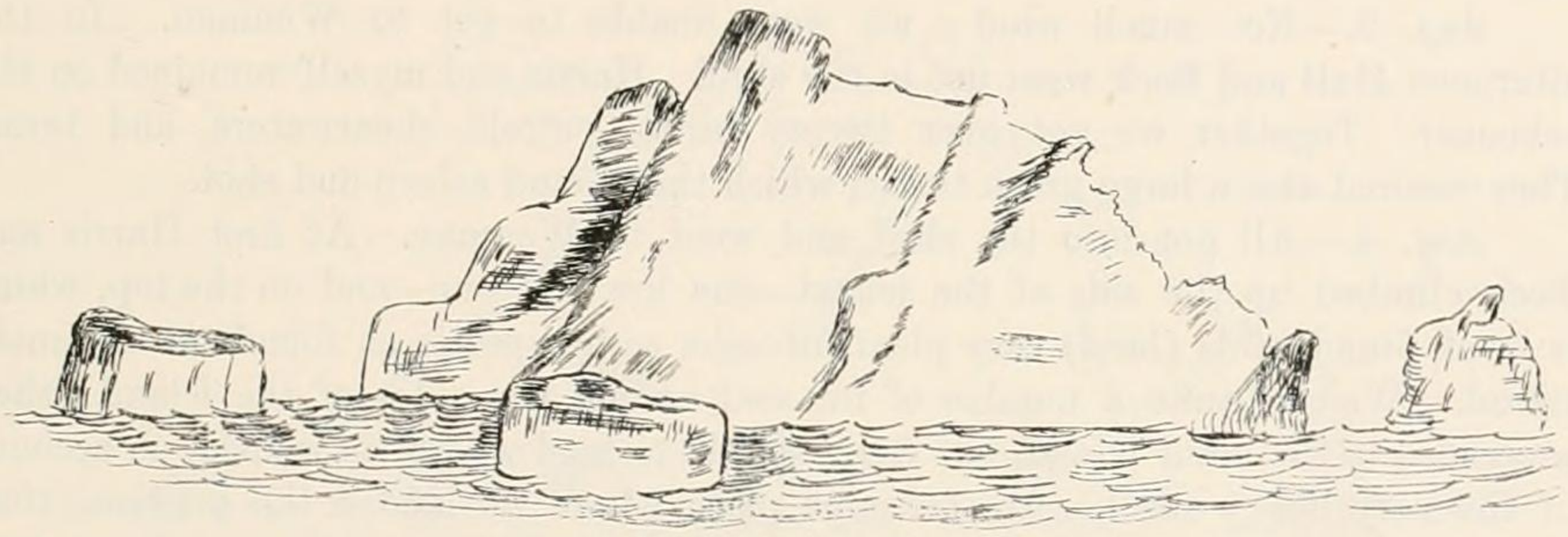
July 29.—All of us started to Culpepper before 9 a.m. Hull and myself were landed with instructions to get some frigate birds, boobies, gulls, etc. Harris and Beck kept around the shore awhile, and picked up three tropic birds, some terns and petrels. Immediately after we landed Hull and myself saw a large seal. When

* Those found near Clarion Island were *P. rubricauda*.—ED.

first seen he was asleep, but our footsteps awakened him, and he straightened up and looked at us rather curiously, and then began to move towards us. I got a little on one side and put a charge of No. 4 shot through his head, which made him bellow loudly. Hull finished him with another shot. Iguanas crawled around the rocks with an awkward movement ; all that I saw moved slowly. At lunch we all met again. The other party brought in a fur seal. After lunch I caught a few crabs, which were numerous.

Later on I went with the mate of the vessel on a dove hunt, on one of the side hills. We managed to kill a dozen with stones. Beck saw an owl, resembling our American short-eared owl. We left the island shortly after, and skinned a few birds before supper. It was quite interesting to watch the frigate birds chase the boobies and shearwaters, trying to make them disgorge their last meal. The frigate birds frequently kept up their chase five minutes or more, pursuing their victim closely wherever it turned. Gulls numerous. We collected quite a number. They had a peculiar way of commencing their cry : first making a sound resembling greatly the chirp of a cricket, the note then resembling that of other gulls. The tropic birds kept up a continual screaming.

July 30.—Skinned birds all day.



WENMAN ISLAND.

July 31.—Sailed to **Wenman** during the night. Early in the morning started out in a skiff. The water around the island was very smooth, and near the shore was full of brightly-coloured fish—some blue, green and yellow, and others striped with various colours. Large sharks followed the boat everywhere, and at times as many as ten could be seen (sizes 8 to 10 ft.). At the first landing-place a fur seal appeared, and upon being shot fell down near the water, where he was secured later, after a few blows with a club. The first shot started several more seal out from the rocks. Iguanas of all sizes were sunning themselves. Gulls (*C. furcatus*), terns (*A. galapagensis*), and frigate birds were **very** abundant. The boobies were also fairly numerous. After pulling along the shore and starting out some fifteen or twenty seal, we landed, and after a short climb reached the top of the island. Cactus was very abundant. The top of the island was covered with bushes about 6 ft. high, in which were nesting boobies and frigate birds. Some of the frigate birds had the gular pouch swelled up as large as a two-quart measure, looking exactly like a blown-up bladder, bright red in colour. Finches were very abundant, there being about as many as were seen on Culpepper. Mocking birds (*Nesomimus*) were more abundant than on the latter island. Doves were evidently quite scarce, only ten or so being seen. Several specimens of *Certhidea*.

A heron resembling the green heron was obtained, and several tattlers observed. In one spot on the top of the island we found about a dozen trees, 20 ft. or so high, resembling somewhat our wild apple. No insects were noticed on Wenman, with the exception of one grasshopper. The little shearwater found on Culpepper was found here also. The island consisted of three parts—viz., a small high rock, a low bare rock of considerable size covered with vegetation, and the main island (the only one visited to-day). This was much the same in appearance as Culpepper; one end was covered with vegetation, cactus bushes, grass, and a few dried dead trees; the rest, as far as observed, was merely a narrow rocky ridge. We saw here a couple of doves on the side of the cliff, evidently getting water. Probably enough rain-water is caught in the hollows of the rocks to sustain what birds live on the island. Shot altogether about sixty birds, which we skinned after getting back to the vessel.

Aug. 1.—Harris, with the mate and a sailor, went to the island after seal, while the rest loaded cartridges and attended to other matters. They brought back several seal.

Aug. 2.—Owing to lack of wind we were not able to land. There being no anchorage, the vessel has to lay off and on, standing off for safety several miles at night, and the wind dying out could not sail back.

Aug. 3.—Not much wind; we were unable to get to Wenman. In the afternoon Hull and Beck went out in the skiff. Harris and myself remained on the schooner. Together we got over twenty birds—petrels, shearwaters, and terns. They secured also a large green turtle, which they found asleep and shot.

Aug. 4.—All got into the skiff and went to Wenman. At first Harris and Beck climbed up the side of the island—the low flat one—and on the top, which is level, found birds (land) very plentiful—the same species as found on the main island. We saw quite a number of fur seal around the sides of the island; then proceeded to the main island, but were unable to land where we wished, on account of the very heavy swell. At the same place where we landed the previous time there was a better chance, although the surf was very heavy there. After eating luncheon we went ashore. Hull and myself climbed to the top, and collected a dozen birds each. Stayed there a little over an hour, and then put back to the schooner, securing a turtle on the way. There were many iguanas of all sizes. Among the rocks two species of sea urchins were found, and quite a number of shells. Harris found a centipede about 4 in. long. I noticed several small sea anemones in a small pool among the rocks. Fish were very plentiful, especially one species, averaging 10 to 15 lb., which were so abundant that a skiff-load could be caught in 10 to 15 minutes (looked something like a cod). They were an excellent fish for eating. Noticed some of the finches climbing on a booby's back and pecking in the feathers—probably in search of parasites. **Saw three finches on one booby at a time.** Red-footed tropics, tattlers, and black tern quite abundant on Wenman. Saw no tracks or indications of tortoise. Upon reaching the vessel we headed for our next port—Abingdon.

Aug. 5.—Skinned a few large birds that were left over—one that fell to my share being a frigate bird. Length, 4 ft.; extent, 8 ft. No wind during the day.

Aug. 6.—No wind. Had drifted farther north than Culpepper. Vessel headed S.E. made several miles directly N.W., owing to strong current.

Aug. 7.—Drifted about generally; not able to take observations, as there was a thick fog.

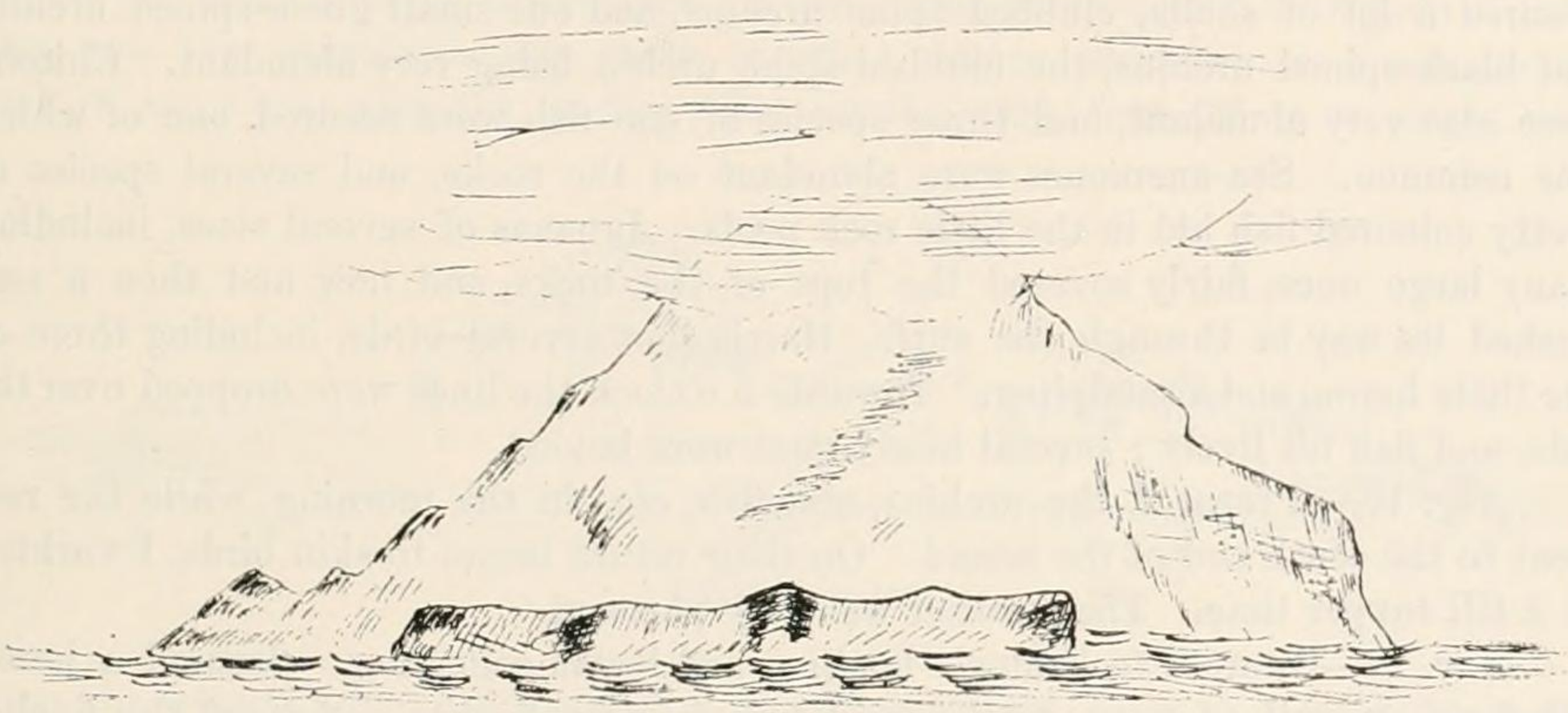
Aug. 8.—The morning was very cloudy, and the sun when rising looked very much like a fire opal. First one half appeared, then the other, but one half being visible at a time. It arose from the water, and disappeared in 3 or 4 minutes. A little wind, but made slow progress.

Aug. 9.—Calm prevailed during the morning, but in the afternoon a good breeze sprang up, which lasted until 12 at midnight. Passed through the largest school of porpoise since starting—a thousand might be a fair estimate.

Aug. 10.—A little wind early in the afternoon, which gradually freshened to a six-knot breeze. Saw a sperm whale at 5.15 p.m. The man at the wheel sighted land—probably the northern end of Albemarle.

Aug. 11.—Drifted around all the morning, the wind having died out during the night. Albemarle was still visible. In the evening sighted **Abingdon Island.**

Aug. 12.—The wind, which had continued all night, nearly died out in the morning. At dawn Abingdon came into view, but the morning was misty, and it did not show up plainly. The breeze freshened again a little later, and at 9.30 a.m.



ABINGDON ISLAND.

the island was plainly seen. At 12.30 the mate and one sailor took the skiff and started to sound. They found an anchorage about 300 yards off shore. Many seals, large turtles, and sharks could be seen from the vessel, together with several species of birds new to us, including the gull (*Larus fuliginosus*), and one pelican, which Harris shot with the rifle. In its pouch were found about twenty-eight small fish ("sardines"). At 3.25 p.m. the anchor was dropped, and sails furled. It then being about supper time, we postponed going to the island till next day. On a small sand beach to the left of the anchorage a number of seals were playing, now wandering up the beach, moving their heads from side to side at each step, and then rushing into the breakers head first. In the water they swam on one side or on the back equally well, coming up every few seconds with a puff to take breath. Frequently they jumped out of the water from underneath the swells, exactly like the porpoise. Their cry while playing on the beach resembled at different times the bark of a dog, bleat of a calf and of a goat. Some land birds were heard, and a hawk was noted sailing over the island. The side of the island visible from our anchorage was well covered with vegetation, bushes, etc. While sounding a shark took the lead from the end of the line. There were several little sand beaches at

the foot of the low cliffs, and a rocky beach all the way along. A song resembling that of the cricket was noticed during the evening coming from the sides of the cliff.

Aug. 13.—Went ashore at a landing place about 1½ mile above the anchorage, at 7.30. The island was covered with several kinds of cactus, some tall, with thick trunks. There were also trees of good size, which were either entirely bare, or covered in part with long moss [orchilla]. Bushes averaging 4 ft. in height. Finches of several kinds were very abundant, and the dove (*Nesopelia galapagensis*) was everywhere. Hull counted thirty-five in one tree. Several *Pyrocephalus* were seen, and some *Myiarchus*, also a few *Camarhynchus*. Hawks were quite abundant, and quite tame. Two species of lizard were obtained, both of which were quite common. The entire northern end of the island is bare land. I lost myself, but I got aboard the schooner at 5.30 p.m.

Aug. 14.—Skinned birds all day. Mate went ashore in skiff, and brought back some shells and urchins.

Aug. 15.—Went ashore a little after 9 a.m., at the beach opposite our anchorage. Secured a lot of shells, clubbed spine urchins, and one small green-spined urchin, and black-spined urchins, the clubbed spine urchin being very abundant. Chitons were also very abundant, and three species of star-fish were secured, one of which was common. Sea-anemones were abundant on the rocks, and several species of pretty coloured fish hid in the little rock pools. Iguanas of several sizes, including many large ones, fairly covered the tops of the rocks, and now and then a seal pushed its way in through the surf. Harris shot several birds, including three of the little heron, and a sandpiper. Towards 5 o'clock the lines were dropped over the side, and fish bit lively ; several heavy ones were landed.

Aug. 16.—Prepared the urchins, star-fish, etc., in the morning, while the rest went to the south end of the island. On their return began to skin birds, I working at it till supper time. The weather was very pleasant.

Aug. 17.—Started to Friday's landing, and began collecting. Secured a heron (*Butorides*), gull (*Larus*), tattler, and ten or more finches. Noticed the finches feeding on cactus leaves, which had fallen to the ground. These must be almost moist enough to take the place of water. Also noticed ten or fifteen black iguanas (*Amblyrhynchus cristatus*) in the water swimming towards a rock (which was 100 to 150 ft. from shore). They were about 25 ft. from it. The rock was covered on the top with the iguanas. The mate caught some very pretty "bottom" fish.

Aug. 18.—Went to "Drowne's Landing" (as the boys named it, in remembrance of my misfortune), secured about twenty birds each, and left the island a little after 10.30, reaching the vessel in time for dinner. In the afternoon pulled up the anchor, and about 3 set sail for **Bindloe**, which was to be seen plainly. General conclusions regarding Abingdon are as follows: Abingdon is an irregular rocky island covered with more or less vegetation, except on the northern end, which is a barren lava bed. The vegetation consists of trees varying in size from 8 to 40 ft. in height, bushes of several kinds, and several varieties of cactus. Iguanas and two species of small lizards were very abundant ; hair seal, fish, and turtle are also abundant. Noticed a lurid reflection in the sky last night, which was thought to be a fire of some kind on James Island.

Aug. 19.—Nearly got out of sight of land. Fixed up a few birds that were left over. Loaded ammunition, cleaned guns, etc., all the morning. Came in sight of Bindloe again at 2 p.m., and sailed right up to it, the wind dying down when we

were a short distance off the north end. The island is like Abingdon, the north end covered with lava.

Aug. 20.—Tacked around the island all the morning and the first part of the afternoon, there being a fine breeze. Came to an anchorage at 4.30 p.m., on the north side of the island, in 11 fathoms. There were several sand beaches along the shore, on which hair seal were playing in numbers. *Procellaria*, *Aestrelata*, and *Puffinus*, two species of boobies, frigate birds, tattlers, black terns, gulls (*Larus*) were seen around the vessel. In the evening, soon after supper, Harris, with a couple of sailors, went ashore in the skiff after a large hair seal, which we saw waddling up the beach ; but it managed to escape.

Aug. 21.—Went ashore at 6.30 a.m. collecting. Found *Certhidea*, *Nesomimus*, and two species of *Geospiza* quite abundant. One other *Geospiza* and *Camarhynchus* also occurred, but were more scarce. Specimens of the warbler and *Myiarchus* were taken. I got a pair of oyster-catchers, and noticed " wandering tattler," curlew, heron (small), and turnstone, all of which, except the heron, were shy. The dark gull (*Larus*) was quite common. Numbers of the hair seal, together with big iguanas, lay on the rocks, sunning themselves. A long vine, covered with bean pods of large size, was very abundant. No shells or other marine animals were found on the rock or anywhere near the landing; but on the sand, from 25 to 40 yards back

Bindloe Island.

from the water's edge, the tests of a green spur urchin were abundant, about two hundred being picked up. I saw no insects except grasshoppers. Two species of crabs were quite common. Turtles seemed quite plentiful along the water's edge.

Aug. 22.—Went ashore at 6.30. Harris and Hull set out to cross the lava, while we went down to the beach. Found the sea urchin tests abundant in spots, together with crawfish shells, also dead shells of several species. Saw turnstones and yellow crowned night heron. Mate picked up a cocoanut on the beach, and bamboo poles (?) were quite frequently seen (on beach). Went aboard quite early. Other party returned at 3 p.m., bringing two specimens of another *Camarhynchus*, one new sparrow, and one flycatcher (*Pyrocephalus*).

Aug. 23.—Went on shore early and picked up a few birds. I got eight mocking-birds and another oyster-catcher. Came on board quite early. Hauled the anchor and set sail. Just before dinner weather very rough, and all our party felt rather bad, but Beck, Hull, and myself skinned part of the birds.

In general character Bindloe Island is a barren lava field, covered in patches with vegetation, thorn bushes, trees, and grass, but no cactus—this being true of north and south end. The two small finches were numerous, also the *Certhidea* and *Nesomimus*, but the rest of the land birds were rather scarce.

Aug. 24.—Weather very rough. The vessel had been heading east by south all night with a good breeze, in spite of which fact it made fairly good time east by

north. Same weather continued all day, and the main deck was kept continually wet. Bindloe was in sight all the afternoon. Rather chilly.

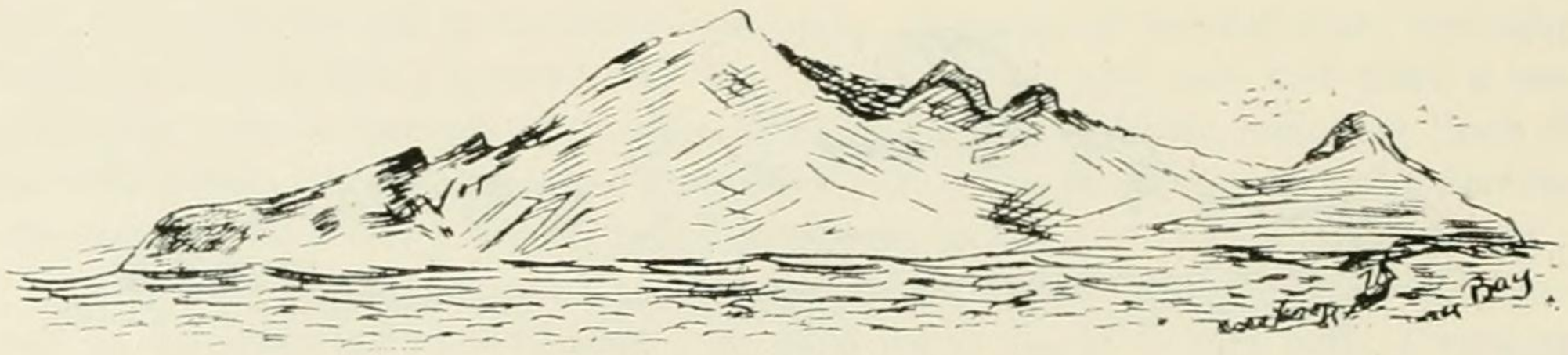
Aug. 25.—Fairly strong wind blowing, but sailed all day without seeing land.

Aug. 26.—Condition of affairs about the same.

Aug. 27.—Still sailing without any result. Our position at noon was 82 miles from Tower Island, the island bearing south-west. Temperature at 5 p.m., 69°. Witnessed a most beautiful sunset: the sun a clear ball of fire, descending rapidly into the ocean, the sky all around being a beautiful shade of red. Saw whales spouting near the horizon.

Aug. 28. Fine day. Came in sight of **Indefatigable Island** about noon, and towards night the outlines showed up quite distinctly. Tower Island also in sight. In the evening a light, without doubt a live volcano on James Island, was plainly seen near the horizon, making a beautiful sight, the sky all around being a lurid red with a large blaze in the centre.

Aug. 29.—I awoke to find the vessel surrounded by land; James, Indefatigable, Duncan, Jervis, Daphne, Guy Fawkes, Albemarle, Seymour, and Crossman (?) islands being visible. Our destination was Conway Bay, on Indefatigable Island. A little wind most of the morning, which gradually strengthened. Indefatigable Island appeared to be well wooded. The volcano could be plainly seen smoking on



INDEFATIGABLE ISLAND.

James Island. The Guy Fawkes and Daphne islands were merely good-sized rocks, with some vegetation. Came to anchor in Conway Bay (4½ fathoms of water) about 5 p.m. The water was very clear, objects on the bottom being easily distinguished. Saw several seals around the vessel. Noticed pelicans, frigate birds, shearwaters (*Astrelata*), boobies, and an owl (*Asio*).

Aug. 30.—Went ashore on Indefatigable early in the morning. Good beaches all along the shore. Found birds very abundant, several kinds of *Geospiza*, *Nesomimus*, doves, warblers, flycatchers, *Certhidea*, and several species of *Camarhynchus*. Water birds were quite numerous. Saw a number of pelicans, little herons, boobies, curlews, tattlers, and oyster-catchers. Hawks were very abundant, and a pair of oyster-catchers that Harris had shot attracted a flock of half a dozen. They soon ruined the pair. The island was thickly covered with tall cactus, trees, vines, and bushes, but was passable in some places. A fine little lagoon near the landing was bordered on two sides with mangroves. The rocks along the shore sheltered many sea-slugs and club-spined urchins. Weather rather warm. Came on board about 11 a.m. Skinned birds all the afternoon. An owl flew around the vessel in the evening.

Aug. 31.—Went ashore early, and got many birds. A small rat was taken, one of the three seen. Beck and Hull pulled two hawk-billed turtles out of the water and landed them high and dry on the beach. When the boat came after us about

noon we got them aboard, together with a sack of crawfish which we caught about the rocks. Had the crawfish for supper ; they tasted like our lobsters.

Sept. 1.—Went ashore early. I got *Pyrocephalus* and *Certhidea*, and found a hawk-billed turtle on the beach, which I turned over and dragged up high. Beck got two rats like the one secured yesterday. Several ducks and a couple of rail were taken in the salt-water lake near the shore. There was quite a flock of ducks (teal), which were very tame. Beck brought in about twenty-five doves, which he had killed with stones.

Sept. 2.—Went ashore early. Harris and Beck went down the beach to some salt-water lagoons after ducks and waders, while Hull and myself ranged along the beach in the other direction. I had very poor luck, getting one ♂ *Pyrocephalus* and and a couple of the little green herons, which I knocked over with stones. Harris and Beck brought back two stilts, two curlews, two tattlers, a turnstone, and some ducks. Several rail were also taken in the afternoon. The captain, mate, and sailors started off, and the mate brought back two eggs of the great blue heron, the remains of a set of three which he took from a nest 8 ft. up in a small tree.

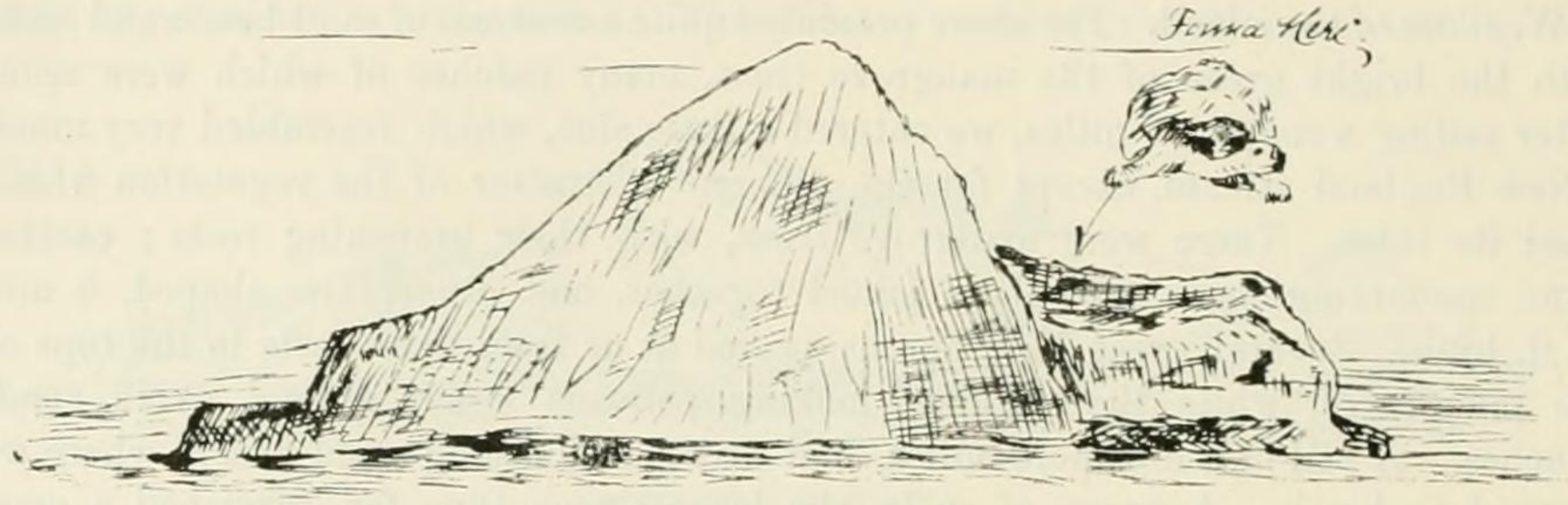
Sept. 3.—Started out at 7 a.m. in the yawl-boat, the captain, mate, one sailor, and the four collectors making the party. Leaving the vessel, we sailed along the N.W. shore of the island. The shore presented quite a contrast of sand-beach and rock, with the bright green of the mangrove trees, many patches of which were seen. After sailing a couple of miles, we entered a little slue, which resembled very much a New England stream, except for the different character of the vegetation which lined its sides. There were mangrove trees, with their branching roots ; cactus, some resembling huge cucumbers joined together, and others tree-shaped, 8 and 10 ft. high. Several great blue herons peered at us from their nests in the tops of the mangroves, while the dignified-looking pelicans swam around us in small bunches. A sail of a few more miles, and we reached a long sand-beach, where we stopped to lunch. A group of seals, the largest seen thus far, furnished a good scene for a picture. Soon after landing one of the sailors and myself went into the interior on a dove hunt, and managed to secure fourteen ; they were not very plentiful at this end of the island. On our return the mate cooked the doves, the rest of the luncheon was got out, and dinner began, every one enjoying it immensely. At about 3 p.m. the boat was shoved off again, and we set sail for home. It was cold and wet work getting back, this disagreeable part lasting nearly four hours ; but arriving at last, a fine hot supper completed the day.

Sept. 4.—Left Conway Bay at 9 a.m., and started over to **Duncan**. Harris went ashore on Duncan in the afternoon. Reported birds quite scarce. They could find no anchorage.

Sept. 5.—A very busy Sunday. Immediately after breakfast Harris, Hull, and myself set out to visit a crater on (or near) the top of Duncan. On landing we proceeded in different directions, so as to cover as much ground as possible. Sparrows were plentiful—I shot a good many ; also two species of *Camarhynchus* and a *Certhidea*. After a long walk I arrived at the edge of the crater at about 11 a.m. Harris was already inside. We climbed down the side, I should say 250 feet, and reached the bottom, which was level and covered all around with thick bushes on the border. Grass, 2 feet high or more, covered the entire centre. *Geospiza*, *Certhidea*, and *Camarhynchus* were abundant, and occasionally *Pyrocephalus* and *Myiarchus* were seen. Soon after reaching the bottom I heard Harris calling out that he had caught a tortoise. Hull and myself got there as soon as

possible, and we tied the tortoise up. The grass was full of tortoise trails, and we set out in search of others. Harris found two more, and Hull and myself each two. We turned them all over, and weighted them down with heavy rocks. After fixing the last one, we revisited the first and found it loose. This made it necessary to revisit the others, which we did, finding that they had all got loose. We weighted them down again with more and heavier rocks, and returned to the starting-place. Some of the tortoise which we found feeding were eating the blossoms from a creeping vine, rising upon their forelegs and stretching their necks out to full extent. The odour from them reminded me very much of that from an elephant. After tramping about so much and lifting so many heavy rocks, we were very tired, but had to brace up and climb out of the crater, and walk to the shore over a long distance of broken rock. The crater was quite $\frac{3}{4}$ mile in diameter, with a very flat bottom, surrounded by a high wall or embankment, making it resemble greatly pictures of the old Roman amphitheatres. Arrived on board at 6.30, very tired and very thirsty.

Sept. 6.—Sailed back to our anchorage in Conway Bay last night and laid here all day. Skinned birds and fixed things up.



DUNCAN ISLAND, SHOWING WHERE THE TORTOISES WERE FOUND.

Sept. 7.—Another hard day's work. Got up at 4.45 a.m. and started to heave up anchor. Sailed over to Duncan Island. Had breakfast at 6.30, and went ashore soon after, starting immediately up to the crater, with poles, ropes, etc., to get the tortoise out. Managed to recover our tortoises of last Sunday, some of which had got away. Found one dead, a rock having fallen on his neck during his strugglcs and shut off his wind. Found one more, making a total of eight. The work of making them fast lasted till about 2 o'clock, when we started for the shore with a tortoise strung on a pole between each two men, one of the sailors and myself taking one. It was very hard getting them up the side of the crater, walking being so rough and thorns so plentiful. But this was nothing to be compared with going down on the other side, which was very steep and **terrible** walking. The sailor had on a pair of wooden clogs, which soon began to chafe his feet. After a long time spent in tumbling over lava blocks, tearing through thorn bushes and other such pleasantries, we reached a point as near the shore as we could, tied the creatures up securely, and left them. Now came a long walk before we could get to the skiff. We were all so tired, having had nothing to eat since breakfast, that the distance seemed terribly long. It was a rough road, up and down, over broken lava and through thorns. Reached the skiff about 6 p.m., every one being well tired out. A good drink of wine and water was served with the lunch that was in the boat. We

got aboard the schooner a little later. This was the hardest day's work thus far, with the possible exception of last Sunday's. The trip was very hard on the tortoise also, and they acted as if " played out." Two of them being set down close together got their poles somewhat tangled up, and by the way they opened their mouths at each other it looked as if they were going to have a fight.

Sept. 8.—We went ashore quite early, and started immediately for the crater, after looking in vain for more tortoise for a short time. The mate took a small one on his back. Harris and myself, Hull and Beck carried one swung on a pole between us, and we started for the boat by a much easier route than yesterday, and got two of them right aboard the skiff. The other one and the three brought down yesterday were tied up in a sack, one at a time, and then lowered down to the skiff from the top of a bluff 75 ft. high. Getting them into the skiff, at 4 p.m. we were aboard the schooner with six live tortoises. The small one which was found yesterday appeared to be nearly dead when visited to-day. The soil at the bottom of the crater is full of cracks in places, showing that probably during the wet season there is water there. There were several rocks with depressions in their tops, and the prints of tortoise feet near them showed that the animals probably relied on these places for their supply of water during the dry season. It rained last Sunday while we were in the crater, and in one of these holes quite a little water had collected. Beck knocked over a penguin with the boathook, and we got the bird on board in a lively condition. He could walk finely, standing up on his feet, sometimes using his tail as a brace, more often not—waddling along at times quite rapidly ; he kept his wings well away from his body, and pointed down a little in advance of it.

Sept. 9.—Went ashore at about 8 a.m., or rather started at that time, it being a long pull to the island. Harris, Hull, and Beck carried the guns, while the mate and a sailor (Herman Jahnke) and myself were to bring down the two tortoises. We got into the crater at about 11 a.m. ; picked up the bones of a tortoise that had been found some time before. We saw a snake that was about $1\frac{1}{2}$ ft. long, slender and blackish, with white rings. The mate noticed it first and called me, but I only arrived in time to see it disappearing under the grass, from which we were unable to dislodge it. The mate was afraid of snakes. We ate lunch in the crater. Just as we were commencing, Harris brought in a small tortoise which had escaped last Sunday, the one first caught. The mate claimed that this one bit him while he was tying it up. After lunch we started out of the crater, a sailor and myself carrying the large dead one on a pole, and the mate the live one in a pack on his back. We got down to the bluff in good time, when we lowered them down, and then climbed down ourselves. At a little after 4 p.m. the rest of the party appeared, bringing in another dead tortoise and the small live one, the sack of bones, and some birds. Beck carried a big tortoise from the other side of the island, and reported seeing five others in a gulch on the other side of the crater, three of them being larger than any secured thus far. He said that one of the big ones was feeding on an old dead cactus. We got on board after a long pull, and started over to Conway Bay, where we anchored at 7 p.m.

Sept. 10.—Skinned birds all day ; worked on penguin in the afternoon, and think it by far the greasiest bird that I ever handled. A short-eared owl (*Asio galapagensis*) was taken in the evening. The bird came aboard and sat on the guy rope, which held the end of the foreboom, evidently prospecting for turtle meat.

Sept. 11.—Skinned the two tortoise and a hawk-billed turtle—a long and tedious job.

Sept. 12 (Sunday).—A general clearing up. Beck and Harris went over to Eden Island in the skiff ; brought back a few flowers and a couple of crabs. The two sailors killed six hawks (*Buteo galapagensis*) with pieces of rock.

Sept. 13.—Got up at 4.30, and, after having coffee, hoisted anchor and set the sails. Weather very foggy, and fine rain. We sailed over to Duncan, went ashore rather late, and all hands started at once for the crater, the idea being to work over the other side of it, and look for the tortoise that Beck had seen as well as others. We found in one of the craters (a section so thickly covered with bushes that it had not been so carefully examined) a good-sized tortoise. This find altered the plans somewhat. The mate and the sailor took the tortoise on a pole, I a sack of bones and their surplus baggage, and after eating lunch started back, the others having gone on. We reached the skiff after a long walk, the others arriving at about the same time. They reported six tortoises tied up, and the remains of another found. We got aboard the vessel about 6 p.m., and sailed for Conway Bay, coming to anchor at 7.30.

Sept. 14.—Got up at 4.30, and, after having coffee, hoisted the anchor and set sail for Duncan. We got ashore quite early, and started for the top of the island, carrying tent outfit and provisions for Beck and Hull, who were to camp in a little valley on the other side of the top. We got to their camping place after a long climb, partly through thick brush. We put up the tent and lunched. Just as we began to descend into the valley we found four tortoise, and Beck and the mate, who had separated from us a little, found three more, making thirteen in all tied up in the valley. Leaving Hull and Beck in their camp, we took the two big tortoise which the mate and Beck had found, these being the nearest to the skiff. It was terrible work carrying them. We had no shoulder pads, the carrying poles were too short, and the tortoises grew terribly heavy. We got them half-way down, and had to leave them, tying them fast. We then made the rest of the descent quite easily, and got to the vessel in time for supper. We headed for Conway Bay, anchoring shortly after 6 p.m. It was decided that the only way to get the tortoise out would be for the mate and myself to take a tent outfit and plenty of provisions and water, and join Hull and Beck on the island, the rest of the party remaining to care for the vessel at Conway Bay.

Sept. 15.—Hoisted anchor and sailed to Duncan. The mate and myself left the vessel and pulled ashore, with tent and supplies. We anchored the skiff in a splendid little bay, where hair seals, pelicans, and boobies abounded. We stored the water and surplus provisions in a cave near the shore, and made up two packs of the remainder. The sun was out in full force when we commenced the long climb to the camp, but we pressed on and reached it about 2 p.m. After a short rest we pitched the tent, and then went out and brought a good-sized tortoise to the camp. The mate prepared supper—doves, fruit, bread, butter, and coffee. It was dark very soon, and we retired early. Short-eared owls hooted about us continually during the night.

Sept. 16.—Arose at 5 a.m. and had breakfast ; then both parties started for the first station with a big tortoise. Reaching there, the mate and myself started down for the beach after water and provisions, there being only half a canteen of water to leave the others for their morning's work. We got to shore in 50 minutes, and started immediately to pack up. The mate took the five-gallon breaker of water, and I the knapsack, well loaded with canned fruit, meat, sardines, bread, sugar, butter, coffee, rice, etc., and three canteens of water. We started back

right in the heat of the day, and the mate's load soon exhausted him. We decided that I should go ahead and get to the boys with the water in the canteens, while he came on by short stages. I reached the camp about 1 p.m., very tired by the long walk in the sun. Beck and Hull had carried out three tortoises to the first station. We lunched, and later the mate reached the camp. Hull and myself got a good-sized tortoise into the camp in the afternoon (the farthest away), while Beck brought in a little one on his shoulder. A little later Beck and myself took one of the big ones around the trail to the first station, while Hull brought another little one into the camp, and the mate got several. We sat around the camp-fire awhile after supper, and then retired.

Sept. 17.—Both parties started immediately after breakfast to the first station with a big tortoise. Hull and Beck then started to work some half-way down to the shore, leaving the mate and myself to carry the remainder of those about the camp to the first station. We brought out another big one on the pole, and then each of us took a small one on our shoulders. After dinner the mate took another small one, and I the knapsack, with some extra provisions, empty jugs, etc., and went from the camp half-way down to the shore, leaving them there, as we barely had time to get back before dark.

Sept. 18.—Arose about 5 a.m., it being then quite rainy. After breakfast we got the tents, blankets, etc., packed up, and started for the shore, Beck and the mate each taking a little tortoise, while Hull and myself carried the tents, etc., all on a pole. Arrived at the shore, after quite a short rest we started up again to bring down some more tortoise. Beck and the mate went up again after dinner, bringing down two more. Meantime Hull and myself got the stuff packed up, the tortoises in the boat, and things arranged for leaving. We then took the skiff, leaving the camp outfit ashore, as we were to return on Monday. The schooner had left Conway Bay some time before, and was quite close by the island; and in a short time we were all on board with our seven tortoise. The weather at the camp on the top of the island was damp during the evening and the first part of the night. It usually started to rain at 2 to 3 a.m., and at 5, when we awoke, the whole top of the island would be covered with fog. In the middle of the day the sun made work very uncomfortable, so that we tried to do most of our work in the morning and evening. Numbers of *Geospizae* and *Nesopelia* came about the camp feeding, and occasionally a hawk appeared. Owls (*Asio*) in numbers came around during the night. Rats were quite numerous, and Beck caught several in traps.

Sept. 19 (Sunday).—Rested.

Sept. 20.—Went ashore quite early. We pitched tents and went up to the first station; brought down two tortoises half-way, ate a little lunch we had taken up with us, and took a short rest. We went up to the first station again and brought the tortoise down to the shore. The mate cooked a good supper of rice, coffee, meat (canned corn beef), and bread and butter, canned fruit for dessert. We sat around the camp fire till 8 o'clock. The seals kept up a continnal noise all night.

Sept. 21.—Had an early breakfast, and all went to the first station. The mate and myself brought a tortoise down to the camp (moved down to shore). While Hull and Beck brought one half-way and returned for another, mate and myself ate lunch, then went to half-way station and brought another one down to the shore. Meantime Beck and Hull got theirs down. It was getting late in the afternoon, so we lay off for the remainder of the day.

Sept. 22.—Got up early. After breakfast we went up to the half-way station

and brought down two tortoises ; went up again immediately and brought down two more. Had dinner and took a rest. At about 3 p.m. we went up again and brought down two more, which made the last of the twenty-nine tortoises from Duncan Island.

Sept. 23.—Did not get up quite as early. After breakfast I worked a little around the beach, turning over rocks for marine animals ; then secured several lizards. We got the eleven tortoises down on the beach. We then put six in the skiff together with the outfit. Beck steering, the mate and myself pulled to the vessel, which had come over from Conway Bay. We got aboard all right, and shortly after the rest of the tortoise and Hull were taken aboard. Then we headed off for Jervis, and anchored at the north side of the island at 5 p.m. We are doubtful if more than two or three tortoises are left on Duncan Island, because our party covered practically all the part of the island where they would be found.

Sept. 24.—Went ashore on **Jervis Island**. Fine beach, with a little lagoon right behind it, around the edge of which we found tracks of a tortoise, but were unable to find it after thoroughly searching the island. There is more soil on this island than on any visited thus far. We secured about 115 birds in all.

Sept. 25.—Skinned birds all day.

Sept. 26.—Heaving anchor in 45 fathoms of rope and chain, and setting sails. We got through before 10 o'clock, and sailed over to James Bay, **James Island**, where anchor was dropped at 1.30 p.m. Harris, the captain and mate went ashore to look for fresh water, which was marked on the chart. They returned in a couple of hours, being unable to locate any. Harris brought back a skull, a cross, knife, and pair of sandals—part of the remains of a man which he found in a cave. The skeleton was lying in a cleft in the rocks, with some brush piled up near by. A cloth was rigged up, evidently to keep the sun and wind off. The knife was stuck in the ground near by. Several walking-sticks, remains of boobies, tortoise, etc., were lying around.

Sept. 27.—Went ashore quite early. Landed at a fine sand beach. Immediately behind it was a salt-water lagoon, partly crusted with salt. Harris shot a flamingo here. Saw tracks of hogs and donkeys, also evidences of human beings having been on the island within a short time. The travelling was very fair, but a good deal of dry brush made it difficult in many places. Fair-sized trees were numerous. Found *Certhidea* and doves. Several species of *Geospiza* (quite numerous) and several species of *Camarhynchus*.

Sept. 28.—Went ashore same time as yesterday. Collected till 10.30. We saw a species of crab on the beach which roam about in large bands, evidently gathering food from the breakers as they roll up on the beach.

Sept. 29.—Beck and Harris started as soon as it was light for the interior of the island, carrying provisions, blankets, etc., thinking that they might remain over-night on shore. Hull and myself went ashore at the usual time, and collected about 15 birds each. In the afternoon the captain, mate, and steward went around the point of the island, where they found the remains of a huge camp—large enough to accommodate 30 to 40 men—evidently the camping site of some Government surveying party. They found broken crockery, an inkstand, spoon, iron hoops, etc. The tent stakes—couches—were also lying around. There was one grave marked with a good-sized cross, bearing initials which could not be deciphered by them. Harris and Beck returned to the beach just at dark, and were at once brought aboard. They had penetrated six or seven miles into the interior, which they pronounced a

thick tropical jungle. They saw a couple of fine donkeys and about a dozen pigs; the latter being very common. The trees at first were large and covered entirely with moss. Farther on they were umbrella-shape, covered with moss and orchids, and so interlaced with vines, etc., that it was impossible to force a passage through them. They proceeded here along a donkey and pig trail, which led to fresh water. They found several muddy pools where the pigs came to wallow, and the whole country was so damp that they could not light a fire. Beck killed a small pig and brought back the hind quarters.

Sept. 30.—Skinned a few birds that Beck and Harris had brought along, then got up anchor and headed for Sullivan Bay (James); wind being very light.

Oct. 1.—Vessel in about the same position as yesterday, there being no wind. In the evening quite a breeze sprang up, and we sailed along nicely.

Oct. 2.—Arrived at Sullivan Bay early in the morning. A more **barren place could scarcely be imagined.** Hardly anything was to be seen except rough bare lava. The vessel lay-to while we went ashore. We got into a little green patch and collected about forty birds, which were in very poor plumage, due to moulting in part.

Oct. 3.—There was a good breeze in the morning, and we beat along the N.E. end of **Indefatigable Island**, making short tacks; looking for the Puerta-de-l'Aguada, which was put down as being somewhere on this end. We came to anchor on the Gordon Rocks, on the east end of the island, in 15 fathoms of water, about 3 p.m. While coming to this anchorage we sighted a small boat with men in it near the shore, and it caused considerable excitement—they being the first we had seen in **four months.** As soon as things were fixed on board the skiff was got out, and Harris, Hull and myself went over to find the little craft, which had disappeared behind a small island near the mainland. It soon reappeared, and we saw it contained three men. We got alongside in a few minutes, and in response to our query, "Speak English?" one replied, "I used to"; and we saw that he was an Englishman. He said that his name was Thomas Levick; that he had lived on the islands for **29 years**, and now belonged to a small colony which had been started two months since on Charles, or, as **he called it, Florianna Island**. He was now on a short trip among the islands; had been out 17 days, and was to start back for Charles almost immediately. With him were two men: one an old Portuguese, who could speak some English, and the other a South American. We invited them aboard. It was readily accepted, and we all had supper during the evening. Mr. Levick gave us the following information. "Terrapin or tortoise were **extremely** common on the southern end of Albemarle, and there had been some on Indefatigable, James, Abingdon, and Duncan; but they had been about exterminated on all these islands. That dogs, fierce and large, were abundant on James, Chatham and Indefatigable. That there was a large fresh-water lake, and that limes, plantain and other fruit grew on the high mountains in the centre of Indefatigable. That Barrington was infested with goats. That Charles Island, the finest of the group, had for a long time been uninhabited, on account of a certain old Spaniard having been killed there by convicts. It possessed fresh water, pigs, cattle, donkeys, fruit, etc., and was going to be rapidly colonised. That Chatham had a large plantation of sugar cane and refineries for its manufacture. That the population of Chatham consisted mostly of convicts, but that the soldiers there kept them in check. That the watering-place was on the S.E. end instead of the N.E. end of Indefatigable." (We tasted some of the water that came from there, and it

was quite brackish). He also said that the absence of iguanas on Indefatigable and James Islands was due to the wild dogs, which came down to the shores to eat them, as they also do the turtle and young tortoise. Their boat was made fast to our stern, and after 8 o'clock we turned in.

Oct. 4.—Had breakfast quite early, at which our visitors joined us ; and then each party got into their boat and left the schooner, sailing in different directions. We landed at a point quite near, and then collected. The country was very rocky ; a great deal of brush quite green. Birds were numerous, but poor in plumage. Altogether there were taken 35 that could be saved. In the afternoon we got under way for **Barrington Island**.

Oct. 5.—Came to an anchorage on the N.E. side of Barrington. After dinner we went ashore on a goat hunt. Found a good trail and fair walking. Went about three miles inland, finding a number of goats, and killed three. Cut off their hind quarters and brought them down. Noticed for the first time the large land iguanas (*Conolophus subcristatus*) which live in holes. Killed one large one, which was a dirty white colour. Birds **not** numerous ; noticed small sandpipers, turnstones, swallows, *Certhidea*, mocking birds, and two species of *Geospiza*. There were the remains of quite a large camp on the beach, around which were scattered the remains of iguanas, goats, and seals.

Oct. 6.—Went ashore quite early after birds. Found *Certhidea* quite plentiful. Beck brought in several iguanas, and said that he had 24 more up in the hills, a short way off. After dinner we skinned birds, while Beck, the mate, and a sailor brought down the rest of the iguanas. The iguanas run as long as 4 ft., and some weigh about 10 lb. He found these specimens all in one colony, two and sometimes three in one hole. The holes varied considerably in depth and character—some 1 or 2 feet deep, others running underground 10 feet or so, and then slanting down, say, 5 feet. Several of the *females* contained eggs, which were larger than hens' eggs in size. The burrows were in a sandy soil. I examined two stomachs : they contained vegetable matter. They tried to bite when caught. The usual method of collecting was to take hold of the tail, pull them out of the hole, and knock them on the head quickly with a stick.

Oct. 7.—Breakfast at 6. Soon after, Harris, Hull and Beck started for the shore, leaving me to fix alcohol and skin some 30 iguanas taken yesterday. Finished, say, a dozen or more when the party returned with a snipe, rat, several lizards, and some birds. After dinner resumed work on the iguanas, finishing by 4 p.m. **Out of the 30 only 5 are males.** Of the remainder one-half contained eggs, varying in number from 8 to 15 ; white in colour. Examined most stomachs, finding vegetable matter, principally **cactus.**

We had some iguanas and the eggs for supper. They were rather tough, but tasted good. The eggs were all yolk, and like the hen's in taste.

Oct. 8.—Went ashore early, and started immediately for the "iguana village." Caught 10, which we kept alive, and brought down some dead ones. They opened their jaws savagely when seized by the tail, but were unable to bend their bodies sufficiently to bite the holder's hand. We went on board for dinner, after which we skinned the iguanas, and also some gulls and a booby. At about 4 p.m. hove anchor, and got under way for Chatham Island by supper time. Out of the last lot of iguanas **only 2 were males**, making only 7 *males* in all.

Oct. 9.—Reached an anchorage in Wreck Bay, **Chatham Island**, about noon Near to us lay another vessel, a Columbian, whose captain was accompanied by

several island officials. The police commissioner and the lighthouse keeper soon boarded us. The former brought a package of letters. The guests were entertained in our little cabin. The Ecuadorian captain could speak English, and he gave us quite a lot of information about the island. It seems that the past week was a holiday time for them, and that they are going to have a big time to-night. Harris, Hull, and the captain went up with these people to Señor Cobos' place. The mate and myself went ashore. The lighthouse keeper, a young Spaniard, and his comrade, had a house built of bamboo mats and tin combined. They had a couple of old-fashioned rifles and some "machetes." They could not speak English (nor we Spanish), but we managed to talk all the same—by sign language! The keeper showed us round. There was a graveyard near the beach; all graves were marked by crosses. There were a couple of good-sized warehouses, and that was about all. We saw several natives, one a woman, who was quite good-looking. We noticed a good many empty shells of *Chiton*, and found out that they eat the animal.

Oct. 10.—Sunday. Dressed up in our best and went ashore. The mate, Beck, and myself walked up to Progresso over a very good road. Birds were numerous, especially *Geospizae*. We noticed martins, cuckoos, *Pyrocephalus*, and *Camarhynchus*. As we neared the settlement we came to vast fields of sugar-cane. Later on we learned that Cobos had over 1000 acres planted. Vegetation tropical. Large cacti, lemon, orange, and banana trees. The tropical fruit which they call "papaios" * and castor oil beans were also common. There are some other tropical fruits here. One they call y-yava consists of a large pod, with eight or nine beans or seeds in it, surrounded by a pleasant-tasting pulp. Coffee and a tropical substitute for potatoes grow here. We soon reached the settlement, which consisted of a number of low thatched huts, which were filled with natives. It being a holiday—having nothing to do—they came around us in crowds. They were a general mixture of Columbians, Ecuadorians, Peruvians, Spaniards, etc., and crosses between the entire lot. A few of the women were fair-looking, also the Spanish boys, but the rest were a hard-looking crowd. As near as we could find out, the population was 225 men and 40 women, all of them virtually subjects of Señor Manuel I. Cobos. Saw a pen with several *Galapagos* (tortoises) in it alive. Bananas, 20 cents a bunch; lemons, 10 cents per 100; "yuccas" (potato substitutes), 1 cent per lb; water, 5 dollars per 500 gallons. There was quite a large sugar refinery here, and huge vats of sugar and juice standing around. One man said they turned out 3 tons a day. There were a good many hens in the village, and I saw one turkey. Donkeys were plentiful, and out in the green fields were a large number of cattle. We returned at noon to the ship.

Oct. 11.—Went ashore early, and shot about a dozen birds each. Cobos came to dinner, an hour late, accompanied by a bodyguard of one soldier. He left shortly after dinner, Harris and Hull going back with him. Beck and myself finished the rest of the birds.

Oct. 12.—Beck and myself went ashore quite early, shooting about a dozen birds each. Just as we got through, Harris and Hull came down the road. They had collected quite a number of nice birds, swallows (our barn swallow), cuckoos, martins (*Progne modesta*), sandpipers, and some *Pyrocephalus*. Worked on birds the rest of the day.

Oct. 13.—Hull and Beck went collecting; I worked on alcoholic stuff. On their

* *Carica papaya.*

return we all worked, and put up about 50 birds—mocking birds, finches, and several *Camarhynchus*, *Pyrocephalus*, and *Certhidea*.

Oct. 14.—Breakfast early, and then all four started for the ranche of Señor Cobos on foot. There was some misunderstanding about horses, and we found that we could not get away till noon, so we accepted his earnest invitation to breakfast, and then set out to see his coffee plantation. Our trip took us through long groves of banana trees and other tropical fruits. The scenery was beautiful: large green trees, tropical vines and plants, little pools of water—all of which, combined, fulfilled my idea of a tropical paradise. Black *Camarhynchi* and *Pyrocephalus* were abundant here; *Certhidea* also quite common. There were big flocks of turnstone on the pasture lands. We got back in time for the 11-o'clock breakfast. Had a very good meal, with the best chocolate that I ever tasted. We noticed them making rope of the threads of a kind of cactus which grew about the place. *Progne* were numerous about the house. After breakfast we got the horses, and in company with a nephew of Cobos and his book-keeper we started for the top of the island. The land was all open, and looked like good soil. It was a rather up-and-down ride, but we reached the big **fresh-water lake**, in the bottom of an old crater. It was so foggy that we could not see over 50 yards. They said it was half a mile in diameter. There was a flock of teal on it. We heard a curlew and a plover on the way up. We rode around the lake, and on our return had supper with Cobos, returning to the vessel after dark. It was very dark, but we found the shore and then the vessel, and were soon aboard.

Oct. 15.—Awoke very sore, the result of yesterday's riding! Hull, Beck, and myself made up 40 birds secured yesterday. Water, "yuccas," and bananas were brought aboard.

Oct. 16.—Hull, Beck, and myself went ashore early, and got 20 birds each. Beck got a dove and a *female* bobolink (*Dolichonyx oryzivorus*). The dove was the only one seen on this island by us, and the first bobolink recorded for the group since Darwin's visit. We went on board before dinner, and had the birds put up by supper-time. We gave our mail to Captain Barnhoff to post in Guyaquil.

Oct. 17.—Harris started up to the hacienda of Señor Cobos about 5 a.m., to see about water, and returned shortly after dinner in company with Cobos, his nephew, and another gentleman. They remained a short time, and then all but Cobos were put aboard the other vessel bound for Guyaquil. They immediately weighed anchor and sailed. After putting Cobos ashore we did the same.

Oct. 18.—There had been no wind during the night, and the strong current had taken us off the island so far that all day was spent in getting back.

Oct. 19.—Vessel lay to on the north side of the island. We went ashore at 7.30, and started collecting. Birds not numerous, and mostly *Geospizae*. Two species of *Camarhynchus* were taken. Beck and myself each got a *Certhidea*. A few *Nesomimus* were taken at a little pool near the shore. Five or six martins were taken. Boobies were very plentiful. We noticed some nesting. One nest contained two eggs badly incubated. I say nest, but there was no nest, the two chalky eggs being laid on the bare ground. Very hot in the middle of the day.

Oct. 20.—At sea; the weather about the same. Up to noon we made very little progress, but came in sight of Hood Island at supper-time.

Oct. 22.—Got up early. The vessel was within 5 or 6 miles of Hood Island. We got to work on the tortoise, and had it finished before dinner. The vessel came to anchor in Gardiner Bay, **Hood Island**, at 10.30 a.m. After dinner we went up to

the top of the island on an inspection tour. The country nearly all rocks, covered with dry vegetation—quite thick in places. Huge lizards were abundant, and a number were taken. We got two snakes, the largest about 3 ft. long. Birds not numerous, and many in very worn plumage. I saw *Certhidea*, mocking-birds, and three species of *Geospiza*. One hawk was seen. Doves very numerous. We collected several black tern, and the sailors killed a yellow-crowned night heron (*Nyctanassa*). Beck brought back two goats from a flock of twenty that he saw.

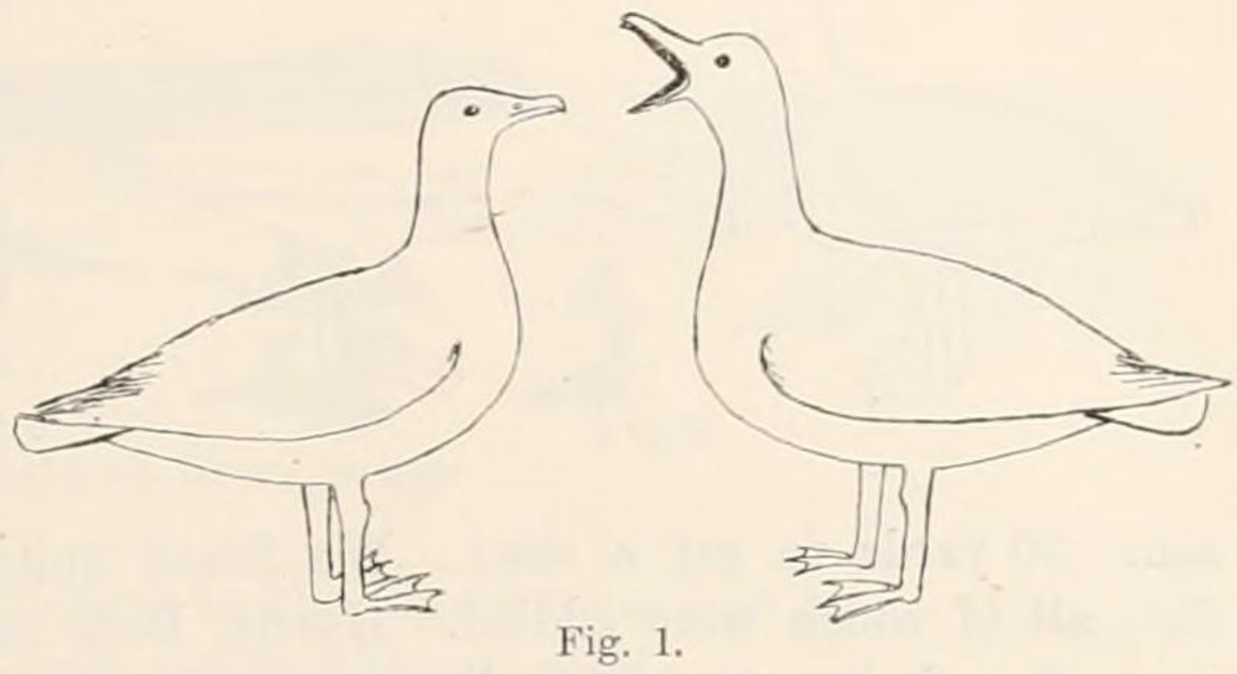


Fig. 1.

Oct. 23.—Went ashore early after birds. Returned at 11 a.m. with about 50 small birds, two hawks, several oyster-catchers, a booby, sanderling, gull, and a lot of lizards; also several black iguanas. We skinned all the birds before supper, with the exception of the two hawks, it getting too dark to work. In the evening several short-eared owls came out to see us, and I knocked one down with the spreader of the yawl-boat.

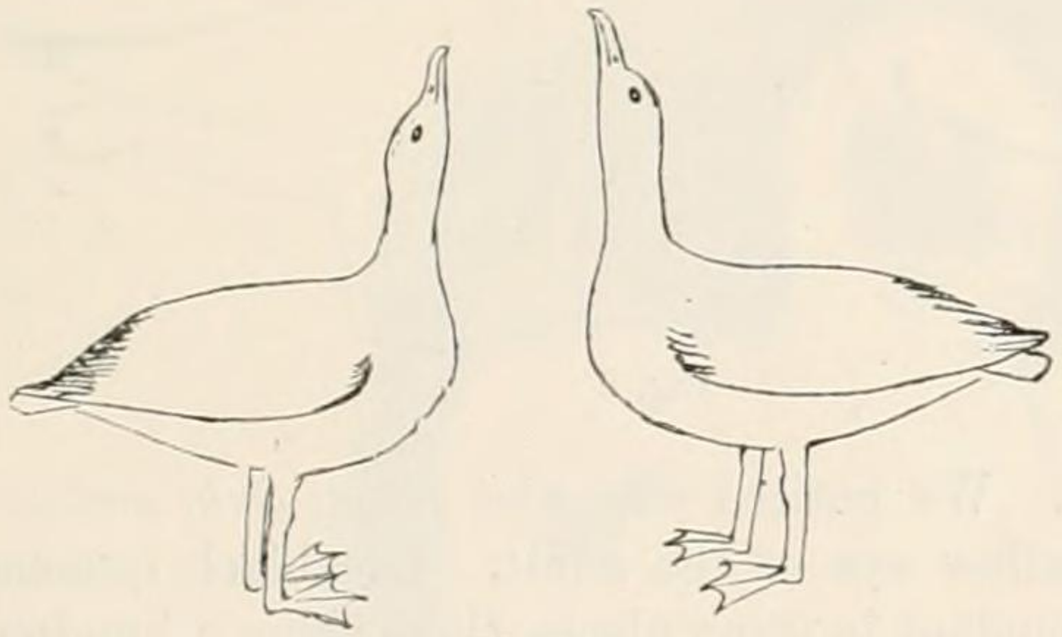


Fig. 2.

Oct. 24 (Sunday).—Skinned a hawk before breakfast, after which Hull finished the other. I skinned the owl, spent another hour in fixing up things, and took a vacation the rest of the day. I fed one of the tortoises with banana peel, which it took from my hands.

Oct. 25.—Shot 20 birds each, and returned at 9.30 a.m. We skinned birds all the rest of the day. In the afternoon the mate and sailors went off on a goat hunt, but found no goats. They reported, however, a big albatross' rookery, and brought in several eggs of the albatross.

Oct. 26.—Up early and started for the rookery. We separated after going inland for some distance, the mate and a sailor after a goat, and the rest of us for albatross. We reached the first lot soon. They were a mile or more inland, on a smooth patch of ground. Some of the groups contained a dozen or more individuals. They were very tame, like the boobies, but some attacked us in a savage manner. We noticed a very curious and interesting habit which seemed to be a pastime of theirs, and resembled fencing as near as birds could imitate it—their beaks being the foils (Figs. 1 to 6). In every direction birds were fencing in pairs.

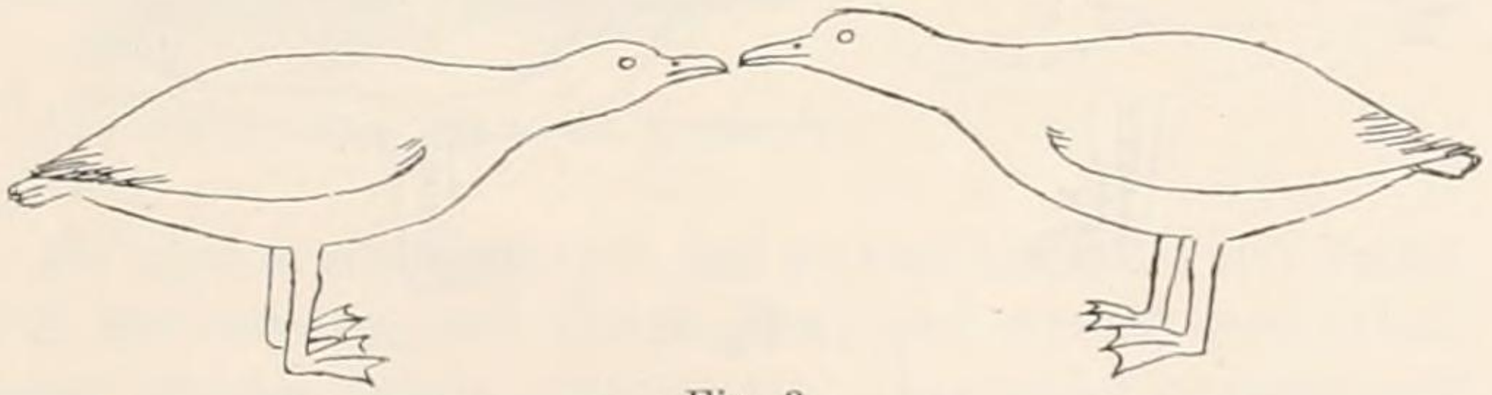


Fig. 3.

They would stand opposite each other, and throw their heads up in the air (Fig. 2); then make two or three preliminary bows and parries, and after fencing a minute or less, one would throw up its head and utter a note with his bill wide open (Fig. 1), and then assume the first position again. The other would follow the example, and the same performance would thus be gone through with many times. The eyebrows are very prominent on these birds, also their breasts. Their walk is a peculiar waddle, like the "swagger" of a "bowery tough." We found the rookeries scattered all around—some near the shore, others well inland. Before flying they had to run some 30 yards to get a start. We found quite a number of eggs during the day, all of which were addled. Harris, Beck and myself left Hull and a sailor soon after finding the first albatross, and started for the S.E. end of the island. Albatross were scattered all along the route, there evidently being several thousands of them on the island.

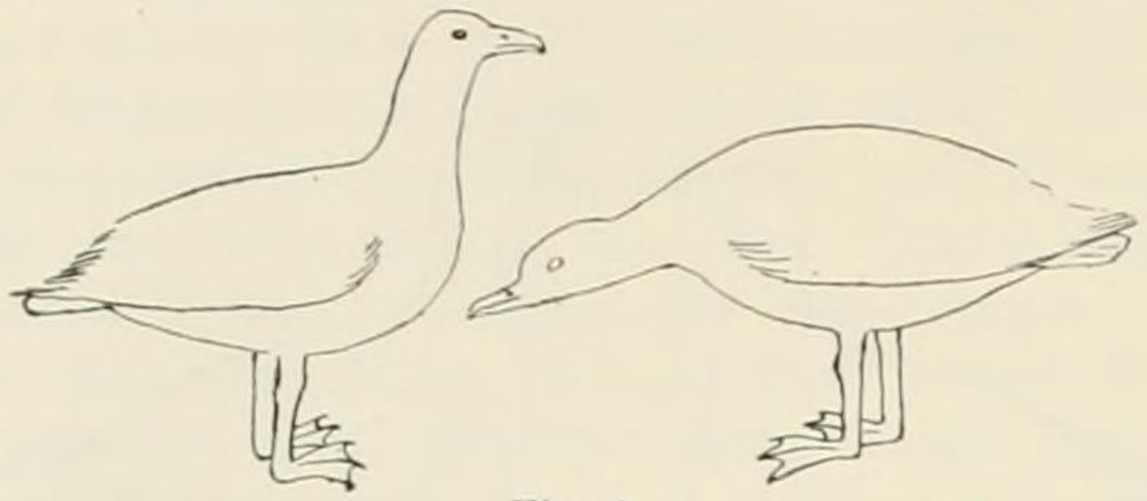


Fig. 4.

On reaching the S.E. end we found sea-birds very abundant: gulls (*Creagrus*) were "thick"; frigate birds extremely abundant and breeding; boobies; yellow-crowned night herons, and the little blue herons (*Butorides*); black terns; and tropic birds which were nesting in the rocks. We noticed that the young *Sula nebouxi* had dark brown eyes instead of the yellow eye of the adult. The black iguanas (*Amblyrhynchus cristatus*) were very abundant in some places, there being a hundred in a square yard (see Plate V., right-hand lower corner). We ate lunch here, and then started back along the shore for the vessel.

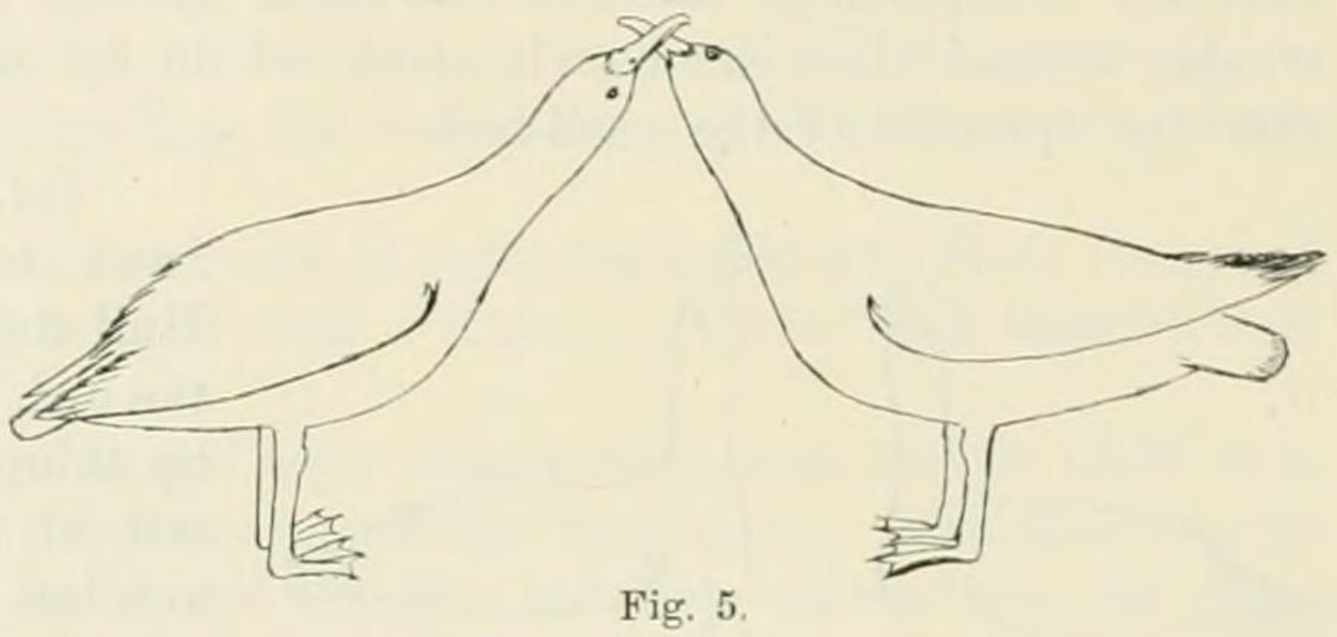


Fig. 5.

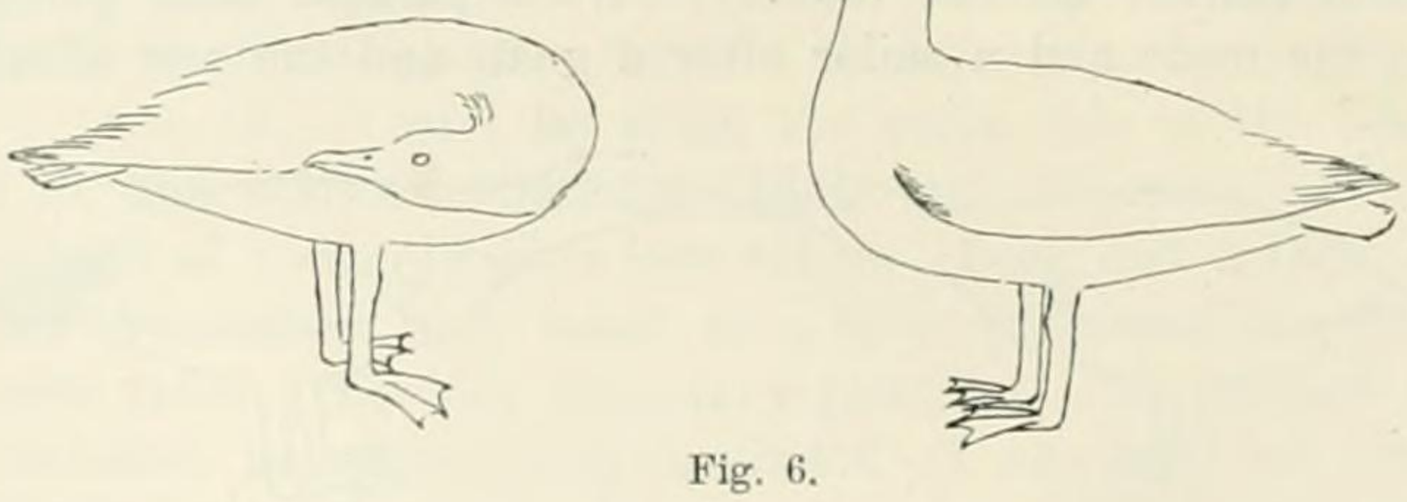
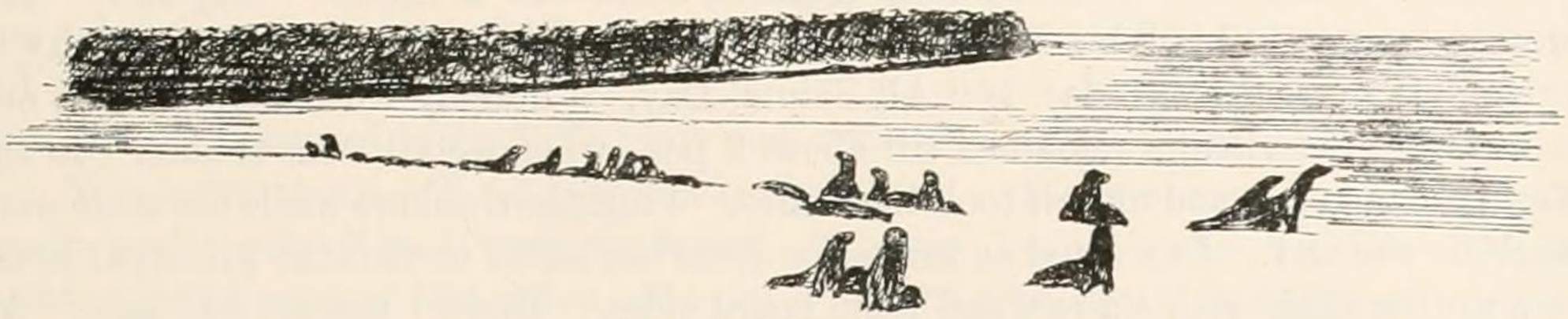


Fig. 6.

Oct. 27.—Skinned birds all day, putting up 16 albatross, 4 tropics, and an owl; also blew a few of the albatross' eggs. The albatrosses were very fat.

Oct. 28.—All hands except the captain and cook took the skiff and went towards the E. end of the island, bound on a big bird hunt; landed at a point about two miles up shore, and dragged the boat out high and dry. Then we started across to the S.E. shore, and there commenced to collect. Shot several oyster-catchers and yellow-crowned night heron. Beck caught a number of red-billed tropic birds among the

rocks, some of which had eggs. After lunch started back along the shore, taking in tropic birds all the time, and at one point laying in a number of *Creagrus*. By the time that the skiff was reached we had some 50 birds and a lot of eggs—the eggs being two species of booby, albatross, tropic birds and gulls. There was a big surf running on the S.E. side, which looked magnificent. The heavy rollers would dash against the rocks, sending the spray 50 or more feet into the air. Had quite a time

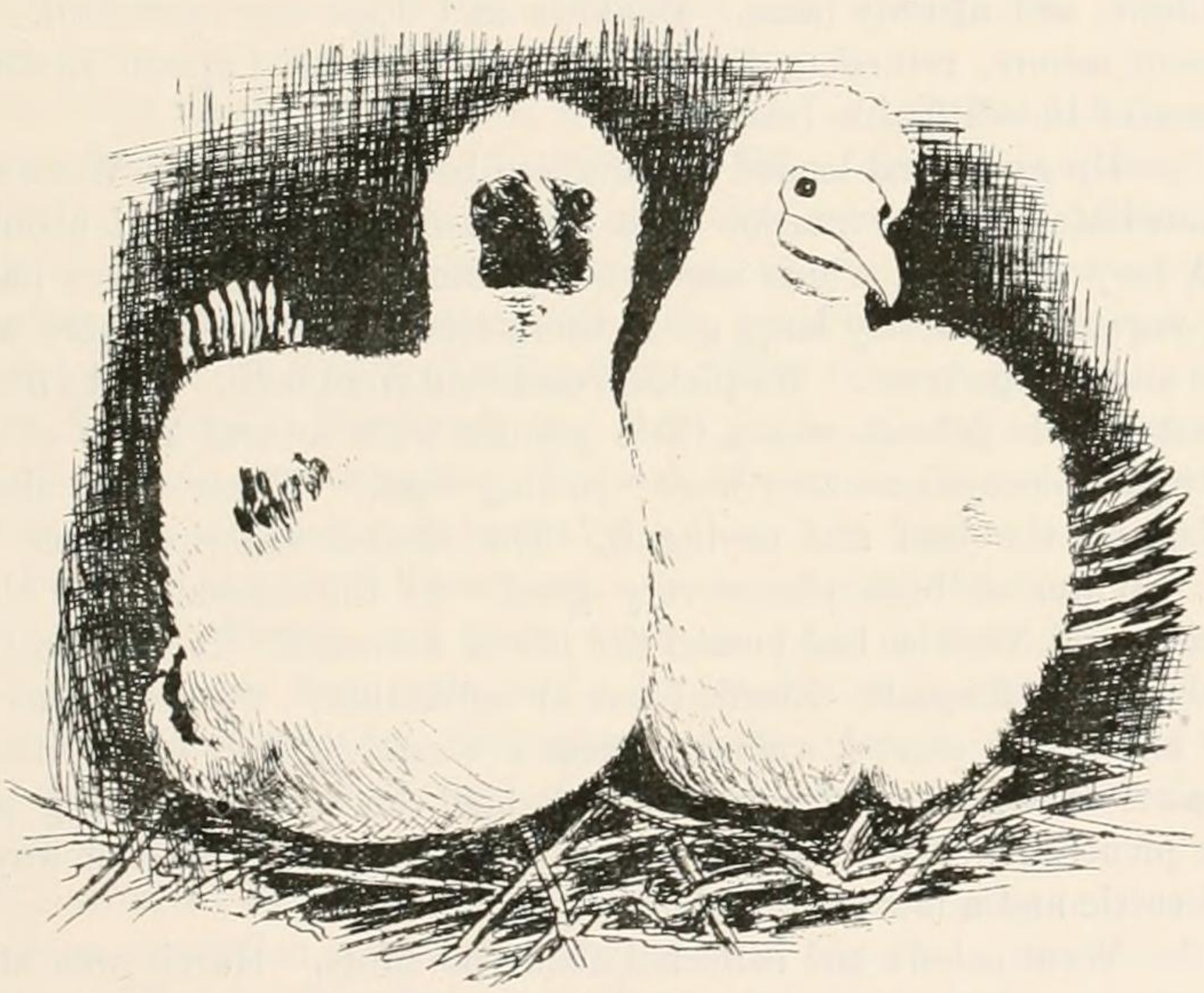


SEALS ON HOOD ISLAND.

getting the boat launched, but got back to the vessel by supper time. Had some quarrels with the sailors, but the mate subdued them quickly.

Oct. 29.—Skinned birds all day, putting up all the large ones secured yesterday.

Oct. 30.—Blew eggs most of the day, and at 4 p.m. we hoisted anchor and left Hood Island; headed for Gardner Bay.



YOUNG OF SULA PISCATRIX WEBSTERI.

Oct. 31 (Sunday).—No wind during the night, and we were ten miles off Charles. There was a little wind in the morning, and Harris, Hull and myself went ashore on **Gardner's Island, near Charles Island,** after dinner. The island is quite small—about two miles in circumference; it is high, and for the most part its sides are steep, perpendicular cliffs. We found one place where we could get up, and this was none too easy—quite a steep climb over slippery glazed rocks. On top the soil was a coarse gravel, and covered thickly with bushes and cactus. Birds were not plentiful, but we obtained about 50. Several *Geospizae*, *Myiarchus*, *Dendroica*,

Nesopelia, *Camarhynchus* and *Nesomimus trifasciatus!* The latter were quite plentiful. Sea birds were abundant, some of them breeding. Saw frigate birds, black tern, boobies, tropic birds, *Puffinus*, *Aestrelata*, and petrels.

Nov. 1.—Made anchorage at **Charles Island** about 10 a.m. Harris and the captain went ashore at once, returning at dinner time, bringing quite a boat-load of people, including M'Gill, who has charge of the colony, two overseers, and four señoritas. Soon after M'Gill's son, Antonio, came out in a little "dug-out." The women were very kind, but naturally very inquisitive. Our bread was a novelty to them. It seems that to-day is "All Saints' Day," a holiday with them, and no one working. The visitors remained till about 2 p.m., when we all went ashore. In the first boat the mate and myself took the ladies. I remained ashore while the mate went back for the rest. I accepted an invitation from the ladies to visit the principal house —a square affair with tin roof and plain board sides. There I met several men. All hands joined in trying to entertain me, and, considering my ignorance of Spanish and theirs of English, they succeeded well. Soon after the other boat-load was landed, and we were entertained in fine style by M'Gill. There were several "shanties" in this settlement, all of the same character, "square affairs with tin roofs." There was much dried beef and fish stored away. Had some oranges, the first seen since leaving San Francisco. Here was a pen with some 40 tortoises, a number of them in good condition. They had some young flamingoes, caught the previous night, and already tame. Donkeys and dogs were plentiful. We spent the afternoon ashore, returning in time for supper with Captain Levick, our old acquaintance of Indefatigable Island.

Nov. 3.—Up early, and loaded ammunition before breakfast. Went ashore, and started immediately for the interior with Levick for guide. Went about six miles inland. A very fair road, which narrowed in some places to a mere path. There was much vegetation, mostly large green thorn trees. Higher up there were a good many lime and orange trees. We picked some fruit from both. At the first watering place, about a mile inland, was a little garden with several kinds of vegetables. Here also was a place where they were "jerking beef." There were about a dozen men cutting up the beef and drying it. The second watering place was much higher up. Water at both places very good. At the second place there was a cave where an old Yankee had passed the life of a hermit. It was nicely fitted up, seats, shelves, and fireplace chiselled out of solid rock. *Pyrocephalus* were very abundant about this second watering place; *Camarhynchus* also quite plentiful, and *Geospizae* abundant all the way up. Around the second watering place water birds were plentiful—curlew, ringed plover, and turnstone. On the way back saw some wild cattle and a few wild donkeys.

Nov. 3.—Went ashore and collected about 60 birds. Harris was attending to arrangements for entertaining some of the islanders whom we had invited to take supper with us. Arranged a table on the main deck with a tarpaulin spread overhead, with flags of America and Ecuador for drapery. The guests arrived at 4 p.m. M'Gill and son, Captain Levick, and several other gentlemen and ladies. We sat down to supper at once, and in spite of our limited means for conversation, had a very pleasant time. After supper the band (consisting of myself and my flute!) played several dirges, and I then went into the cook's galley and played for them dance music. The music and the dance did not seem to hit well, but they all enjoyed it. At 7.30, after many "buenas noches," our guests left us, inviting us to coffee with them in the morning.

Nov. 4.—Collected about 45 birds. Had them up by 2.30 p.m. Then we blew some eggs collected some time previous.

Nov. 5.—Started for the top of the island, taking lunch, intending to remain all day. Reached the summit in good time, and separated. All hands returned by 4 p.m. Hull and Beck obtained some *Certhidea*,* probably a new species. Harris secured a bobolink. I took one of the swallows that resemble the barn swallow, the third taken on this island; also four specimens of the *Camarhynchus*—the only ones taken here thus far. Beck found a nest of *Pyrocephalus* containing one egg and one young bird.

Nov. 6.—Skinned yesterday's birds and cleaned guns. Loaded cartridges, etc.

Nov. 7 (Sunday).—Went ashore after breakfast. Remained on land a couple of hours, said "adios," and went on board. Captain Levick came with us. After dinner hoisted anchor and sailed around to "Post Office Bay," and dropped anchor there, taking only an hour or so to make this change.

Nov. 8.—Went on shore early, collecting. Visited a lagoon near the shore, where it was said flamingoes could be found, but saw only one. There were a hundred or more teal in the place, also stilts, sanderlings, black-bellied plover, turnstone, yellow-crowned night heron and curlew. Captain Levick was carried back in the yawl boat.

Nov. 9.—Got up at 3.15 a.m., hoisted anchor, and sailed for **Albemarle Island**. Weather a little rough. Got over to Albemarle and anchored on the S.E. side at 2 p.m. Saw *Larus fuliginosus* flying around the vessel.

Nov. 10.—Got up at 5.30 a.m. and went ashore. Landed in a little cove where a fresh-water stream entered into the ocean. The *Larus fuliginosus* were very numerous about this place. The banks of the stream were lined with a thick growth of mangroves. Among these trees were a large number of yellow-crowned night herons (*Nyctanassa violacea*). Saw several of the great blue herons (*Ardea herodias*), one of which we shot. It was very difficult travelling through the brush, and we did not get very far inland. The brush was thick, and so interlaced with vines and thorns as to be almost impenetrable. Secured *Myiarchus magnirostris*, *Nesomimus parvulus*, *Certhidea olivacea*, and several species of *Camarhynchus* and *Geospiza*. Harris and Beck killed several flamingoes. Beck secured a *Gallinula*.

Nov. 11.—Hull, Harris, and Beck went on shore collecting. I remained on board, and skinned three flamingoes and some herons left over from yesterday. At noon the party returned with two flamingoes, a white egret, herons, gulls, etc., which we skinned in the afternoon. They also brought in an immense black iguana, measuring 49·50 in. from tip to tip.

Nov. 12.—Started early to penetrate into the interior, hoping to go as far as the growth of green vegetation. Beck and myself went together; he carried a gun and I the machete. We landed a little to the west of our usual place, and started out N.W. We got into such a thick growth of brush near the shore that we were unable to get through it, and had to back out and go to the west, where it was better. All the way, as far as we went, the character of the ground was about the same for the most part—rocky, with little ridges and valleys. Occasionally we met little patches of a few hundred yards where the walking would be very fair. We found tortoise and cattle trails quite numerous, and by means of these and the machete we made good progress. The vegetation changed gradually the higher up we advanced; taller trees and more green bushes appeared. We got several miles inland (estimate

* It is a new form, *Certhidea olivacea ridgwayi* nobis.

5 to 7), and ate lunch on the top of the only hill near. Around the base of this hill the vegetation was quite tropical—green and thick brush, trees covered with long hanging moss, and long creepers hanging down from their tops and interlacing the whole. After lunch we went over the hill on the north side to the edge of some green trees. There were two kinds of trees, one with a long narrow pointed leaf, the other with a leaf smaller and broader. The former was very dark green in colour, and the other a light green. There was considerable soil here, and a cattle trail going through. We saw but one bunch of cattle, which ran by us on our way up. We were delayed a great deal by our tortoise investigations, and it was quite late when we started back. Beck carried the gun, machete, and a bag of tortoise eggs. I had a live tortoise (perhaps 15 lb.) in one hand and a basket of tortoise eggs and birds in the other, and a lot of tortoise eggs tied up in my undershirt over my shoulder. We started back at a lively pace, and by the time that we got within a mile or less of the shore it became necessary to increase it still more in order to reach the shore before dark. The ground was covered with long creeping vines, which every step would catch about the feet and trip us. In spite of this we reached a point within a few hundred yards of the shore in fair time. There our trouble commenced. We got into a thick patch of green vegetation, which in our tired condition it was almost impossible to get through; but we finally reached the edge of the mangroves, where we expected to find a path, but we were sadly mistaken: when at the very edge of the mangroves, we were walking ten feet above the ground, supported by the matted brush. By this time we could hear the rest of the party in the skiff not far off, and we tried to go through the mangroves to meet them. We finally did so, by wading through the water up to our hips, and by climbing over the mangrove roots ten feet high—a very ticklish travelling after dark! Once more aboard, a change of clothes made life more comfortable. To-day some information was obtained in regard to the breeding of the tortoise. The interest of R. H. Beck and myself was first aroused by finding considerable quantities of broken eggshells scattered around about a small hole in the ground, as if they had been dug up and the contents eaten by some animal—probably dogs. Mr. Beck found the first fresh nest. It was situated in a little patch of dirt at the foot of a rocky bluff, and contained eight eggs. After this several such nests were found, containing eight to twelve, and in one instance seventeen eggs, nine or ten being the usual number. With one or two exceptions, the eggs were deposited in well-beaten cattle trails, sheltered from the direct heat of the sun by the thick vegetation on both sides. There were slight signs of the holes; a very slight rise from the surrounding level, and a somewhat fresher look to the dirt, was all that distinguished them. They were about a foot in width and depth, and were round in shape. The dirt immediately around the eggs was soft, but the upper crust, of 3 or 4 in., was extremely hard, as though matted down by some heavy weight, perhaps the body of the tortoise. The eggs were laid in layers, and closely together; from 3 to 5 eggs comprised a layer, which was separated from the next by a lining of dirt. All eggs secured were fresh. It is very possible, although not certain, that one tortoise lays in several holes. The finding of 4 or 5 holes within the radius of 10 ft. or so in many instances leads to the conclusion that one tortoise lays from 40 to 50 eggs, some of which thus are likely to escape the ravages of enemies. Tortoises were found in close proximity to several nests.

Nov. 13.—Remained aboard all day. Finished skinning the iguanas, and blew tortoise eggs. It was hard work blowing the eggs. We had some of

the contents saved for supper, and made into omelet. They were richer than hen's eggs.

Nov. 14.—Sunday. Took a rest. Saw a tiger shark in the morning, 8 to 10 ft. long.

Nov. 15.—Started off in the yawl boat, and went up the west shore. Obtained nine flamingoes and a few *Nesomimus*, boobies, penguins, and a few waders and hawks. We saw several white egrets, but could not get them. Returned at supper time. The flamingoes were wading in a slimy ooze. In doing so they would sink in about 6 in., up to the tarsus. When shot we had to wade into this ooze to recover them. In one case Beck got in up to the breast—a very disagreeable business. On coming out we would be covered with muck, and would have to scrape it off as best we could, there being no water near to wash in.

Nov. 16.—Skinned birds all day. Harris went off in yawl to find out about anchorage at "La Tortuga," on Albemarle Island.

Nov. 17.—Skinned several iguanas and sea turtle. Got under way in the afternoon, during which operation the kedge anchor was lost. Sailed around to La Tortuga, and came to anchor about 2 miles from here.

Nov. 18.—Went ashore near a deserted hut, where we left our surplus baggage. Soon after landing we sighted some cattle within 300 yards of the shore. Although several shots were fired, they got away. There was quite a grove of plantain trees here, and we picked several bunches of bananas. Harris and myself started inland, while Hull and Beck followed the shore, working the lagoons. There were some fair cattle trails leading inland through the brush for some distance; but these finally ceased, and we had to give it up. We started back for the shore, but got lost, and it was noon when we reached it, coming out about a mile below the hut. Found land birds very scarce, but took a few *Geospiza* and *Nesomimus*. After lunch I started down the shore, and got several teal, gulls, a heron, stilt, turnstone and sanderling. Teal were very numerous. Beck got two flamingoes and a blue heron. We left for the vessel about 3 in the afternoon. Turtle numerous and breeding here.

Nov. 19.—Up anchor at 5 a.m., but the wind died out, and as the current set on shore had to drop it again. Then we kedged her out again, using a bag of sand in place of the anchor lost. Wind starting, we headed for Iguana Bay.

Nov. 20.—Sailed up to "Iguana Cove" with a good breeze, but the captain refused to anchor there, considering it dangerous. We took the six iguanas which we brought alive from Barrington Island, and skinned them. They had apparently taken no nourishment since capture, and were gradually starving. All *females*, and contained eggs.

Nov. 21.—Sunday. Intended to go ashore and collect, but the vessel had drifted off during the night, and was becalmed 15 miles off.

Nov. 22.—Calm all day; made no progress. Hull, Beck and myself went out in the skiff and secured about 25 birds, mostly *Procellaria*.

Nov. 23.—Quite a breeze. We managed to get to Iguana Cove by dark, but not in time to work.

Nov. 24.—Wind had almost died out, and we were quite a distance off the island again. We tried to beat up to Iguana Cove, but failed, so set sail for Tagus Cove. This makes several days they have spent trying to get near enough to Iguana Cove to put off in the boat.

Nov. 25.—Quite a little wind, and we managed to get as far as the N.E. end of Narborough by night. There we were becalmed for a while—just long enough

to prevent us getting into an anchorage. The whole country was very rough-looking, mostly bare lava, with here and there a little low brush. Narborough was nearly all barren, a few patches of mangroves near the shore, and a few small patches of low, dry bushes. We hove-to for the night.

Nov. 26.—Got into Tagus Cove shortly after 1 p.m.: quite a nice little anchorage. The cove was formed by part of an old crater. Water very deep; anchorage about half-way in, 10 fathoms. We pulled along the shore in the skiff some way. We found fresh water running down the sandstone in several places; some little holes in the rocks holding 10 to 20 gallons. It is said a vessel put in here out of water, and, seeing the water oozing down, they cut the places in the rock to catch it, thus obtaining a supply. Penguins and boobies very numerous, also black terns (*Puffinus subalaris*) and small herons. Black iguanas quite plentiful. Quite a few land birds, mostly *Geospiza*.

Nov. 27.—Early ashore collecting. Hills very steep, but walking good—mostly smooth sandstone and some soil. We found land birds, except *Geospiza*, rather scarce. We got ten small birds and two hawks. We saw quite a lake right behind the cove, separated from it only by a comparatively small ridge of lava. We got back to the vessel by 10 a.m., and skinned birds all the afternoon.

Nov. 28.—Rather a busy Sunday. We got up at 4.30 a.m., and at 5 had coffee. Then we four started for the top of the mountain. We made very fair progress for the first three miles, the walking being very open. As we proceeded higher the brush thickened, and made it much slower progressing. Finally, when we got half-way up in distance, and about four-fifths in height, we made a halt. From here Beck went on to the top, where he found a huge crater, about 1000 ft. deep by 2 miles wide, mostly bare lava. The rest of us started back, taking a few birds and one small snake. No tortoise seen. We got back to the vessel in time for supper, Beck arriving later.

Nov. 29.—Skinned yesterday's birds, and loaded ammunition in the morning. In the afternoon Hull and Beck went after sea birds in the skiff, while Harris and myself went on shore. Harris intended to get some land birds. I collected some 20 lizards and large grasshoppers, a species which occurs throughout the group. I noticed a few dragon-flies, but could not catch them. Beck and Hull collected a number of black terns, shearwaters, gulls, boobies, etc. Harris had another chance at a falcon, the one which he saw and shot at two days since. Unfortunately his gun missed fire, and it escaped.

Nov. 30.—Skinned birds all the morning, doing about 40 fair-sized ones. After dinner Harris and myself went along the shore in the skiff after urchins. We found four species, all quite abundant. On the bottom, about 3 ft. under water at low tide, we found some magnificent purple urchins, with spines about 4 to 6 in. long. We found four species of star fish, and gathered a lot of sea urchins. Some 18 penguins taken later in the afternoon.

Dec. 1.—Skinned penguins all day, each of us doing six (Hull, Beck, and myself)—a long job, as the birds are incredibly fat. Wind was blowing strong in the morning, reminding us of December gales at home.

Dec. 2.—Harris, Hull, and Beck went over to the watering place, and thence inland, collecting small birds. They returned at noon with 60 birds. I remained on board and cleaned 175 or so urchins, and dried some star fish. In the afternoon skinned birds.

Dec. 3.—Skinned balance of birds, loaded ammunition, and had a general

cleaning up and packing. In the afternoon we went around Turtle Point to a sand beach, hoping to get some turtle and shore birds. We shot an oyster-catcher, which, with a green heron, some turnstone, and ringed plover, were the only birds seen. There were some small shells and sea beaver on the beach. We got two turtle from this beach. When leaving we passed another little beach, and seeing three turtle there, the mate, Beck, and myself landed on the rocks, it being too rough to go in with the boat. We brought the turtles down to where they could be hauled out to the boat with a rope. We landed on the rocks again, and farther along caught several big iguanas. Collected six boobies, five pelicans, some *Larus*, one *Creagrus*, and a few others. We noticed a large crab, of the kind most abundant here, eating a somewhat smaller one of the same species. When disturbed he took his victim in one claw, retreated quickly several feet, and resumed his meal.

Dec. 4.—Skinned birds all the morning. The pelicans skinned easily. In the afternoon Hull, Beck, and myself went off in the skiff for iguanas. There was a big surf running, and we found it hard to make a landing. We secured about ten good-sized iguanas.

Dec. 5 (Sunday).—Rested.

Dec. 6.—Up early, and started in the yawl boat for the small patch of vegetation on the north side of **Narborough Island.** Not much breeze at first, but it gradually freshened, and we made the distance, eight miles, in fair time. There was a big surf running, but we managed to make a landing. We saw several specimens of a bird, probably a **cormorant,** and secured three.* The birds were wild, and kept in close to the breakers, so that no more could be obtained. We found land birds scarce and wild. We collected a few specimens of *Geospiza*, *Nesomimus*, *Dendroica*, *Certhidea*, *Myiarchus*, *Camarhynchus*, and *Nesopelia*. Several hawks were seen. Black iguanas were common on the rocks, and we found probably a new species of land iguana, of which we collected **32 specimens.** They resembled those taken at Barrington in general character, but were **highly coloured** with different shades of red, yellow, and white.† They had holes in the gravel similar to the Barrington Island specimens. We started back at 1 p.m., picking up another cormorant.

Dec. 7.—Skinned birds all the morning, and iguanas the rest of the day. Average length of the Narborough Island species, 58·50 in. They were *females* for the most part, and considerably smaller than the *males*. Most of the *females* showed no signs of breeding; only one contained seven partly developed eggs. We saw a small bat in the evening. This was the only one seen. It appeared dark, and about the size of the common one of New England.

Dec. 8.—Skinned iguanas all day. Just as we were getting through, about 4.30 p.m., a vessel came in sight around the point, and headed up the pass between Albemarle and Narborough, which was followed by another and smaller one. They came in the cove, and were soon anchored alongside of us. They proved to be the British man-of-war *Leander* and the torpedo destroyer *Virago*.

Dec. 9.—Hull, Beck, and myself started off in the skiff after iguanas, turtle, cactus, etc., to Albemarle. We collected about 15 good-sized iguanas and some small ones. We pulled along the shore a couple of miles or so, and found a little sand beach, with several turtle on it. There was a big cucumber-cactus here also, and we laid in all that the boat would hold. It was smooth water when we landed,

* *Phalacrocorax harrisi.*

† This is evidently a new form, differing by its remarkable coloration, and may be named *Conolophus subcristatus pictus* subsp. nov.

but by the time we were ready to start it became quite rough, and we had some trouble in getting out. We returned to the vessel. In the afternoon several officers and midshipmen from the man-of-war came aboard. They had many questions to ask.

Dec. 10.—Two officers from the gunboat came aboard at 8 a.m., bringing quite a lot of books for us. Soon after the two ships headed out, taking our mail.

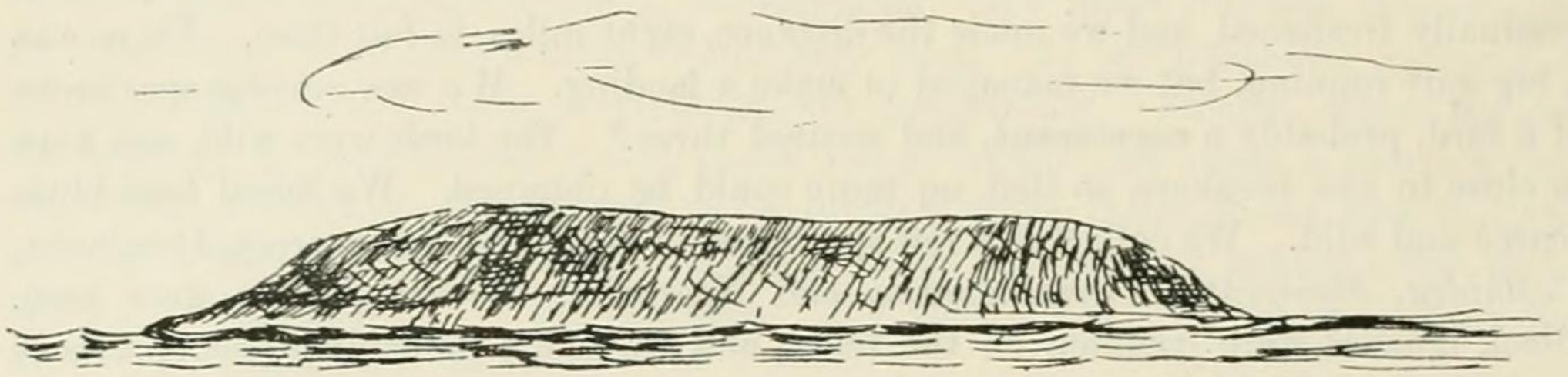
Dec. 11.—Did little else but try and get under way. The wind was light and baffling, and all our labour was to no purpose.

Dec. 12 (Sunday).—Tried again to get out of the cove, with no success. We poisoned the turtles that were skinned two days since.

Dec. 13.—Managed to get out of Tagus Cove late in the morning. We started for **Tower Island** with a fair breeze round the north end of Albemarle. We skinned a few iguanas in the afternoon : one was a *female* with eggs. The egg was spherical, about 1 in. in diameter.

Dec. 14.—Skinned iguanas all day. We sighted a vessel in the afternoon, which appeared to be making for Tagus Cove, but did not get nearer than 8 or 10 miles of her.

Dec. 15.—Skinned iguanas all day. Weather very hot.



TOWER ISLAND.

Dec. 16.—Skinned iguanas, finishing them. Weather hot ; a little breeze.

Dec. 17.—Fair breeze. We came in sight of Abingdon towards noon. Calm during the first part of the night.

Dec. 18.—Calm nearly all day. We had a little rain, the first for a long time. We packed up some stuff in the morning ; noticed three or four of the Culpepper tern around the vessel in the evening.

Dec. 19 (Sunday).—A good breeze all day. We sailed up to the north side of Abingdon Island. Bindloe was in sight the last part of the day.

Dec. 20.—Good breeze. Out of sight of land all day. At 4 p.m. Tower Island bore S.W.—68 miles.

Dec. 21.—Good breeze all day. Tower Island in sight most of the time, but could not get near it.

Dec. 22.—Condition of affairs about the same. Tower Island in sight.

Dec. 23.—Good breeze all day. Out of sight of land. A large school of porpoise came around the vessel towards the evening. The mate struck a couple, but the harpoon pulled out both times.

Dec. 24.—Some breeze all day. We found that we were quite a way south of Tower. We could see Chatham in the distance.

Dec. 25 (Christmas !)—Not much wind in the morning early. We sighted Tower Island soon after breakfast, and sailed up to it, coming to anchor at 2.30 p.m. ;

and soon after Hull, Beck, and myself went ashore after cactus for the tortoises. **Tower Island.** Noticed *Creagrus*, tropic birds, boobies, black terns, frigate birds, shearwaters, petrels, and *Larus fuliginosus*. The shore on the N.E. end is rather bold—steep bluffs and a small black sand beach. At breakfast the captain put a Christmas present at each plate—some chocolate sticks for Beck, and four cigars each for the rest of us. This, combined with some "ha-ha," was our Christmas celebration. We have sailed 1000 miles since leaving Tagus Cove.

Dec. 26.—Harris, Hull and myself went ashore collecting. The walking was very fair, principally smooth lava. Cactus was abundant in patches, and gum trees 10 ft. high. Birds plentiful, especially *Certhidea* and *Nesomimus*; found several species of *Geospiza*, the *Dendroica* and *Nesopelia* ; red-footed boobies were nesting in bushes all over the island, and we collected quite a number of eggs. Also saw yellow-crowned night herons, frigate birds, petrels, short-eared owls and *Larus*. Hull found the eggs partly developed in a large-billed *Geospiza* that he skinned. I collected some 30 birds. Hull and myself skinned 15 each in the afternoon. Saw no iguanas except small ones. Noticed some small grasshoppers and one small butterfly.

Dec. 27.—Skinned birds all the morning. Dinner a little early, and went ashore collecting ; took about 35 birds each. Tramped over a considerable part of the island. In character the island is the same all over. Got a few red-footed boobies' eggs. Also one egg of *Creagrus*. Hull shot a cuckoo, but failed to find it. Took in two boat-loads of cactus for the tortoise. Returned to the vessel at 7 p.m. This was our last day on the Galapagos Islands. We reached San Francisco again on Feb. 8th, 1898.

LIST OF THE MOST IMPORTANT WORKS AND ARTICLES ON THE FAUNA OF THE GALAPAGOS ISLANDS, REFERRED TO IN THE FOLLOWING PAGES.

J. Gould.—Remarks on a group of ground finches from Mr. Darwin's collection, with characters of the new species. In *Proc. Zool. Soc. Lond.* 1837, pp. 4—7.

J. Gould and Charles Darwin.—*Zoology of the Voyage of the "Beagle" during the years* 1832—1836, vol. iii. Birds (1841).

P. L. Sclater and Osbert Salvin.—Characters of new species collected by Dr. Habel in the Galapagos Islands. In *Proc. Zool. Soc. Lond.* 1870, pp. 322—327.

Osbert Salvin.—On the Avifauna of the Galapagos Archipelago. In *Trans. Zool. Soc. Lond.* v. ix., pp. 447—510, 1876.

Theodor Wolf.—Ein Besuch der Galapagos Inseln, *Heidelberg*, 1879.

Charles Darwin.—*Journal of Researches*, etc. Edition of 1890. Chapter xvii., pp. 397—427.

A. R. Wallace.—*Island Life.* Edition 1892. Chapter xiii. pp. 275—291.

W. L. and P. L. Sclater.—*The Geography of Mammals*, pp. 53, 54 (1899).

R. Ridgway.—Birds of the Galapagos Archipelago. In *Proc. U. S. Nat. Mus.* v. xix. pp. 459—670, 1897, and previous articles of the same author.

G. Baur.—On the Origin of the Galapagos Islands. In *Amer. Naturalist*, 1891, pp. 217—229, 307—326.

G. Baur.—Ein Besuch der Galapagos Inseln. In *Beilage zur Münchener Allgemeinen Zeitung*, Febr. 1—4, 1892.

G. Baur.—Ein Besuch der Galapagos Inseln. In *Biolog. Centralblatt*, 1892, pp. 221—250. A reprint of the former article.

G. Baur.—The Differentiation of Species on the Galapagos Islands and the Origin of the Group. In *Biolog. Lect. Mar. Biol. Laborat. Wood's Hall*, 1893, pp. 67—78.

G. Baur.—New observations on the Origin of the Galapagos Islands. In *Amer. Naturalist*, 1897, pp. 661—680, 864—896.

G. Baur.—Birds of the Galapagos Archipelago: A criticism of Mr. Robert Ridgway's paper. In *Amer. Naturalist*, 1897, pp. 777—784.

A. Agassiz.—The Galapagos Islands. In *Bull. Mus. Compar. Zool.* v. xxiii. pp. 56—75 (1892).

A. Günther.—President's Anniversary Address. In *Proc. Linn. Soc. Lond.* Oct. 1898, pp. 14—29.

IV.

GENERAL REMARKS ABOUT THE FAUNA OF THE GALAPAGOS ISLANDS.

To the zoologist the Galapagos Islands are "classic ground." Their natural history was unknown until they were visited by the *Beagle*. It was here that Darwin made many of the observations, "the importance of which in their bearing upon the study of natural science has never been equalled."* Since Darwin's time, however, large collections have been accumulated, chiefly by Dr. Habel in 1868, by the naturalists of the *Albatross* in 1888 and 1891, by Messrs. Baur and Adams in 1891, and now by the expedition under Mr. Harris. This material is perhaps larger than any material ever brought together from any area of similarly small dimensions. Although we must admit that we are still sadly in want of biological observations upon many of the birds, and of all knowledge of the nidification and eggs of the land-birds, we can hardly believe that this vast material is "still too fragmentary to warrant any serious attempt to solve the problems to which Mr. Darwin first called attention."† If such collections are not sufficient to throw light upon these problems, no collections will ever do so; and we cannot see how the discovery of five or six more subspecies of land-birds, or of some more accidental visitors, can alter our present conclusions. If we are not able now to solve some of the problems alluded to, then we are afraid it is not want of material that prevents our coming to satisfactory conclusions; but we are then either not able to deduct sufficiently from the material at hand, or no accumulation of zoological specimens will ever help to answer our questions.

As it is, we cannot spare our readers a short discussion on the origin of the Galapageian fauna, and we hope that our conclusions may be found to be acceptable, although we cannot explain everything, and although we do not for a moment think that ours will be the last word upon the subject.

There are two theories: viz., that of Darwin, Wallace, and most other naturalists, that the islands were uplifted from the ocean, and never were in connection with the continent of America, or with each other; and that of Dr. Baur, who said that the islands were once connected with America and with each other, and were submerged in or after the Eocene period. Both these views must be taken into earnest consideration. The geology of the Galapagos Islands shows that their formation is quite different from that of the opposite mainland of South America,‡

* Salvin in *Trans. Zool. Soc. Lond.* Vol. IX. p. 461.
† Ridgway in *Proc. U.S. Nat. Mus.* Vol. XIX. p. 459.
‡ Agassiz in *Bull. Mus. Comp. Zool.* Vol. XXIII. pp. 56-74.

the intervening sea declines to 1500 and 2000 fathoms, and is almost devoid of shallows and smaller islands towards the mainland. Geological evidence, therefore, is entirely opposed to a former land-connection of the Galapagos Islands with America. The flora has an undoubted American character, although the proportion of species confined to the islands in question is enormous.* The fauna represents most difficulties. Darwin † says : " But it is the circumstance that several of the islands possess their own species of the tortoise, mocking-thrush, finches, and numerous plants, these species having the same general habits, occupying analogous situations, and obviously filling the same place in the natural economy of this archipelago, that strikes me with wonder." Indeed, a wonder it may be called, that islands so close together, and apparently with the same natural conditions, have so many representative forms. Such facts were almost unknown, or at least not properly understood, at the time of Darwin's exploration ; but nowadays they are well known to every naturalist. A similar differentiation of forms—one form representing other closely allied ones on different islands—is now known to exist in every group of islands, apparently more pronounced in groups of greater age than in geologically younger groups of islands. Let us take for examples the *Drepanidae*, *Phaeornis*, *Chasiempis*, and *Moho* in the Hawaiian archipelago, the whole fauna of the Malayan and Papuan archipelago, especially the birds, marsupials, lepidoptera, the fauna of Antilles and the Philippines, the parrots of Curaçao, Aruba, and Bonaire, the birds of the Marianne and Caroline Islands—in fact, the fauna of almost every archipelago or of any detached islands on the earth's surface. Only the fact that the various islands are so very close to each other ‡ makes the case of the Galapagos more striking.

Dr. Baur § discusses the question how this " harmonic distribution " has come about. He maintains that there is only one explanation—namely, that the islands were in former times connected, forming a large and continuous mass of land, the volcanic rocks which now form the islands having been elevated on the latter. At that time, he says, the number of species found there was small. Then this mass of land became submerged, and the few original species which inhabited the whole area, having become restricted to the former mountain-tops, now islands, became differentiated in many different forms through isolation. This theory sounds very sensible and probable, but, if applied to the Galapagos Islands it must equally be applied to most other island-groups where similar phenomena exist, as we have explained before. Dr. Baur is convinced that the differentiation of so many forms on the various islands could never have taken place through the accidental arrival of individuals. The necessity of this deduction, however, we cannot see. It is doubtless, in our opinion, quite as intelligible, that the various islands have been populated from one island, where an ancestral form was living. Thus, they were reached at various times, and by-and-by, through isolation, the separated colonies became slightly changed, without the necessity of assuming a submergence of a great area, the existence of which is opposed to geological observations and theories. In fact, the differentiation, as found in the various forms, seems more explainable if we accept that they have reached their present home at various times, because their

* Darwin, *Journal of Researches*, p. 419 (Edit. 1890).

† *t.c.* p. 423.

‡ *t.c.* p. 423.

§ "The Differentiation of Species in the Galapagos Islands and the Origin of the Group." Boston (in *Biolog. Lect.*) 1895, and in American *Naturalist*, 1891, pp. 217-29 and 307-36).

characters are not harmonious, as we do not, for example, find all forms darker or paler, larger or smaller, on the same islands.

The next, and evidently the more important question, is, whence came the inhabitants of the Galapagos. We believe, with Darwin and others, that there can be no doubt that the whole fauna came from America.

The one or two species of rats, and the one bat, have their nearest relatives in South or Central America.

The relationship of the resident birds is as follows :—

Genus *Nesomimus :* Peculiar to the group, though closely allied to the purely American genus *Mimus*, in fact hardly generically separable (p. 142).

Genus *Dendroica :* Purely American (see afterwards, p. 147).

Genus *Certhidea :* Peculiar to the group. Somewhat uncertain, but evidently nearest allied to American forms (see afterwards, p. 148).

Genus *Progne :* Purely American (see p. 151).

Genus *Geospiza :* Peculiar to the group. Evidently nearest related to *Guiraca* and other purely American forms.

The *Dolichonyx* is probably only a visitor. Conspecific with the American form.

Genus *Myiarchus :* Purely South American.

Genus *Pyrocephalus :* Purely American. The two forms may almost be called dwarfed forms of the mainland species.

Coccyzus : The same as in South America.

The *Strix* has its nearest relative in South America (Ecuador. See afterwards, p. 202).

The *Asio* is peculiar, but nearest to the cosmopolitan *Asio accipitrinus.*

The *Buteo* is nearest allied to the North American *Buteo swainsoni*, which wanders in winter all over South America.

The *Fregata* is indifferent, being a widely spread marine form.

The *Pelecanus* is the Western American form.

The *Sulae* are more or less peculiar or Western American marine forms.

The *Phaëthon* is indifferent.

The *Ardea* is North American.

The *Herodias* is North and South American.

The *Butorides* is very closely allied to the continental American form.

The *Nyctanassa* is purely American.

The *Phoenicopterus* is not one of the South American species, but the one inhabiting the coasts of the Caribbean Sea, Florida, the Bahamas, etc.

The *Poecilonatta* is closely allied to *P. bahamensis*, which, according to Salvadori,* inhabits the "Bahamas, Antilles, and the whole of South America, with the Falklands, but is not found in Venezuela, Colombia, and Ecuador."

The genus *Nesopelia* is peculiar to the Galapagos, but nearest related to American genera.

The Rails (*Creciscus*) belong to an American genus.

The *Haematopus* is peculiar, but evidently nearest to American forms.

The *Spheniscus* is a peculiar species, but nearest akin to a Chilian species.

The *Oceanites*, *Procellaria*, *Oceanodroma*, *Puffinus*, *Aestrelata*, *Diomedea*, *Anous* and *Gulls* are indifferent, being marine.

The *Phalacrocorax* is quite peculiar, but not of value for our present question.

* *Cat. B. Brit. Mus.* Vol. XXVII. p. 284.

The number of North American migrants is very great and remarkable. The *Heteractitis* is the form breeding probably to the north of Alaska (?), but it is certainly misleading to call it a "Pacific" form,* as it merely extends its wanderings over parts of the Pacific Ocean.

The result is that the whole ornis, as far as it is not indifferent on account of of its being pelagic or cosmopolitan, is American or more or less closely allied to and consequently most likely derived from American forms.

The "obvious leaning toward certain Hawaiian dicaeidine forms" †, which Ridgway surmises does not exist, and the "possibility of a former land-connection of the Galapagos Islands with the Sandwich Islands, either continuous or by means of intermediate islands as stepping-stones," does therefore most certainly **not** become a factor in the problem.

Considering the distance from the American continent, the great number of species peculiar to the Galapagos, although remarkable, cannot be astonishing.‡ The footnote on p. 235 (in the Edition of 1890) of Darwin's *Journal of Researches*, based on a manuscript note of Dr. Sclater, is erroneous, for neither *Strix punctatissima*, nor *Pyrocephalus nanus*, *Otus galapagoensis* and *Zenaida galapagoensis* inhabit the American continent. On the contrary, progress of research has shown that the number of species and subspecies confined to the islands is far greater than it was believed to be.

The *Lacertilia* are of undoubted American origin, although—especially the marine *Amblyrhynchus cristatus*—local and of considerable interest.

The Giant Land-Tortoises offer the greatest difficulty. Nearly all authorities agree that it is not probable that they have crossed the wide sea between the Galapagos Islands and the American continent, although, while they are helpless and quite unable to swim, they can float on the water. If their ancestors had been "carried out to sea once or twice by a flood and safely drifted as far as the Galapagos Islands,"§ these ancestors must have been numerous on the continent. It is absolutely necessary to have palaeontological evidence, before we can answer the question whether they existed on the South American continent or not; and the examination of fossil or subfossil bones if any were found on the Galapagos Islands would also, perhaps, have most important results. At present we cannot, therefore, fully answer the question of the origin of the Giant Land-Tortoises on the Galapagos Islands.

The insect-fauna of the Galapagos Islands is naturally very poor, but there is nothing in it to oppose an American origin.

The number of the land-shells is not very large. There is said to be some slight similarity with Pacific forms (Darwin, *t.c.* p. 416), but it is doubtful if further researches will admit this fact as at all important; and, besides, we firmly believe, that the distribution of small land-shells on islands is not an important factor for zoogeographical problems, the easy transportation with drift-wood, bamboos, or by floating on the water, disqualifying them to a great extent.

* Ridgway in *Proc. U. S. Nat. Mus.* v. XIX. p. 463.

† Ridgway, *t.c.* p 467.

‡ On the other hand, we have instances where enormous distances have not caused any such remarkable differentiations—for example, on the Azores. Here, however, different winds, currents, different geological age and other circumstances have produced quite different conditions. Cf. Wallace, *Island Life.*

§ Wallace, *Island Life*, p. 279.

We have thus seen that the birds—which not only form the bulk of the inhabitants of the Galapagos Islands, but which are most important for zoo-geographical considerations, since they cannot easily be distributed involuntarily, resisting as they do the winds and currents to a great extent—as well as the rest of the animated nature of this group of islands, is either evidently of American origin, or not opposed to it. As far as the birds are concerned, they can all have reached the Galapagos without a former land-connection. The question therefore arises, are we justified to assume, on account of the presence of the tortoises, a former land-connection, and the disappearance of vast areas of land, here as well as between Africa, Aldabra, and the Mascarenes? It seems more natural to assume the disappearance of a great stock of animals, the remains of which have survived, through favourable circumstances and the absence of enemies—men and beasts—on outlying marine islands, than to assume the disappearance, in comparatively recent times (*i.e.*, in the Eocene period or later), of enormous land-masses. On the other hand, if great islands and mountain ranges have been uplifted, others might as well have—and we know they have—been submerged. Palaeontological researches and many more soundings in the ocean seem to be of much importance for the solution of such problems. At present we can only come to the following conclusions :—

I. The entire fauna of the Galapagos Islands derived originally from America.

II. It is uncertain whether there has ever been a land-connection between the various islands and between the islands and the continent or not.

Now to return to the ornithology of the group. There are several interesting facts which should be mentioned. The absence, with few exceptions, of brightly coloured species, and the prevalence of sombre forms, is striking, but can be understood from the sombre aspect of the sunburnt rocks and the vegetation. A peculiar feature is the quantity of birds found in the dress of immature individuals. This is most apparent and has often been commented on among the *Geospizae*. It is not, however, confined to the genus *Geospiza*, but is equally found in the genus **Certhidea**. Of *Sula piscatrix websteri*, which breed in great numbers in white plumage on Clarion Island, while greyish brown individuals are rarely seen there, hundreds breed on the Galapagos Islands in a grey-brown dress, very much like that of the young birds, but paler. White specimens of this *Sula* are very rare on the Galapagos Islands. The Anous (*Anous stolidus galapagensis*) resembles somewhat an immature *Anous stolidus* having the crown somewhat darker, and quite dark birds are numerous.

The reason for this peculiarity is not known, but one might suggest that it lies in some want of strength, or a somewhat arrested development.

The great tameness of the birds has been mentioned by most visitors to these islands. We find the same on other oceanic uninhabited islands, most of all on Laysan, where it is quite stupendous.*

With regard to the affinities between the fauna of the various islands, we find that the birds of those islands which are nearer to each other are generally much more allied or identical, while the more distant islands have many less forms in common. This of course applies almost only to the land birds. In many cases Narborough, Albemarle, James, Jervis, Duncan, Indefatigable and Barrington have the same forms, in others at least James, Jervis, Duncan, and Indefatigable. The

* Cf. Schauinsland, *Drei Monate auf einer Koralleninsel*, and Rothschild, *Avifauna of Laysan*, Part 1

more outlying islands, Chatham, Charles, and Hood, and again Bindloe, Abingdon, and Tower, as well as Wenman and Culpepper, have generally more differentiated forms. Abingdon and Bindloe have apparently almost always the same subspecies, if the species is found on both. The ornis of Hood and Tower is very poor in the number of species, but very different. Wenman and Culpepper have also very few species of land birds, but they are nearly all different from those of the other islands. The *Nesomimus* of Wenman, however, we cannot distinguish from that of the central islands. Wenman and Culpepper have often, but by no means always, the same forms.

Both Wenman and Culpepper are as yet apparently insufficiently explored. Narborough and Albemarle have the same forms, as might be expected from their close proximity, but the *Nesomimus* seems to be quite different, although closely allied. These facts seem not to have been explained before ; in fact, only a large material could help to show them.

The evident affinities with the North and Central American ornis (cf. *Phoenicopterus ruber*, *Haematopus galapagensis* (very closely allied to *H. frazari* from Lower California), *Ardea herodias*, and perhaps *Myiarchus* and *Dendroica*) are easily explained by the tendency of northern forms to migrate in a southerly direction, while tropical forms do not actually migrate. Analogous facts are observed in the Canary and Cape Verde Islands, where a great proportion of European forms is found. The southern hemisphere has evidently sent hardly any colonists to the Galapagos Islands. The only striking example of these is *Spheniscus mendiculus*. This is by far the most northern home of any member of the order *Impennes*, which is entirely restricted to the southern hemisphere. No species is known to cross the equator, only three reach as far north as Peru, Rio Grande do Sul, and South Africa, and *Spheniscus mendiculus* alone lives on the equator. Of no other resident bird can we confidently say that it can only have been derived from the southern hemisphere. Even migrants from the south are not known to occur, with the exception of the alleged occurrence of a single specimen of *Querquedula versicolor* (see p. 203).

It has been thought to be possible that the larger islands might have different representative forms in various parts. Especially of the large island of Albemarle the probability has been suggested, that the birds of North- and South-Albemarle might differ, as the tortoises from these parts are recognised as two different species. Our collections, however, do not support this idea, but they seem to prove that only one representative form is found on every island.

Salvin has also raised the question, whether the elevated interior portions of the islands, where "clouds usually hang over the higher mountains, where the moisture is far greater than on the sea-shore, and consequently the vegetation is far more luxuriant," were inhabited by different birds. Mr. Harris and his companions did not find this to be the case, but they found the same subspecies in suitable places in the various parts of the islands.

During our work we have had most assistance from Mr. Ridgway's admirable work on the *Birds of the Galapagos Archipelago*. Principally we agree with Mr. Ridgway in going as far as possible in distinguishing, and consequently naming, as many forms as possible ; and we fully bear witness "that the real promoter of chaos and enemy of order is the 'lumper,' and not his much maligned co-worker, the 'hair-splitter.'"

Our material, consisting of not less than 3075 skins from the recent expedition under Mr. Harris, and the Baur collection of about 1100 skins, is by far the largest

hitherto brought together. Besides this, we have had constant access to Gould's and Salvin's types in the British Museum. It is therefore natural that we have, in some cases, come to conclusions different even from those of the latest authority, Mr. Ridgway. In all, or nearly all such cases, we found that it has been the weight of our large material which altered the decision. The instances where we deviate from Ridgway among the most difficult group, the *Fringillidae* (genus *Geospiza*), are not numerous. The various species of *Pyrocephalus* described by Ridgway could not be recognised, nor could we possibly separate the *Certhideae* from the central group of islands. In the genus *Sula* good work has been done by Harris' party in collecting for the first time, apparently, specimens of what had been called *Sula cyanops*. It is not *S. cyanops*, but the rare *Sula variegata*. The Galapagos Islands are its breeding-place.

Perhaps the most extraordinary discovery is the flightless *Phalacrocorax harrisi* Rothsch. Dr. Sharpe has placed it in a new genus which he called *Nannopterum*, but we do not see the necessity of doing so. The *Diomedea* breeding on Hood Island, hitherto believed to be *D. exulans*, is *D. irrorata*, formerly only known from the type-specimen in the British Museum.

We have for the first time used trinomials for the local forms of the *Passeres*. If trinomials are used everywhere else, there is no reason why the birds of the Galapagos Islands should be deprived of this most useful form of nomenclature. In cases where certain individuals of representative forms are hardly, if at all, distinguishable, but where a series is easily separable, the recognition of subspecies is inevitable. Our material has generally left very little doubt to us, whether we should treat a form as species or subspecies. In cases where we could not easily decide, or where our material has misled us, we must trust to future explorations for a modification or correction of our present arrangement.

The advent of men has apparently not yet influenced the ornis of the Galapagos to a great extent. It is only on Charles Island that we can confidently say that the *Nesomimus trifasciatus* has disappeared, and where probably at least one or two thick-billed finches have become extinct. As the earliest settlement of men has been on Charles Island, and as we know that they had no regard for the birds—sailors, finding the tameness of the birds strange and novel, used to take a cruel pleasure in knocking them down with sticks—we are probably right in ascribing these disappearances merely to human influence.

It is to be feared that the progress of guano-digging and cultivation, and the fact that cattle, goats, horses, asses, pigs, dogs and cats have become wild on various islands (see Wolf & Baur in *Amer. Naturalist*, 1891, p. 318), will influence the status of the ornis ere long, and we must therefore consider it rather fortunate that such large collections are already safely preserved, especially in the museums of Tring, London, and Washington.

V.

THE BIRDS OF THE GALAPAGOS ISLANDS.

Genus NESOMIMUS Ridgw.

This genus has been separated from *Mimus* on account of its longer and basally more compressed bill and longer tarsus, but these characters are hardly sufficient for generic separation, the longer tarsus especially being a very weak character.

Mr. Ridgway remarked that there are two groups "which in a more exact sense might be considered as species, the several allied forms being more properly subspecies." Four or five groups would be even more natural, *N. trifasciatus*, *N. macdonaldi*, and *parvulus* with *affinis* standing rather by itself. Ridgway mentioned eight species; we are now able to recognise eleven different forms. In all the species the *male* has a longer bill and is generally a little larger than the *female*, but similar in colour.

1. **Nesomimus trifasciatus** (Gould).

Orpheus trifasciatus J. Gould in *P. Zool. Soc. Lond.* p. 27 (1837).
Mimus trifasciatus, Gray, *Zool. Voy. Beagle*, III. Birds, p. 62. Pl. XVI. (Charles I.) (1841).
Nesomimus trifasciatus, Ridgway, p. 483 (1861).

This species is easily recognisable by its large size and broad blackish brown band across the chest, interrupted and concealed in the middle. There are, however, not two bands, as one might expect from Ridgway's "key." The wing-coverts have very conspicuous large white spots. The wing of the male is 128—130 mm. long, the tail 123 (about—most specimens being in worn plumage, with the tails much abraded), tarsus 40, exposed culmen 26—27 mm. The same measurements in the *female* are: Wing 116—120, tail 115 (approximately), culmen 25—26, tarsus 38—40 mm. "Iris seal-brown, tarsi, feet and bill blackish."

No specimens of this species have been collected since Darwin's visit to the Galapagos, where it was found on Charles Island, and the two skins in the British Museum are the only ones known from that island. Neither Dr. Habel, the naturalists of the *Albatross*, nor Messrs. Baur & Adams met with this bird on Charles Island. Our collectors did not find a *Nesomimus* on Charles Island, where it is probably now extinct; but on Gardner Island, a little islet close to Charles Island, they found *N. trifasciatus* rather plentiful. At the time of their visit (October) they were in worn plumage, and no young birds were met with.

Of all the species of *Nesomimus* this is one of the most distinct ones, and it differs from all the others in the colour of its iris, which is of a rich seal-brown, while all the other species have a greenish or pale yellow iris. One of our skins has a few white feathers in the crown.

2. **Nesomimus macdonaldi** Ridgw.

N. macdonaldi, Ridgway in *Proc. U.S. Nat. Mus.* XII. p. 103. fig. 1; XIX. p. 484 (1890).

Easily distinguished from *N. trifasciatus* by the markings on the breast, which is not crossed by a wide interrupted black band, but only by an area of dark brown spots, the crop-region too being crossed by a band of smaller dark brown spots, separated from the other row of spots by a narrow unspotted whitish belt. The feathers of the upper parts have more distinct brownish grey edges, so that the upper surface has a much paler aspect.

The bill is very long in adult *males*. "The iris is yellowish."

The home of this bird is Hood Island, where five skins were collected by the *Albatross*, and where Baur & Adams caught about half a dozen, one of which they skinned, while the others reached us in spirits.

Our collectors found them common. They were in rather worn plumage in

October. Dr. Baur procured also a specimen on Gardner Island, near Hood Island, a small island in front of Gardner Bay. This island has nothing to do with the other Gardner Island, near Charles Island. This latter one is marked on the chart, the one near Hood not. Dr. Baur visited only Gardner Island near Hood Island, Harris' expedition the one near Charles Island. The existence of these two Gardner Islands has led Mr. Ridgway to make his note on p. 484, doubting Dr. Baur's statement that he got *N. macdonaldi* on Gardner Island. The specimen is not lost at Guayaquil, nor are most of the other specimens said to be lost by Mr. Ridgway. Mr. Ridgway has evidently only received for examination the skins and a small portion of the spirit-specimens. Dr. Baur has now published a careful list of the specimens actually lost by him at Guayaquil, and all the other spirit-birds are in our collection.

3. **Nesomimus adamsi** Ridgw.

N. adamsi, Ridgway in *Proc. U.S. Nat. Mus.* XVII. p. 358 (1894); XIX. p. 487 (1896).
(*Mimus melanotis* partim Gould, Sundevall and Ridgway 1889.)

This mocking-thrush is an inhabitant of Chatham Island, where it has been known to exist since 1841, but was then confounded with *N. melanotis*. It differs, however, clearly from the latter in having a more or less developed black line on each side of the throat, under the ear-coverts, sometimes running up to the base of the bill. Across the chest a dusky shade, in which are a number of brown spots, thus forming an indistinct band across the chest. There are, however, a few specimens in which this band is hardly indicated at all. The ear-coverts are just as black as, but certainly not blacker than, in *N. melanotis*. The pileum is often, but not always, lighter than in *N. melanotis*. In the young the feathers of the back and rump are broadly margined with pale rusty cinnamon, and the foreneck, chest, and sides of body are thickly spotted with black, as in a European song-thrush. "Iris yellowish." It is somewhat arbitrary whether this form is placed in the same section with *N. macdonaldi* or with *N. melanotis*; we have therefore not given it a trinomial name for the present, although it is hardly more than a subspecies. We have the type and three skins from Dr. Baur, as well as some spirit-specimens from the same collector, and Harris' party found the bird common on Chatham Island. They were in good plumage in October. Some skins are strongly washed with buff, but this is evidently due to some external process.

4. **Nesomimus melanotis personatus** Ridgw.

N. personatus Ridgw. in *Proc. U.S Nat. Mus.* XII. p. 104 (1890); XIX. p. 488 (1896).

This form is very much like *N. melanotis melanotis*, but differs in being slightly larger and darker above, with the flanks more tinged with brown. Sides of the neck less widely white. "Iris yellowish."

This form was discovered on Abingdon by the naturalists of the *Albatross*. Messrs. Baur & Adams obtained several which were put in spirits of wine, and Mr. Harris' expedition met with it on the same island, where it was not rare.

5. **Nesomimus melanotis melanotis** (Gould).

Orpheus melanotis, Gould in *Proc. Zool. Soc. Lond.* p. 27 (without locality) (1837).
Mimus melanotis Gould, *Voy. Beagle*, III. Birds, p. 62. Pl. XVII. (Chatham and James Is.) (1841) ; Sharpe, *Cat. B. Brit. Mus.* VI. p. 349 (1881).
Nesomimus m., Ridgway in *Proc. U.S. Nat. Mus.* XIX. p. 489 (1896).

This is by far the best known species of *Nesomimus*. It is known from Indefatigable, Jervis, and James Islands. Mr. Harris' party also found it frequently on Wenman, one of the two small detached northern islands. This is one of the most peculiar phenomena in the distribution of the Galapagos birds ; but we may state that we have most carefully compared our five series, and do not find any constant character at all to distinguish the Wenman birds from those of Jervis, James, and Indefatigable.

Another interesting fact is that no *Nesomimus* was found on Duncan Island, although diligently sought for. We have a large series from all the four islands.

6. **Nesomimus melanotis carringtoni** W. Rothsch.

N. carringtoni W. Rothsch. in *Bull. B. O. Club* (October) (1898).*

Very closely allied to *N. melanotis melanotis*, but distinguishable by a longer and slenderer bill, shorter wing and generally paler upper surface. Wing shorter, and tips to rectrices larger than in *N. bauri*. Wing ♂ 108—111 mm., ♀ 199—104 mm., tail ♂ 110—115, ♀ approximately 105 (all worn), exposed culmen ♂ about 28 mm., ♀ about 26 mm. " Iris yellowish."

Former collectors did not mention a *Nesomimus* on Barrington Island ; Messrs. Baur & Adams, however, say that they procured specimens there, but they were lost. The new collections contain a good series of this form.

Eight specimens in Tring Museum, including the type.

The name of this form has unfortunately been misprinted, as it should of course have been spelt with a *b*.

7. **Nesomimus melanotis hulli** W. Rothsch.

N. hulli, W. Rothschild in *Bull. B. O. Club*, p. 52 (May 1898).

Differs from *N. melanotis melanotis* in having the buffy-white tips to the primaries—and still more those to the secondaries—decidedly wider, and in having a very distinct moustache-like line of black spots from the base of the mandible to the neck. Dimensions as in *N. melanotis melanotis*.

This form was found abundantly on Culpepper Island. It is named as a compliment to Mr. Hull, one of the collectors of the expedition.

Six specimens in Tring Museum, including the type.

8. **Nesomimus melanotis bauri** Ridgw.

N. bauri, Ridgway in *Proc. U.S. Nat. Mus.* XVII. p. 357 (1894). XIX. p. 492(1896).

Differs from *N. melanotis melanotis* in having a longer bill, lighter sides of breast and body, smaller white terminal spots to the rectrices, and in having a moustache-like line of blackish spots along the sides of the throat. It differs from *N. melanotis personatus* of Abingdon Island in being much lighter above, the colour

* *Nesomimus barringtonensis* nom. nud. Baur, in *Amer. Naturalist*, 1897, on list between pages 780 and 781, without description, must be added as a probable synonym. The specimen obtained was really lost at Guayaquil.

of the upperside being about the same as in *N. melanotis melanotis*. Dimensions hardly less than of *N. melanotis personatus*, but the dusky black streaks on the flanks are much narrower than in the latter. "Iris yellowish." Wing ♂ 115—121 mm., ♀ 110—111 mm.

Messrs. Baur & Adams discovered this species on Tower Island, where it was also found abundantly by Harris' party. The Tring Museum possesses the type (which has been in spirits), and a good series collected by Baur's and Harris' parties.

9. **Nesomimus melanotis bindloei** Ridg.

N. bindloei Ridgway in *Proc. U.S. Nat. Mus.* XVII. p. 358. XIX. p. 492 (1894).

Very similar to *N. melanotis bauri*, but smaller, with the tarsus generally 2 or 3 mm. longer, the lesser wing-coverts with slightly lighter tips, ear-coverts more uniformly black, moustachial line of spots on sides of throat less distinct, while on the other hand there are generally some small black spots on the sides of the neck, under the ear-coverts and sometimes even on the chest. Discovered by Baur & Adams, and found to be common on Bindloe Island by our collecting party.

The Tring Museum possesses the type and ten others from the Baur collection, in addition to a good series of the new collection. ♂ wing, 108—117 mm.; ♀ wing, 103—107 mm. (average 103).

10. **Nesomimus parvulus parvulus** (J. Gould).

Orpheus parvulus, J. Gould in *Proc. Zool. Soc. Lond.* p. 27 (1837).
Mimus parvulus, Gray, *Zool. Voy. Beagle*, v. III. Birds, p. 63. t. 18 (1841).
Nesomimus parvulus, Ridgway in *Proc. U.S. Nat. Mus.* XIX. p. 491.

Easily distinguished from *N. melanotis* by its smaller size, especially its shorter and somewhat less curved bill, generally paler colour of the upperside and more brownish, paler striped ear-coverts. A brownish shade across the chest is visible in most specimens. Wing of ♂ ad. wing 111—113 mm., exposed culmen 18—21 (average 20); ♀ ad. wing 104—109 mm., exposed culmen 17—20·5 (average 18). The colour of the upperside varies much, some specimens being much darker than others.

This species is abundant in North and South Albemarle.

11. **Nesomimus parvulus affinis** W. Rothsch.

N. affinis, W. Rothschild in *Bull. B. O. C.* p. 53 (May 1898).

Very closely allied to *N. parvulus parvulus* of Albemarle, but above darker and deeper brown than even the darkest *N. parvulus parvulus*. The stripes on the sides of the body are generally broader and darker. White spots on wing-coverts smaller. Measurements as in *N. parvulus parvulus*.

Discovered by Harris' expedition on Narborough Island. Six skins in the Tring Museum.

Key to the Forms of the Genus *Nesomimus*.

1. { Breast crossed by an interrupted band of dark brown spots : 2.
   { Breast not crossed by a band of brown spots : 4.
2. { Wing under 115 mm. : *N. adamsi*.
   { Wing over 115 mm. : 3.

3. {Sides of chest blackish brown ; *N. trifasciatus.*
{Sides of chest white with brown spots : *N. macdonaldi.*

4. {Bill smaller : 5.
{Bill larger : 6.

5. {Above lighter, with more distinct pale edges to the feathers and larger white tips to the wing coverts : *N. parvulus.*
{Above much deeper brown with less distinct pale edges, tips to wing-coverts smaller : *N. p. affinis.*

6. {Rump distinctly rufous : *N. m. bindloei.*
{Rump not distinctly rufous : 7.

7. {Whitish tips to the remiges much wider : *N. m. hulli.*
{Whitish tips to the remiges much narrower : 8.

8. {Darker above : 9.
{Paler above : 10.

9. {Generally larger, flanks darker, sides of neck less broadly white : *N. m. personatus.*
{Generally smaller, flanks a little lighter, sides of neck broader white : *N. melanotis.*

10. {Wing longer, tips to rectrices smaller with distinct brown shaft line : *N. m. bauri.*
{Wing shorter, tips to rectrices larger and without dark shaft-stripes : *N. m. carringtoni.*

Genus DENDROICA Gray.

Dendroica Gray, *List. Gen. B. App.* III. p. 8 (1842).

The genus *Dendroica* is largely represented in North and Middle America, the West Indies and the most northern part of South America, while the other parts of South America are greatly frequented by migrants from North America, but have no resident forms of the genus. The Galapagos Islands are inhabited by one species, which has no very near ally in South America, but rather in the West Indies.

1. **Dendroica aureola** (Gould).

Sylvicola aureola Gould, *Zool. Beagle*, III. Birds p. 86. Pl. XXVIII. (1841).
Dendroica aureola, Sharpe, *Cat. B. Brit. Mus.* X. p. 282 (1885) ; Salvin, *Trans. Zool. Soc. Lond.* IX. p. 473 ; Ridgway in *Proc. U.S. Nat. Mus.* XIX. pp. 465, 493.

We have this species from the following islands :—Culpepper, Wenman, Abingdon, Bindloe, Tower, Albemarle, Narborough, James, Jervis, Duncan, Indefatigable, Chatham, Charles, Gardner and Hood.

The affinity to *D. petechia* of Jamaica is remarkable. *D. cureola* differs from the latter in having a more intensely orange-rufous, much darker pileum, in being generally slightly darker on the back, and in having the wing generally one or two millimetres longer. Specimens from Gorgona Island, on the coast of Colombia, and Cocos Island are quite like those from the Galapagos Islands. The species is also said to occur at Guayaquil (Baur & Adams) and in Peru (Solzmann & Raimondi), but we have not seen continental specimens.

D. rufopileata of Curaçao, Bonaire and Aruba has the crown still deeper, of a

rufous-chestnut brown, and is much smaller. *D. aurocapilla* Ridgw. from Grand Cayman is apparently only distinguishable by its lighter crown, and perhaps slightly shorter wing. The differences between *D. petechia* of Jamaica and *D. aurocapilla* are extremely slight and apparently not constant, unless the latter is of a somewhat darker green above. We have no *D. gundlachi* to compare. All these forms are evidently only of subspecific value.

Genus CERTHIDEA Gould.

Certhidea, Gould in *Proc. Zool. Soc. Lond.*, p. 7 (1837).

Gould described this genus as belonging to the *Fringillidae*. Messrs. Sclater and Salvin (cf. *Nomencl. Av. Neotrop.* p. 16; *Trans. Zool. Soc. Lond.* v. IX. p. 476; *Cat. B. Brit. Mus.* v. XI. p. 27) placed it in the *Coerebidae*, subfamily *Dacnidinae*, near *Dacnis* and *Conirostrum*; Mr. Ridgway (*Proc. U. S. Nat. Mus.* v. XIX. p. 497) considers it to belong to the *Mniotiltidae*. We find it difficult to decide between *Mniotiltidae* and *Coerebidae*, as we find the bill to agree well with some *Dendroicae*, and also with some of the smaller forms of *Dacnis*, while the wing, in which the first primary is considerably shorter than the second and third, agrees more with the *Mniotiltidae* than with *Dacnis*. A very close and thorough examination of the anatomy of a good many *Mniotiltidae*, *Coerebidae*, and *Certhideae* will be necessary to decide finally the position of *Certhidea* and of the value of a number of Passerine families, the division of which is at present a great "crux ornithologiae."

We have been obliged to unite several of the species recognised by Ridgway in the central group of islands. Ridgway's material was very insufficient.

1. **Certhidea olivacea olivacea** Gould.

Certhidea olivacea, Gould in *Proc. Zool. Soc. Lond.* (1837) p. 7, *Zool. Voy. Beagle*, III. Birds, p. 106. pl. XLIV.; Sclater, *Cat. B. Brit. Mus.* XI. p. 28; Ridgway in *Proc. U. S. Nat. Mus.* XIX. p. 498.
Certhidea salvini, Ridgway in *Proc. U.S. Nat. Mus.* XVII. p. 358, XIX. p. 500.
Certhidea albemarlei, Ridgway in *Proc. U.S. Nat. Mus.* XVII. p. 360, XIX. p. 500.

In this, as well as in other species of the genus, the perfectly adult birds in full colour (probably the nuptial dress) are as rare as we have found them among the finches. The adult *male* in full dress is as follows :—Upperside pale olive, pileum and hindneck more olive-grey, rump and upper tail-coverts lighter and more yellowish-brownish ; wings and tail dusky brown, outwardly edged with light olive, inner webs of remiges edged with whitish grey; upper wing-coverts broadly bordered with light reddish brown, under wing-coverts white, strongly washed with buff and yellowish cinnamon ; short superciliary line, extending to about 4 mm. beyond the eye ; chin, throat, and foreneck bright rufous cinnamon ; remainder of under surface creamy buff, with an olive tinge ; sides washed with olive brown ; breast with more or less concealed spots of bright rufous cinnamon ; under tail-coverts washed with rufous cinnamon. Wing, 55—57 mm. ; tail, 37—40 ; bill, from nostril to tip, 7 mm. The adult *female* seems to have the wing mostly a little shorter, not exceeding 56 mm., mostly 54 to 55 only ; the abdomen paler, more whitish ; and it seems from our large series that the *female* never assumes such a largely and bright rufous cinnamon area on the throat and foreneck as the adult *male*, although some of the *females* have a certain amount of cinnamon colour on the throat. The immature birds of both sexes are much paler, and without a shade of rufous cinnamon anywhere.

We have altogether received, and have before us now, 176 skins of *Certhidea olivacea*—viz., 10 from Jervis, 12 from Narborough, 35 from Indefatigable, 45 from various places on Albemarle, 28 from Duncan, and 46 from James Island. We are unable to detect any differences between the specimens from the various islands, the differences of colour assigned to Ridgway's *C. salvini* and *albemarlei* being due to different age of the specimens, the larger bill of *C. salvini* being not in the least borne out by our material.

2. **Certhidea olivacea luteola** Ridgw.

Certhidea luteola, Ridgway in *Proc. U.S. Nat. Mus.* XVII. p. 360, XIX. p. 501.

We have a large series from Chatham Island, including the type, and find that the birds from there are closely allied to *C. olivacea olivacea*, but differ in being generally more olivaceous on the back, and distinctly darker and somewhat more olive beneath. It seems also that the bill has a tendency to be darker, for many of our specimens have perfectly black bills, while of the enormous series of *C. olivacea olivacea* not one has a really black bill. None of our *C. olivacea luteola*—all collected either in June (Baur) or October—has a rufous throat, but some freshly coming feathers in one of our *males* show beyond doubt that a red throat is sometimes attained !

This form is only known from Chatham Island.

3. **Certhidea olivacea ridgwayi** subsp. nov.

The *Certhidea* of Charles Island differs much from *C. olivacea olivacea* and *C. olivacea luteola* in the much lighter under-surface, which wants the olive tinge. Its upperside is perhaps more brownish-greyish, but this is difficult to say for certain, as all our specimens are in abraded plumage. The throat is of the same rufous-cinnamon, but appears to be more rusty, as it is on a lighter, less olive ground, and in lighter surroundings. The rectrices, which have only very narrow light brownish tips in *C. olivacea olivacea* and *C. olivacea luteola*, have whitish tips of 1 to 1½ mm. in width. The bill of most of our specimens is deep black, and is perhaps generally a little stouter. We have only ten skins from Charles Island. One of these is in its first plumage, which differs much from the dress of the adult bird. It is above dark blackish brown, on the pileum almost uniform black, on the back, rump, and upper tail-coverts with broad light brown edges to the feathers, which are again very narrowly fringed with black on the utmost tips, all the feathers ashy grey at their bases. Wings and wing-coverts similarly edged, more rusty on the latter. Feathers of underside ashy grey at base, then dark slate-colour and rusty buff on their tips ; throat patched with blackish slate-colour, caused by the greater extent of the slaty colour in the middle of the feathers.

In the colour of the underside *C. o. ridgwayi* resembles *C. cinerascens*, but is not so white, and the adult *males* have a red throat, which is apparently never assumed by *C. cinerascens*.

Named in honour of Mr. Robert Ridgway, to whom we owe the best work on the birds of the Galapagos Islands.

4. **Certhidea olivacea becki** Rothsch.

Certhidea becki, Rothschild in *Bull. B. O. Club.* VII. p. 53 (May 1898).

The form of *Certhidea* fonnd on Wenman Island by the Harris expedition, in August 1897, differs from *C. olivacea olivacea* in being darker above, darker and

browner on the chest, flanks, and sides of breast. The wing is a little longer, measuring 56 to nearly 59 mm. in our *males*, and 52 to 54 mm. in our *females*. *C. o. becki* is much more closely allied to *C. o. fusca* from Abingdon and Bindloe Islands than to *C. o. olivacea*, but differs in being still a faint shade darker above and especially on the sides and flanks. The wing is longer, as in *C. o. fusca* it does not exceed 54 mm. in the largest *males*. The bill of *C. o. becki* measures 8 to 9 mm. from nostril to tip. The throat has a distinct ochraceous patch in one *male* and an ochraceous shade in two *females* before us. We are not able to say if this colour would be as bright and widely spread as in adult *males* of *C. o. olivacea*, if a larger series from the proper season were examined.

We have only ten specimens from Wenman.

This form is named in compliment to Mr. Beck, who accompanied the expedition as collector.

5. **Certhidea olivacea drownei** Rothsch.

Certhidea drownei, Rothschild in *Bull. B. O. Club.* VII. p. 53 (May 1898).

Only two specimens, both marked "♂," were procured on Culpepper Island. They are very much like *C. o. becki*, but the sides of the breast are darker, more olive, and the pileum is darker, the darker blackish bases of the feathers being somewhat extended. They seem also to be considerably larger. The wing of one measures 62 mm., that of the other 57, but we believe the latter to be a *female*, although it is marked "♂." The bill from nostril to tip is 9 mm. in one, 8 in the other, but the bill seems to be rather wide at base. The throat is somewhat ochraceous in both.

A larger series would be desirable to confirm this subspecies. It is named as a compliment to Mr. Browne, another of the collectors.

6. **Certhidea olivacea mentalis** Ridgw.

Certhidea mentalis, Ridgway in *Proc. U.S. Nat. Mus.* XVII. p. 359, XIX. p. 504.

This is a most doubtful form from Tower Island. Mr. Ridgway has separated it from its nearest ally, *C. fusca*, on account of its being, as he states, "rather smaller, colour darker and less olivaceous, the under parts dull light olive-greyish, becoming pale buffy on chin and under wing-coverts." Unfortunately all the specimens from Dr. Baur's collection seem to have been in spirits, therefore the slight differences in colour are not of much importance, and our new series of about thirty specimens, skinned on the spot, are all in such dreadfully abraded, worn plumage, that they are quite unfit for comparison with regard to colour. There is no appreciable difference in size. It is, however, remarkable that all the specimens from Tower, collected in December, except one, have black mandibles, and of those of Dr. Baur's, shot early in September, two have blackish, the others brownish white mandibles, while in our large series from Abingdon and Bindloe, collected in August, there is not one with a blackish mandible. This character, on the other hand, is probably seasonal. The buff colour on the chin may be a character peculiar to the Tower form, but this is as yet not certain, as we can only see it in four of the typical specimens collected by Dr. Baur. Freshly moulted material, and if possible from the same season, both from Tower and Abingdon or Bindloe Islands, will be necessary to decide finally about the form *mentalis*.

7. **Certhidea olivacea fusca** Scl. & Salv.

Certhidea fusca, Sclater & Salvin in *Proc. Zool. Soc. Lond.* (1870, pp. 323, 324) ; Salvin in *Trans. Zool. Soc. Lond.* IX. p. 477 ; Sclater, *Cat. B. Brit. Mus.* XI. p. 28 (1886) ; Ridgway in *Proc. U.S. Nat. Mus.* XIX. p. 502.

This form is decidedly paler below than the other subspecies of *C. olivacea*, and less olivaceous above and beneath, and the adult *male* does evidently never acquire the tawny, cinnamon, or ochraceous throat, chin, or superciliary line. The bill is generally rather longish, measuring 8·3 to 9·1 mm. from nostril to tip of upper jaw. In about fifty skins from Abingdon and Bindloe before us, there is none with a wholly black bill.

C. o. fusca is common on Abingdon and Bindloe Islands, and specimens from the two islands are indistinguishable.

8. **Certhidea cinerascens cinerascens** Ridgw.

Certhidea cinerascens, Ridgway in *Proc. U.S. Nat. Mus.* XII. pp. 105, 119, 127.
Certhidea olivascens (lapsus calami), Ridgway in *Proc. U.S. Nat. Mus.* XII. p. 124.
Certhidea cinerascens, Ridgway in *U.S. Nat. Mus.* XIX. p. 503.

This form differs so much from all the preceding ones, by its much paler undersurface, which is brownish white, its more greyish back and generally shorter bill, that it will probably be necessary to keep it (together with *bifasciata*) specifically distinct from the *olivacea*-group. The bill does not exceed 8·5 mm. (from nostril to tip). The rectrices have very narrow white tips, which are widest on the outermost rectrices, where also the inner web is bordered with white, the upper wing-coverts have pale whitish-brown edges. Unfortunately our series, which is collected in October, is in very abraded, worn plumage, but it seems that the throat is never rufous or ochraceous at all, but the breast has a buff tinge in the middle.

This form is known from Hood Island, and we have also one from Gardner near Hood Island.

9. **Certhidea cinerascens bifasciata** Ridgw.

Certhidea bifasciata, Ridgway in *Proc. U.S. Nat. Mus.* XVII. p. 359 ; XIX. p. 304.

Nearest to *C. cinerascens cinerascens*, from which it differs in being still whiter beneath, being almost pure white with a buff tinge, and with two fairly distinct whitish bars across the wing, formed by the wide almost white tips to the middle and greater upper wing-coverts. Only found on Barrington Island.

The iris of all *Certhideae* is brown.

Genus PROGNE Boie.

Progne, Boie in *Isis* p. 971 (1826).
Phaeoprogne, Baird, *Review Amer. B.* p. 283.

This genus is spread over the greater parts of temperate and tropical America and West Indian Islands. One species peculiar to the Galapagos Islands.

1. **Progne concolor** Gould.*

Hirundo concolor, Gould in *Proc. Zool. Soc. Lond.* p. 22 (1837).
Progne concolor, Salvin in *Trans. Zool. Soc. Lond.* IX. p. 476 ; Sharpe, *Cat. B. Brit. Mus.* X. p. 176; Sharpe & Wyatt, Monograph *Swallows*, II. p. 463, pl. 90.
Hirundo modesta, Néboux in *Rev. Zool.* p. 291 (1840).
Progne modesta, Gould, *Zool. Beagle*, III. Birds, p. 39, pl. 5 ; Ridgway in *Proc. U.S. Nat. Mus.* XIX. p. 505.

This species differs from *P. subis* (= *purpurea*) in its considerably smaller size, the wing of the adult *male* not measuring more than 130 mm., and generally less, and in the absence of the concealed spot under the wing. The underside of the *female* differs widely from that of the *female* of *P. subis*, being deep sooty brown without any white.

Darwin discovered this swallow on James Island (not Chatham Island, as quoted by mistake in *Cat. B. Brit. Mus.* X. p. 176), Néboux obtained it on Charles Island, Townsend on Indefatigable, where it had also been seen by Habel, Baur (*American Naturalist*, 1897, p. 783) mentions it from Barrington (teste Néboux), and we have received a beautiful series of twenty-six skins from Charles, Chatham, and Albemarle Islands.

" The iris is brown in both sexes, feet and bill black."

Genus HIRUNDO L.

Nearly cosmopolitan.

1. **Hirundo rustica erythrogastra** Bodd.

Hirundo erythrogaster Bodd. *Tabl. Pl. Enl.* p. 45 (1783).

Five skins of the North American swallow were procured in October and November on Charles and Chatham Islands. They are doubtless migrants from the north.

Genus GEOSPIZA J. Gould.

(Plate VI.)

Geospiza, J. Gould, in *P. Zool. Soc. Lond.* 1837. p. 5 (Type : *G. magnirostris*).
Cactornis, J. Gould, *ibid.* p. 6 (Type : *C. scandens*).
Camarhynchus, J. Gould, *ibid.* p. 6 (Type : *C. psittacula*).
Platyspiza, Ridgway, in *P. U.S. Nat. Mus.* XIX. p. 546 (1896).
Cactospiza, Ridgway, *ibid.* p. 546 (1896).

In the *Catalogue of Birds* Dr. Sharpe recognised the three genera created by Gould in 1837, but Mr. Ridgway, in 1894 and 1896, united *Geospiza* and *Cactornis* for good reasons, keeping, however, *Camarhynchus* separate, without, in our opinion, sufficient reasons, and created two new generic names (*Cactospiza* and *Platyspiza*), without need and to no practical purpose, as he did not even use these terms in his nomenclature. We cannot see the use of subgeneric names, as they are, by universal agreement, not to be used in nomenclature. If it is convenient to separate groups within a genus they may be named *a*, *b*, *c*, or groups with longer, intermediate or

* The name *concolor* has been rejected on account of the existence of a *Hirundo concolor* of Sykes in 1832. As, however, Sykes' *concolor* belongs to another genus, there is no logical reason for rejecting that name. The disturbing paragraph "once a synonym always a synonym" is a great mistake if adopted in similar cases. We are not accepting this custom, and one of us has already elsewhere written on the subject.

shorter bills, as the case may be; but names which are not to be used are, in our opinion, an unnecessary burden in such cases. Our reason for uniting *Camarhynchus* with *Geospiza* is, that we see about the same intergradation in the form of the bills of that supposed genus with the genus *Geospiza* in Ridgway's sense, as we saw between *Cactornis* and *Geospiza* in the old sense. We cannot admit the coloration as a generic character, not only because in our case it would bring the young of some of the species in another genus than the adult *males*, but we cannot see that, in ornithology, it can be used as a generic character in any case, as the sexes and ages, and sometimes seasonal plumages, differ so materially in many birds, and abnormal colorations, such as albinoes, are rather frequent. Mr. Ridgway admits that he "indeed finds himself quite unable to give precise characters for the genus *Camarhynchus*," and that "the differences in the form of the bill presented by *Camarhynchus*, as defined by him, from *Geospiza*, while perfectly obvious on comparison of specimens,* are extremely difficult to describe, since they result chiefly from variations of curvature in its outlines and relative proportions of various minor details hardly susceptible of exact definition." This certainly does not sound very convincing. Mr. Ridgway further admits that the transition from "*Cactornis*" *pallidus* to "*Camarhynchus*" *psittaculus* is complete, but we find this to be the same with "*Cactornis*" *pallidus* and *Geospiza*; in fact, we think that "*Cactornis*" *pallidus* is still closer connected with *Geospiza* than with *Camarhynchus* in the old sense. Ridgway's figures (in *P. U.S. Nat. Mus.* XIX. Plates XVI., XVII.) are very instructive, and will explain our meaning to those who have no specimens to refer to. See also our Plate VI.

Mr. Harris makes the following observation: "The long-billed *Geospizae* (or *Cactornis*) were observed to be more cactus-feeders than the thick-billed forms—for example *G. strenua*. Such *Geospizae* as *strenua*, *pachyrhyncha*, and *conirostris* were observed to be more seed-eaters than the slender-billed ones (*Cactornis*). The smaller species, as *fuliginosa*, *fratercula*, and *fortis* were observed to frequent the shores, of the more northern islands especially, in search of food, whereas the slender-billed *Geospizae*, and those with very large beaks, were **never** seen feeding on the rocky shores."

The genus *Geospiza* is, in the *Catalogue of Birds*, Vol. XII., placed at the head of the *Fringillidae*, followed by *Chloris* and separated by ten genera from *Guiraca*. The South American members of the genus *Guiraca*, in Dr. Sharpe's sense, are, nevertheless, the nearest relations to *Geospiza*, the form of the bill being indeed very similar between the thick-billed *Geospizae*, such as *Geospiza strenua* and *Guiraca cyanoides*, especially the backward extension of the culmen (nasal bones in skeleton) is very much the same in these genera; while the wing is less pointed, the feet larger and stronger, the tail very much shorter in *Geopiza*. The first primary in *Geospiza* is rudimentary, not visible from below, and adapted to its covert; the second (first long) primary is shorter than the third. The resemblance with certain thick-billed Hawaiian finches, such as *Telespiza*, cannot have any serious consideration, as indicative of real relationship.

Most of the species are well defined, others less, and some vary greatly in dimensions and proportions. It is evident that adult black *males* are not equally frequent in certain species. While black individuals are surprisingly rare in many species, they are very frequent in *Geospiza conirostris* Ridgw. There can be no doubt, we think, that all the black specimens are adult *males*. In the members of

* We should think not in the case of "*Cactornis*" *pallidus*

the old genus *Camarhynchus* totally black individuals are not found, but it seems that all the *Geospizae* and *Cactornithes* in the old sense, except "*Cactornis*" *pallidus*, have the adult *male* black, with the exception of the under tail-coverts, which have white borders. The bill is only black in black-plumaged adult *males*; but not in all. It seems evident that those with brown bills are less aged than those with black bills; but why the latter, and in fact black individuals of most of the species, are so rare is quite unexplainable to us.

The variations in size are great within some of the species, and younger birds have very small bills—a fact which has more than once led authors to mistakes.

1. **Geospiza magnirostris** J. Gould.

Geospiza magnirostris, J. Gould in *P. Zool. Soc. Lond.* 1837. p. 5; *Zool. Beagle*, III. Birds, p. 100, Pl. XXXVI. (1841); Salvin in *Trans. Zool. Soc. Lond.* IX. p. 478 (1876) (bill); Sharpe, *Cat. B. Brit. Mus.* XII. pp. 6, 7 (fig.); Ridgway *l.c.* p. 512.

It is very strange that this largest-billed form of finches from the whole group has not been met with by any collector since Darwin's visit to the Galapagos. There are, in our opinion, only two possibilities:

(1) That this form is a larger representative of *G. strenua* on Charles Island.

(2) That the few specimens in the British Museum are exceptionally large individuals of *G. strenua*.

The first theory is probably the correct one. The origin of the type-specimens is not exactly known. Probably neither Dr. Sharpe nor Mr. Ridgway remembered in the moment when they treated of these finches what Darwin said in his *Journal of Researches* (new edition, 1890, p. 420) about his omission to label his collections. He there says: "Unfortunately most of the specimens of the finch-tribe were mingled together, but I have strong reasons to suspect that some of the species of the sub-group *Geospiza* are confined to separate islands"; and again, on p. 421, "whereas the numerous specimens shot either on Charles or on Chatham Island (for the two sets were mingled together) all belonged to the two other species." It is thus evident that the locality of Chatham Island for *G. magnirostris* is open to doubt. We have no doubt that all the specimens came from Charles Island. Neither Dr. Habel, nor Baur & Adams, nor the recent collectors whose collections are before us, found **any** very large *Geospiza* on Charles Island, not even *G. strenua*. The "*Albatross*" only procured one specimen, which Ridgway refers to *G. strenua*. Considering, however, that it is an immature bird, and that the two forms *G. magnirostris* and *strenua* are so closely allied that they differ only in having the wings and bills a few millimètres larger or smaller, it is quite possible that it is a young of *G. magnirostris*. It is probable that *G. magnirostris* is exterminated or extremely scarce. This is quite possible when we consider that *Nesomimus trifasciatus* has disappeared from Charles Island, and that these finches, according to Darwin (*Zool. Beagle*, *t.c.* p. 100), did "much injury by digging up roots and seeds from a depth of even six inches." It is therefore to be supposed that they were killed by the colonists, who complained of their injuries, and who first settled on Charles Island about 1830. The locality Chatham Island is certainly wrong, for no big-billed form has ever been found there; and there are no early settlers who might have killed them long ago.

The dimensions of the three black specimens in the British Museum are: culmen, 26·5, 27, 27 mm.; height of bill at base, 23·5—24 mm.; wing, 91, 91, 95 mm.; tarsus, 25 mm.

The second possibility—viz., that *G. magnirostris* cannot be separated from *G. strenua*—must be considered, because the measurements of a number of *G. strenua* will show how much they differ in proportions of bill and wing ; but as we do not find the combinations of a culmen of over 26·5 mm. and more, with a wing of 91 mm. and more, we cannot unite *G. magnirostris magnirostris* and *G. magnirostris strenua*, as the nomenclature of these forms should probably be, under one name.

2. **Geospiza strenua** J. Gould.

Geospiza strenua, J. Gould in *P. Zool. Soc.* (1837) p. 5 ; *Zool. Voy. Beagle*, III. Birds, p. 100, Pl. XXXVII. (1841) ; Salvin in *Trans. Zool. Soc. Lond.* IX. p. 479 (1876) ; Sharpe, *Cat. B. Brit. Mus.* XVI. p. 8 (1888); Ridgway, *t.c.* p. 514.

Geospiza pachyrhyncha, Ridgway in *P. U.S. Nat. Mus.* XVIII. p. 293 (1896) ; Ridgway, *t.c.* p. 516.

Ridgway enumerates **Charles Island** as one of the islands inhabited by this bird, but we presume that the specimen procured by the "*Albatross*" must belong to *G. magnirostris* if it came from Charles Island. We shall see below how small young individuals of these finches are, compared with adult birds.

Chatham Island is given on the authority of Darwin ; but no such birds ever being found there, and Darwin himself stating that he had mixed the finches up, we must entirely disregard the statement that this species ever occurred on Chatham Island, and we think that the type must have come from James Island, our skins from there agreeing with the type of the species in the British Museum.

G. strenua is evidently not rare on **James Island**, for we have seen 24 specimens from there, in addition to those in the British Museum. The black *males* from James measure as follows :—

Culmen.	Basal depth of bill.	Gonys.	Basal width of mandible.	Wing.
24 mm.	22 mm.	13 mm.	16 mm.	88 mm.
24 „	20 „	13 „	15 „	86 „
21 „	18 „	12 „	14 „	82 „

It was first found on **Bindloe** by Dr. Habel. We have examined 34 Bindloe skins. The black *males* measure :—

Culmen.	Basal depth of bill.	Gonys.	Basal width of mandible.	Wing.
22·5 mm.	19·5 mm.	12 mm.	—	(Moulting.)
21·5 „	18·5 „	12·5 „	15 mm.) (Dr.	82 mm.
20 „	17 „	11 „	14 „) Baur)	82 „
22·5 „	19 „	12 „	14 „	82 „
24·5 „	21 „	13·5 „	17 „	86 „

Habel also discovered it on **Abingdon Island**. It is evidently very common on

Abingdon, as we have received not less than 39 skins from the recent expedition. The black *males* measure ;—

Culmen.	Basal depth of bill.	Gonys.	Basal width of mandible.	Wing.
24·5 mm.	21 mm.	14 mm.	16·5 mm.	84 mm.
22 „	20 „	11 „	15 „	84 „
25·5 „	21 „	13 „	16 „	85 „
22 „	21 „	13 „	16 „	83 „
24 „	21·5 „	12 „	16 „	88 „
23·5 „	20 „	13·5 „	15 „	84 „

Indefatigable is also known to be inhabited by *G. strenua* since Habel's expedition. It was also found there by Messrs. Baur & Adams, and we have altogether received 11 specimens from this island, but not a single one is a fully adult *male*. We are giving the measurements first of the largest of our specimens, secondly of our blackest *male*, which is about half black. The measurements are :—

Culmen.	Basal depth of bill.	Gonys.	Basal width of mandible.	Wing.
25 mm.	21 mm.	14 mm.	17 mm.	84 mm.
24 „	19 „	13 „	15 „	(Damaged.)

Tower Island is also inhabited by *G. strenua*. Specimens from Tower, collected by Messrs. Baur & Adams, were described by Ridgway as belonging to a new species, which he called *G. pachyrhyncha*. Specifically they belong doubtless to *G. strenua*, but it is true that most of the Tower specimens are rather large. As, however, they are reached or even eclipsed in nearly all their measurements by specimens from other islands, we cannot at present separate them even subspecifically. If a large material of adult males should confirm the constancy of this form, it would have to be called *G. strenua pachyrhyncha*. The 3 black *males* of the 9 we have examined measure as follows :—

Culmen.	Basal depth of bill.	Gonys.	Basal width of mandible.	Wing.
25·5 mm.	22 mm.	13 mm.	17 mm.	87 mm.
24 „	22 „	12 „	17 „	87 „
26 „	22·5 „	13·5 „	17·5 „	89 „

Jervis Island is another home of this finch. Baur & Adams and the recent collectors must have found it rather common there, for we received altogether not less than 26 specimens, and black *males* were rather frequent among them. They are generally not very large, but so variable and so close to specimens from other

islands, some fully reaching the latter in all dimensions, that it is impossible to separate them. The black *males* measure :—

Culmen.	Basal depth of bill.	Gonys.	Basal width of mandible.	Wing.
23 mm.	21 mm.	13 mm.	16 mm.	87 mm.
24 „	22 „	13 „	17 „	84 „
23 „	19 „	11·8 „	15 „	88 „
24 „	21 „	13·5 „	16 „	86 „
23·5 „	18·5 „	11 „	14 „	83 „
23 „	21 „	11·5 „	14·5 „	83 „
23 „	18·5 „	12 „	14 „	85 „
22·5 „	20 „	12 „	15 „	83·5 „
21 „	19 „	11 „	14 „	82 „
21·5 „	19·5 „	12 „	14·5 „	—

Baur said that on **Albemarle Island** he procured specimens of *Geospiza magnirostris*. These were, according to Mr. Ridgway, lost in a box at Guayaquil, a statement which, as Dr. Baur himself stated afterwards, arose out of some mistake, probably on Dr. Baur's side, and in fact we found these specimens in a bottle in spirits. They are clearly not *G. magnirostris*, but *G. strenua*. One of the two shot by Dr. Baur at La Tortuga is very large, the other very small. We have examined 9 skins from Albemarle (La Tortuga, Dr. Baur, Tagus Cove, recent expedition), and find the black *males* to measure as follows :—

Culmen.	Basal depth of bill.	Gonys.	Basal width of mandible.	Wing.
24 mm.	22 mm.	14 mm. (Dr. Baur, La Tortuga.)	16 mm.	(Moulting.)
19 „	17 „	13 mm. (Dr. Baur, La Tortuga.)	13 „	83 mm.
23 „	19 „	12 mm.	15 „	83 „
24 „	21 „	13 „	15 „	83 „

From **Duncan Island** we have only seen three young individuals in grey plumage. They have fairly large beaks (culmen 22 to 24 mm.), and we have no doubt belong *G. strenua*.

From **Barrington** we received only one specimen, a fairly black *male*, but with the bill deep brown, reddish brown on the mandible, and the abdomen streaked with greyish brown. It measures :—

Culmen.	Basal depth of bill.	Gonys.	Basal width of mandible.	Wing.
22 mm.	19 mm.	14 mm.	15·5 mm.	86 mm.

From **Wenman Island** we have also one single *male* only, but it is quite black. It measures :—

Culmen.	Basal depth of bill.	Gonys.	Basal width of mandible.	Wing.
24 mm.	22 mm.	14 mm.	16 mm.	86 mm.

We should most certainly have expected a new species from Wenman Island, but we can see no reason whatever to separate our specimen from typical *Geospiza strenua*.

While the differences in size between the *males* and *females* are very small, the young birds are much smaller than old ones. The accompanying figures will illustrate that these differences occur alike in the various islands, and also that they cannot satisfactorily be separated.

3. **Geospiza darwini** sp. nov.

This is perhaps a form originally evolved from the following species, *G. conirostris*, but it has a much larger and heavier beak, and thus stands somewhat between *G. strenua* and *G. conirostris*.

Adult ♂. Intensely black, feathers on breast, abdomen, and back slightly edged with olive ; it differs conspicuously from the other large *Geospizae*, *G. magnirostris*, *G. strenua* and *G. conirostris*, by the olive rump, a character more or less apparent in the small *Geospizae* only ; under tail-coverts whitish buff, secondaries tipped slightly with buffy white, outer edge of primaries olive. Bill compressed and rounded, like in *G. conirostris*, but, unlike the other species of *Geospizae*, abruptly narrowed 3 millimetres from the tip and elongated sharply to the point.

Adult ♀. Head, neck and throat black, slightly edged on each feather with olive buff, rest of body blackish, broadly variegated with olive buff, wings brown edged with dark buff. 4 ♂♂, 1 ♀ measure as follows :—

	Culmen.	Height of Bill.	Width of Bill.	Gonys.	Wing.
♂.	24 mm.	20 mm.	14 mm.	14 mm.	85 mm.
♂.	23 „	18 „	13 „	13 „	83 „
♂.	23 „	17 „	13 „	12 „	82 „
♂.	23 „	19 „	15 „	14 „	86 „
♀.	24 „	19 „	15 „	15 „	84 „

Hab. Culpepper Island, Galapagos.

4. **Geospiza conirostris conirostris** Ridgw.

G. conirostris, **Ridgway** in *P. U.S. Nat. Mus.* XII. p. 106, Fig. 2 (1890) ; **Ridgway** in *P. U.S. Nat. Mus.* XIX. p. 516 (1896),
G. media, *l. supra c.* p. 107, Fig. 3 (1890) ; **Ridgway**, *l. infra c.* p. 577, Pl. LVII. Fig. 13 (1896).

Ridgway has separated two species of big-billed finches from Hood Island, *G. conirostris* and *G. media*, and with only eight of the former and four of the latter supposed species before him, this might have seemed very plausible, but with our

72 specimens from Hood Island, together with one from Gardner near Hood, there does not remain a shadow of doubt that they are one somewhat variable species. This species is characterised by its bill being much more elongated and narrower than in *G. strenua*, and by the prevalence of blackish colour in the *females* and young birds, which are much darker than in *G. strenua*, being brownish black above and below, on the underside with whitish edges from the chest downwards. The culmen varies in *males* from 24 to 18·5 mm., the basal width of mandible from 13 to 9 mm., the height at base from 18 to 14 mm., the gonys from 13·5 to 10·5 mm.

5. **Geospiza conirostris brevirostris** Ridgw.

Cactornis brevirostris, Ridgway in *Proc. U.S. Nat. Mus.* Vol. XII. p. 108, Fig. 4 (1890).
Geospiza brevirostris, Ridgway *op.c.* XIX. p. 541.

In 1890 Mr. Ridgway described from a single immature specimen of the "*Albatross*" expedition as new a finch which he called *Cactornis brevirostris*, which in 1896 he also places among the *Cactornis* group of *Geospiza*, comparing it with *Geospiza barringtoni*. After a close examination of the figure and our one skin from Gardner Island (near Charles Island), we are forced to remove it altogether from the Cactornis group, it being barely distinguishable from the smaller-billed specimens (= *media* Ridgway cf. antea) of *Geospiza conirostris* from Hood Island.

There is some uncertainty about the locality of the type specimen, as Ridgway in both 1890 and 1896 first quotes it as coming from Chatham Island, and then several times as being found on Charles Island, again on p. 512 in Vol. XIX. of the Washington periodical he omits it on Charles (resp. Chatham) and places the number for it by mistake on James Island. We think the real home must be Charles, because we have one specimen which we take to belong to *brevirostris* from Gardner (near Charles), which has the same fauna as the larger Charles Island.

The only difference we can see between *G. conirostris conirostris* and *G. conirostris brevirostris* is that the bill of the latter is slightly smaller and narrower.

We possess only one probably adult *female* from Gardner Island (near Charles Island), collected by the recent expedition.

(We have one young *Geospiza* from Indefatigable which agrees with Ridgway's description of Dr. Habel's specimen from the same island. These birds are too light to belong to *G. conirostris brevirostris*, and all the measurements are distinctly smaller.

This form, unfortunately, cannot finally be named or described, on account of the absence of adult specimens in collections, as far as we know; but it will probably be an unnamed subspecies of *G. conirostris*. See also Salvin's remark in *Trans. Zool. Soc. Lond.* IX. p. 481 under *G. fortis*.)

6. **Geospiza conirostris propinqua** Ridgw.

Geospiza propinqua, Ridgway in *Proc. U.S. Nat. Mus.* XVII. p. 361 (1894) and *op. cit.* XIX. p. 543 (1896).

Described from Tower Island, whence we have a series from Dr. Baur, including the type and a good many from the new expedition, among them a fair number of adult *males*. They agree so well with *G. conirostris conirostris*, that one has to examine them very closely to discover the points of difference in the

shape of the beak so ably pointed out by Mr. Ridgway. We can therefore only consider it to be a subspecies of *G. conirostris*. The type is one of the smallest of all our adult *males*.

Five adult *males* from the new collection measure as follows :—

Culmen.	Height at Base.	Basal Width.	Gonys.
22 mm.	17 mm.	13 mm.	13 mm.
23 ,,	15 ,,	11 ,,	12 ,,
19 ,,	13 ,,	11 ,,	11 ,,
22 ,,	16 ,,	13 ,,	12 ,,
22 ,,	14 ,,	12 ,,	12 ,,

7. **Geospiza conirostris subsp.** ?

We have three young specimens of a *Geospiza* from Culpepper Island which we believe to be a form of *G. conirostris*, from which they differ in not being quite so dark, and the light margins to the feathers being more buffy, and the beaks appear to be a little larger, the back paler, the wing-coverts rather broadly margined with rusty rufous.

We cannot come to any definite decision without examining adult specimens.

8. **Geospiza dubia dubia** Gould.

Geospiza dubia, J. Gould in *Proc. Zool. Soc. Lond.* pt. V. p. 6 (1837)—*Zool. Voy. Beagle*, III. Birds p. 103 (1841) ; Salvin in *Trans. Zool. Soc.* IX. pt. 11, p. 480 (1876) ; Sharpe, *Cat. B. Brit. Mus.*, XII. p. 9 (1888) ; Ridgway in *Proc. U.S. Nat. Mus.* XIX. p. 519 (1896).

The type of this species came from Chatham Island, and is no longer in existence (cf. Sharpe, *l.c.*). The Smithsonian Institution received a series from the "*Albatross*" voyage, and Messrs. Baur & Adams, as well as the Harris' expedition, collected good series of it.

This species differs from the foregoing ones in its much shorter bill, and from *G. fortis* in its larger-sized bill.

Besides forty-seven skins from Chatham, we have five from Barrington and fourteen from Duncan Island, which we cannot separate from *G. dubia*. There is, however, no perfectly adult *male* from either Barrington or Duncan Island, and the Barrington specimens are on an average rather small.

9. **Geospiza dubia albemarlei** Ridgw.

Geospiza albemarlei, Ridgway in *Proc. U.S. Nat. Mus.* XVII. p. 362 (1894), *id. op. cit.* XIX. p. 523 (1896) (not separated from *G. fortis*).

Mr. Ridgway originally compared his *G. albemarlei* with his *G. media* (= *conirostris*) and *G. dubia* Gld., but afterwards, on comparing his Albemarle specimens with *G. fortis*, came to the conclusion that they were hardly, if at all, different, but admitted that some specimens were nearer *G. dubia* than *G. fortis*.

From the examination of a large series from Albemarle and three from Narborough Island it is evident, however, that this form can be separated, but must be treated as a subspecies of *G. dubia*, and not of *G. fortis*, because it is always separable from the latter by its larger bill and wing. The differences from *G. dubia* are exceedingly slight, but generally the wing is 2 to 4 mm. longer, and the culmen a little more arched.

10. **Geospiza dubia bauri** Ridgw.

Geospiza bauri Ridgway in *Proc. U.S. Nat. Mus.* XVII. p. 362 (1894), and *op. cit.* XIX. p. 518 (1896).

This form is only known from James Island, where it seems to be rare, as we have only three skins from the Baur collection, including the type. It has a larger beak than *G. dubia dubia*, while the wing is of exactly the same length, and therefore we do not think it can be more than subspecifically separated.

11. **Geospiza dubia simillima** subsp. nov.

This form from Charles Island is almost indistinguishable from *G. dubia albemarlei*, but the wing is from 2 to 3 mm. longer. We have one perfectly adult ♂, and four immature birds.

12. **Geospiza fortis fortis** Gould.

Geospiza fortis, Gould in *P. Zool. Soc. Lond.* p. 5 (1837); *Zool. Voy. Beagle*, III. Birds, p. 101, pl. XXXVIII (Charles Island); Salvin in *Trans. Zool. Soc. Lond.* IX. pl. IX. p. 481 (1876); Sharpe, *Cat. B. Brit. Mus.* XII. p. 10 (partim).

Geospiza nebulosa, Gould in *P. Zool. Soc. Lond.* 1837, p. 5; Sharpe, *Cat. B. Brit. Mus.* XII. p. 11 (partim).

G. fortis, Ridgway in *Proc. U.S. Nat. Mus.* XIX. p. 521.

This species is most frequent on Charles (whence the type came), Duncan, Jervis, James, Gardner near Charles Island, Indefatigable, Chatham, and Cowley Islands. The specimens from Albemarle, which Ridgway (*l.c.*) finally united with *G. fortis*, belong to *G. dubia*, of which they are a subspecies, being far too big to be *G. fortis*. The birds from Bindloe, which Ridgway had not seen, and which were lumped with *G. fortis* by Salvin and others, belong clearly to the same form as those from Abingdon. They can only be separated as a subspecies from *G. fortis*. We have one young *female* from Barrington Island, which agrees in the shortness of its wing with *G. f. fratercula* rather than with *G. f. fortis*. It may possibly belong to an unnamed subspecies, but adult *males* are required to decide this question.

13. **Geospiza fortis fratercula** Ridgw.

Geospiza fratercula, Ridgway in *Proc. U.S. Nat. Mus.* XVII. p. 363 (1894), *id.* in *Proc. U.S. Nat. Mus.* XIX. p. 525.

Ridgway knew this form from Abingdon Island only, but our series from Bindloe is perfectly similar. We cannot fully appreciate the alleged differences in the form of the bill, and the only difference we can see is the shorter wing, which is about 3 to 6 mm. shorter than in *Geospiza fortis fortis*. We cannot detect tangible differences in colour between these forms.

14. **Geospiza fuliginosa fuliginosa** Gould.

Geospiza fuliginosa, Gould in *Proc. Zool. Soc. Lond.* 1837, p. 5; Salvin in *Trans. Zool. Soc. Lond.* IX. 1876, p. 482; Sharpe, *Cat. B. Brit. Mus.* XII. p. 12; Ridgway in *Proc. U.S. Nat. Mus.* XIX. p. 526.

Geospiza parvula, Gould in *Proc. Zool. Soc. Lond.* p. 6 (1837); *Zool. Voy. Beagle*, III. Birds, p. 102, tab. XXXIX. (1841); Salvin in *Trans. Zool. Soc. Lond.* IX. p. 483; Sharpe, *Cat. B. Brit. Mus.* XII. p. 13; Ridgway in *Proc. U.S. Nat. Mus.* XIX. p. 529.

As will be seen from the above synonymy, Gould, Salvin, Sharpe and Ridgway have separated a species called *G. parvula*, which we unite with *G. fuliginosa*.

The type of "*G. parvula*," according to Darwin, had been collected on James Island. Sharpe's locality, Chatham Island, for the same must therefore be incorrect. Salvin describes and figures specimens from Bindloe Island, which are different, but cannot be called *G. parvula*. Ridgway quotes as islands inhabited by *G. parvula*, Chatham, James, Bindloe, Abingdon, but he is evidently not very confident with regard to the value of his *G. parvula*, saying that he thinks "it can be demonstrated that the line between the two supposed species cannot be sharply drawn." We have examined, of what we consider typical *G. fuliginosa* :—

22 skins from Charles Island. Wings, 61—65 mm. ; culmen 12—14.

104 from Chatham Island. Wings 60—66 mm. ; culmen 12—14·2.

10 from Hood Island. Wings about 62 mm. ; culmen 12—14. No black-billed adult *male* among them.

46 from Albemarle Island. Wings, 60—65 mm. ; culmen 13—14.

11 from Narborough Island. Wings, 63—65 mm. ; culmen 12—13. The wings average rather long, but the number of specimens is so much smaller than from other islands that this of no importance.

28 from James Island. Wings, 62—64·5 mm. ; culmen 12—13·5. We are not able to separate the specimens from James Island in the least from typical *G. fuliginosa*.

26 from Barrington Island. Wings, 60—65 mm. ; culmen 12—14.

46 from Duncan Island. Wings, 62—65 mm. ; culmen, 12—14.

21 from Indefatigable. Wings, 61—65 mm. ; culmen, 13—14.

12 from Gardner (near Charles) Island. Wings, 60—65 mm. ; culmen, 13—14.

26 from Jervis Island. Wings, 60—67 mm. ; culmen, 13—14.

We have thus examined over 350 specimens, but in the measurements very young birds or such with the wing in moult are not included, as they may only help to give a wrong impression.

15. **Geospiza fuliginosa minor** subsp. nov.

We have examined forty-three skins from Bindloe Island, with the wing 58—62 mm., the culmen, 11—13·5 ; seventy-three from Abingdon Island, wing, 58—63 mm., culmen, 12—13·5. In addition to these small differences, however, the bill is much slenderer and more compressed laterally. The number of adult *males* which we were able to measure is very small, but the material is quite sufficient to show beyond any doubt that the Abingdon and Bindloe form deserves the rank of a subspecies.

16. **Geospiza acutirostris** Ridgw.

Geospiza acutirostris, Ridgway in *Proc. U. S. Nat. Mus.* XVII. p. 363 (1894) ; Ridgway, *op. cit.* XIX. p. 531. Pl. LVII. fig. 21 (1896).

This species differs very distinctly from *G. fuliginosa* and *G. fuliginosa minor* in its rather long, thin, straight and pointed bill. We have been able to examine sixty-five specimens, including the type. In no other species have we seen such a proportion of black-billed adult black *males*, while black *males* with yellowish beaks are very scarce. All the birds of the Harris' expedition were killed in December.

The measurements of *G. acutirostris* are given very correctly by Ridgway.

This species is only known from Tower Island.

17. **Geospiza dentirostris** Gould.

Geospiza dentirostris, Gould in *P. Zool. Soc. Lond.* 1837, p. 6 ; *Zool. Beagle*, III. Birds, p. 102 (1841) ; Salvin in *Trans. Zool. Soc. Lond.* IX. p. 483 (partim) ; Sharpe, *Cat. B. Brit. Mus.* XII. p. 11 ; Ridgway in *Proc. U.S. Nat. Mus.* XIX. p. 532.

There are in the British Museum a *male* and a *female*, which are identified by Dr. Sharpe as *G. dentirostris*. One is evidently the type. It is in our opinion an immature bird, probably a *female*. Its culmen measures 14·7 mm. ; the bill from nostril to tip, 10·8; wing, 68. The other specimen is a black *male*, and marked on its original label " Charles Island." Its culmen measures 14·8 mm.; the bill from nostril to tip, 9·8. The former specimen, the type, has the " tooth," from which it has received its name, much in front of the middle of the cutting edge of the upper jaw, only a few millimètres from the tip, and the " tooth " is well visible from above. In Admiral Markham's bird, however, the " tooth " is exactly in the middle of the cutting edge of the upper jaw, and not to be seen from above. The type has no exact locality marked, and no original label. Except for the presence of the " tooth " it might almost be an immature *G. fortis*.

It is curious that neither Mr. Townsend, Messrs. Baur & Adams, nor Harris' expedition came across such a bird, and the dissimilarity of the two only known skins in the British Museum forces one to suspect that they might be aberrations ; but we must await further observations before coming to a definite conclusion about it.

18. **Geospiza** spec. inc.

We have one black *male* of a *Geospiza*, skinned from a bird in spirits brought home by Dr. Baur, from Chatham Island, where it had been killed on September 8th, 1891. Its bill is almost but not quite black. Its upper jaw has no " tooth," but in dimensions this bird agrees wonderfully with *G. dentirostris*. The culmen measures 14·5 mm.; the bill from nostril to tip, 9·8 ; the wing, 69. Without further evidence we are not able to say whether this species is the same as *G. dentirostris*, whether it is a hybrid between one of the larger and one of the smaller species of *Geospiza*, or whether it belongs to a hitherto unknown and unnamed species.

19. **Geospiza difficilis** Sharpe.

Geospiza dentirostris partim (non Gould !) Salvin in *Trans. Zool. Soc.* IX. p. 483.
Geospiza difficilis Sharpe, *Cat. B. Brit. Mus.* XII. p. 12 ; Ridgway in *Proc. U.S. Nat. Mus.* XIX. p. 532.

The colour of this species is generally very dark, and very brownish. Not a single specimen has the abdomen whitish. The bill has no " tooth," the culmen is remarkably elevated and arched near the base, and depressed again in front of the nostril. The length of the culmen in our old *males*—though none of them has a perfectly black bill—is 14—14·8 mm.; the wing, 63—64. The iris is brown. We have a large series from Abingdon Island collected in August. The only authentic locality for this species is Abingdon Island. The locality Charles Island for a skin from Markham must be erroneous, such a distribution being unheard of.

20. **Geospiza debilirostris** Ridgw.

Geospiza debilirostris, Ridgway in *Proc. U.S. Nat. Mus.* XVII. p. 363 (1894) ; XIX. p. 533.

Messrs. Baur & Adams collected several of this species in spirits, and our recent collection contains a large series. Most of our specimens show also a

depression on the culmen in front of the nostril, but not so well marked as in *G. difficilis*. In size of the bill *G. debilirostris* approaches *G. fortis*, but the bill is smaller and not so high. The culmen of adult *males* measures 16 mm.; greatest height of bill near base, 9·6—10 mm.; wing, 71—73 mm.; the tarsus, 26 mm.; middle toe without claw, 15 mm.

21. **Geospiza scandens scandens** (Gould).

Cactornis scandens, Gould in *Proc. Zool. Soc. Lond.* 1837, p. 7 ; *Zool. Voy. Beagle*, III. Birds, p. 104, Pl. XLII. ; Salvin in *Trans. Zool. Soc. Lond.* IX. p. 485 (1876) ; Sharpe, *Cat. B. Brit. Mus.* XII. p. 19.
Geospiza scandens, Ridgway in *Proc. U.S. Nat. Mus.* XIX. p. 534.

G. scandens scandens is only known from James Island, but *G. scandens intermedia* and *G. scandens fatigata* are so closely allied that it is very difficult to separate them. Young specimens of these subspecies are not always separable. Adult black *males* with black bills of *G. scandens scandens*: culmen, 18—18·5 mm.; wing, 70—72 mm.

22. **Geospiza scandens intermedia** Ridgw.

Geospiza intermedia, Ridgway in *Proc. U.S. Nat. Mus.* XVII. p. 361 ; Ridgway *op. cit.* XIX. p. 535.
(?) *Cactornis assimilis*, Gould in *Proc. Zool. Soc. Lond.* 1837, p. 7 ; *Voy. Beagle*, III. Birds, p. 105, Pl. XLIII.

The form from Charles Island differs from typical *G. scandens* in having the bill slightly larger. The culmen of adult *males* measures 19—21·5 mm.; the wing, 70—75 mm. We have it also from Gardner.

Cactornis assimilis of Gould certainly did not come from Bindloe Island, because Darwin had evidently not collected there at all. Consequently the Bindloe form cannot be called *assimilis*. The type of *assimilis*, an immature bird, came most probably from Charles Island ; the name is therefore best placed provisionally as a synonym of *G. scandens intermedia*.

23. **Geospiza scandens fatigata** Ridgw.

Geospiza fatigata, Ridgway in *Proc. U.S. Nat. Mus.* XVIII. p. 293 ; Ridgway in *Proc. U.S. Nat. Mus.* XIX. p. 539.
Geospiza barringtoni, Ridgway in *Proc. U.S. Nat. Mus.* XVII. p. 361 ; Ridgway in *Proc. U.S. Nat. Mus.* XIX. p. 541.

This form is very closely allied to *G. scandens intermedia*, but the bill and wing is generally slightly larger, and the tarsus 1 or 2 mm. longer, while the feet appear stronger and clumsier. We are not able to detect the slightest difference between specimens from Indefatigable and Barrington Islands, though we have the type of "*G. barringtoni*" and two dozen other specimens from Barrington to compare.

We have *G. scandens fatigata* from Indefatigable, Duncan, Albemarle, Jervis, Chatham, and Barrington Islands. The number of black *males* is everywhere rather small, and generally we find a much larger proportion of adult black-billed black-plumaged *males* among the few specimens of Dr. Baur's collection than among the large series collected by the Harris expedition.

Our *males* from Indefatigable Island measure : culmen, 19, 20, 20·5, 21, 22, 22·5 mm.; wing, 75—76 mm.

Those from Albemarle : culmen, 19·2—21 mm.; wing, 73—75 mm.
Those from Jervis : culmen, 19—20 mm.; wing about 73 mm.

Neither among those from Chatham nor among those from Duncan do we have any black adult *males*, but the measurements of our series from both these islands agree fully with birds in the same plumage, apparent age and sex from the other islands.

Our *males* from Barrington Island measure : culmen, 20—21 mm. ; wing, 72—75 mm. The shape of the bills of the type specimen and of some of our other specimens certainly look somewhat different, as they are plumper at the tip, but other specimens again are quite like those from the other islands.

24. **Geospiza scandens abingdoni** (Scl. & Salv.).

Cactornis abingdoni, Sclater & Salvin in *Proc. Zool. Soc. Lond.* 1870, pp. 323, 326 ; Salvin in *Trans. Zool. Soc. Lond.* IX. p. 486 (1876) ; Sharpe, *Cat. B. Brit. Mus.* XII. p. 20.
Geospiza abingdoni, Ridgway in *Proc. U.S. Nat. Mus.* XIX. p. 540.
Cactornis assimilis, Salvin, *t.c.*, p. 486, and Sharpe, *t.c.*, p. 18 (partim : Bindloe, non Gould !).

The birds from Abingdon and Bindloe are no doubt the same, and it was a mistake to identify the Bindloe birds with Gould's *Cactornis assimilis*, as Darwin never set his foot on Bindloe Island. (See remarks under *G. scandens intermedia*.)

G. scandens abingdoni is still larger than *G. scandens fatigata*, the bill is deeper, higher at base. We have, however, only a very poor series, and no perfectly adult *males*.

25. **Geospiza scandens septentrionalis** subsp. nov.

This new subspecies occurs on Wenman and Culpepper Islands. It has a very much smaller bill than any of the other forms of *G. scandens*, and is evidently a somewhat darker or rather more brownish bird, the young individuals and *females* being darker and more brownish, the wing-coverts of the *females* being broadly bordered with brownish cinnamon, not whitish. The young *males* have the borders to the upper wing-coverts much narrower than adult *females*. We have a good number of black *males*, but none with quite black beaks.

The culmina measure from 14·5 to 16·5 mm., the wings 70 to 75·5, tails about 50, tarsus 21.

Our specimens from Wenman cannot be separated from those from Culpepper. (Type No. 311, Harris coll., Wenman Island, August 4th, 1897 ; eyes brown, bill horn-colour, tarsi and feet blackish.)

26. **Geospiza pallida** (Scl. & Salv.)

Cactornis pallida, Sclater & Salvin in *Proc. Zool. Soc. Lond.* 1870, pp. 323, 327 ; Salvin in *Trans. Zool. Soc. Lond.* IX. p. 487 ; Sharpe, *Cat. B. Brit. Mus.* XII. p. 20.
Camarhynchus pallidus, Ridgway in *Proc. U.S. Nat. Mus.* XIX. p. 565.
Cactornis hypoleuca, Ridgway in *Proc. U.S. Nat. Mus.* XII. p. 109 (1890).
Camarhynchus productus, Ridgway in *Proc. U.S. Nat. Mus.* XVII. p. 364 ; Ridgway, *op. cit.* XIX. p. 566.

This is one of the most distinct species of the genus *Geospiza*. With the scanty material at the disposal of Sclater, Salvin, and Sharpe, the genera *Geospiza*, *Cactornis*, and *Camarhynchus* seemed well enough defined; and if they were, there would be no doubt that *G. pallida* belonged structurally to *Cactornis*, but not at all to *Camarhynchus*, where Ridgway placed it on account of its coloration. In

fact, in form of the bill there is not a great difference between *G. scandens* and *G. pallida*, and, as *G. scandens* (the *Cactornis* of former authors) is connected through intermediate species with *Geospiza* in the old sense, and *G. pallida* with the *Camarhynchus* in Salvin's & Sharpe's sense, it is evident that the three supposed genera cannot be separated.

G. pallida is apparently a somewhat rare species; for, although we have now thirty-nine skins before us, this seems not much, as they are from five or six islands, and there are not many adult *males* among them. Also the British and U.S. National Museum have, if we are not mistaken, only three or four skins. The adult *male* will be described below for the first time.

We have united Ridgway's *Camarhynchus hypoleucus* and *C. productus* with our *G. pallida*, the differences stated to exist between these forms evidently being of an individual nature rather than specific. The adult bird of *G. pallida* may be described as follows :—

Adult *male* : Bill horn-black. Upperside ashy grey, more brown on the lower back and rump, the centre of all the feathers blackish brown, more defined on the crown. Wings and tail deep brown with narrow, light greyish outer and wider almost white inner edges ; under wing-coverts white, with a slight yellow tinge. Underside white with a very faint buff tinge, flanks shaded and faintly striped with brown, the chest tinged with brownish buff, all the bases of the feathers blackish grey. "Iris brown, feet blackish." Wing, 76—78 mm. ; culmen, 17—18 ; tail, 47—49 ; tarsus, 23—24. In some skins, especially in one almost adult *male* from Albemarle Island, the culmen does not exceed 15 mm. in length, the wing not 75 mm. ; but as there are all intergradations between these and others, the smaller size cannot be considered as a specific character.

Adult *female* : Like the adult *male*, but (? always) slightly more brownish and more uniform above ; dimensions smaller. Wing, 73—74 mm. ; culmen, 16 mm.

The birds which are olive above and buffish yellow below are immature ones, but it is somewhat puzzling to account for the distinct blackish brown stripes on the lower throat, chest, and sides of the body in some of them. Neither the apparently most adult ones, nor the most yellowish, and therefore, according to our view, youngest of our series, have these stripes well developed. These striped birds may be the *females*, but in that case several of our birds from different collections would be wrongly sexed.

We have *G. pallida* from Indefatigable, Jervis, Duncan, James, and Albemarle Islands.

There is also a skin taken out of a jar of spirits said to contain Chatham Island birds only, collected by Messrs. Baur & Adams, but we are inclined to believe that this specimen has by mistake found its way into the Chatham jar.

27. **Geospiza crassirostris** (Gould).

Camarhynchus crassirostris, Gould in *Proc. Zool. Soc. Lond.* 1837 p. 6 ; *Zool. Voy. Beagle*, III. Birds, p. 103, pl. XLI. (1841) ; Salvin in *Trans. Zool. Soc. Lond.* IX. p. 489 ; Sharpe, *Cat. B. Brit. Mus.* XII. p. 16 (1888) ; Ridgway in *Proc. U. S. Nat. Mus.* XIX. p. 551.

Camarhynchus variegatus, Sclater & Salvin in *Proc. Zool. Soc. Lond.* 1870, pp. 323, 324, fig. 2 ; Salvin in *Trans. Zool. Soc. Lond.* IX. p. 489, pl. 85 (1876) ; Sharpe, *Cat. B. Brit. Mus.* XII. p. 15 ; Ridgway in *Proc. U.S. Nat. Mus.* XIX. p. 549.

There can be no doubt, in our opinion, that *Camarhynchus variegatus* is a synonym of *C. crassirostris*, since specimens from Charles Island, and the other

islands whence the type of *C. crassirostris* might have come, do not differ from those of Abingdon and Bindloe, where the type of *C. variegatus* had been found, and since we find some birds from several of the islands inhabited by this form to agree with the type of *C. crassirostris*.

We have already given our reasons for uniting the genera *Geospiza* and *Camarhynchus*.

We have before us specimens of *G. crassirostris* (= *variegatus*) from Charles, Chatham, Indefatigable, James, Albemarle, Jervis, Duncan, Abingdon, and Bindloe Islands. From several of these we have no black-throated adult *males*. Descriptions of this species are given by Sclater & Salvin, Sharpe, and the most complete by Ridgway, *l.c.* 1897.

The types of *G. variegatus* were procured on Abingdon and Bindloe. Mr. Townsend did not find it there, nor did Messrs. Baur & Adams come across it, and therefore Dr. Baur doubted the locality, declaring that "it was certainly not true" that *G. variegatus* and *G. habeli* were found simultaneously on Bindloe and Abingdon; but we shall see that it is nevertheless true that these forms occur together.

Ridgway (*l.c.*) reprints the three descriptions purporting to have been taken from the same specimen, "the type," now in the British Museum. We have compared the latter also, but we do not think that it is the type at all! This will account for the discrepancies in the various published descriptions. The type of *G. crassirostris*, according to the descriptions and figure of Gould, and in the *Voyage of the Beagle*, had no black crown, sides of head and ear-coverts, while the supposed type now in the British Museum has these parts black, as described by Salvin, *l.c.*

It would perhaps seem that Sharpe (*l.c.*) had again the real type, without a black head, before him when he wrote Vol. XII. of the *Catalogue of Birds*, but the shortness of his description leaves it doubtful.

28. **G. psittacula psittacula** (Gould).

Camarhynchus psittaculus, Gould in *Proc. Zool. Soc. Lond.* 1837, p. 6; *Zool. Voy. Beagle*, III. Birds, p. 103, pl. XL.; Salvin in *Trans. Zool. Soc. Lond.* IX. p. 488; Sharp, *Cat. B. Brit. Mus.* XII. p. 16; Ridgway in *Proc. U.S. Nat. Mus.* XIX. p. 552.

Camarhynchus rostratus, Ridgway in *Proc. U.S. Nat. Mus.* XVII. p. 363 (James Island).

Camarhynchus compressirostris, Ridgway in *Proc. U.S. Nat. Mus.* XVIII. p. 294; XIX. p. 558 (Jervis Island).

The type of *G. psittacula* (Gould) is said to have come from James Island. We consider the birds from James, Indefatigable, Barrington, Jervis, and Duncan to belong to the same form, while we are somewhat doubtful with regard to those from Charles Island. We have also one very young bird from Chatham, of which it is impossible to say with certainty whether it belongs to *G. psittacula psittacula* or not, but which does not disagree with the latter.

(?) 29. **Geospiza psittacula townsendi** (Ridgw.)

Camarhynchus townsendi, Ridgway in *Proc. U.S. Nat. Mus.* XII. p. 110 (1890).

We have only four skins from Charles Island, and they are all *females*. Three of them have black bills, a character not to be seen in our (apparently) adult *females* from other islands. The bill seems a little higher, the upper jaw especially, than in specimens from other islands.

We enumerate these Charles Island specimens provisionally as a subspecies of *G. psittacula*, but we do not consider it an established form, as a better series may prove its identity with *G. psittacula psittacula*.

30. **Geospiza affinis** (Ridgw.)

Camarhynchus affinis, Ridgway in *Proc. U.S. Nat. Mus.* XVII. p. 365 (1894) ; XIX. p. 554.

The form from Albemarle and Narborough Islands differs so much from *G. psittacula* in its smaller size, especially of the bill and wings, that we, for the present, allow its specific rank. The "rather broadly and distinctly streaked breast" of the type, which is before us, is no specific character, since it is found in a number of immature *G. psittacula* and other allied forms.

Adult *males* with black bills have the entire head, neck and chest black, the black colour developing into broad streaks on the sides of the breast. The culmen of adult *males* is 12·5—13·5 mm., the wing 68—72.

31. **Geospiza incerta** (Ridgw.)

Camarhynchus incertus, Ridgway in *Proc. U.S. Nat. Mus.* XVIII. p. 294, XIX. p. 560.

Three skins before us from James Island, one of them the type, belong no doubt to the form called by Mr. Ridgway *C. incertus*. They are very closely allied to *G. affinis*, in fact hardly differ from the latter at all, except by their apparently smaller bills. The culmen measures 12—13 mm., but probably not one of these specimens is adult. One of them is marked *male*, and its beak is very dark, almost black, marked by the collector on the label as "blackish, lighter below," but, although being darker on the head than the others, especially on the lores and ear-coverts, it wants the black head.

Five specimens from Duncan are not separable from those from James Island, but they are also *females* or immature *males*, and adult *males* would be necessary to finally settle their relationship.

We have seen that the specimens from Jervis Island, which lies in the middle between James and Duncan Islands, are true *G. psittacula*. Therefore, if the Duncan and James birds are the same, we should probably find it also on Jervis Island. Much better material is required to decide whether *G. incerta* can be separated from *G. affinis* or not.

32. **Geospiza habeli** (Scl. & Salv.)

Camarhynchus habeli, Sclater & Salvin in *Proc. Zool. Soc. Lond.* (1870) pp. 323, 325, fig. 3 in text ; Salvin in *Trans. Zool. Soc.* IX. p. 490, Pl. XXXVI. (1876) ; Sharpe, *Cat. B. Brit. Mus.* XII. p. 17 (1888) ; Ridgway in *Proc. U.S. Nat. Mus.* XIX. p. 555.
Camarhynchus bindloei, Ridgway in *Proc. U.S. Nat. Mus.* XVIII. p. 294 (1896), XIX. p. 556.

G. habeli from Bindloe and Abingdon is a very distinct form, the bill being rather deep, the height at base being almost or fully equal to the distance from nostril to tip of upper jaw. Length of culmen 15·5—16 mm., wing 74—76 mm.

We have examined, besides those in the British Museum, twelve skins from Bindloe and thirteen from Abingdon, including the type of *C. bindloei*, but we cannot recognise any differences between the birds from the two islands.

33. **Geospiza paupera** (Ridgw.)

Camarhynchus pauper, Ridgway in *Proc. U.S. Nat. Mus.* XII. p. 111, XIX. p. 559.

It seems strange that this species was not found by Darwin and Baur and Adams. The "*Albatross*" had obtained, it seems, three specimens, while our recent expedition has obtained a full dozen, among which, however, there is only one *male* with the head and throat chiefly black. The culmen of our oldest birds with black bills measures about 12·9—13·5, the wing about 69—73 mm.

G. paupera is evidently a good species, its bill being somewhat stout and at the same time elongated, much less high than it is in *G. psittacula* and allies.

It is only known from Charles Island.

34. **Geospiza salvini** (Ridgw.)

Camarhynchus salvini, Ridgway in *Proc. U.S. Nat. Mus.* XVII. p. 364, XIX. p. 561.

The small curved-billed *Geospiza* from Chatham Island is apparently very yellowish and buffish in all ages, and much larger than *G. prosthemelas*. Mr. Ridgway has, besides seven skins in Dr. Baur's collection, examined eleven specimens procured by Mr. Townsend, naturalist of the U.S. Fish Commission steamer "*Albatross*." We have before us altogether sixty-three skins, sixteen from the Baur collection, forty-seven from the Harris expedition. Among these seventy-four skins thus seen by ornithologists, there is not a single black-headed individual. As the birds shot by Mr. Townsend were procured in March, Dr. Baur's in August and September, Mr. Harris' in October, we may perhaps conclude that this species does not assume a black head and throat at all; but this is by no means certain, and it will be most valuable to see specimens killed between October and March, and between March and August. The adult *male*—if we presume it has never a black head—is black-billed, streaked with black on the sides of the breast, these streaks being produced by the arrow-shaped black markings in the middle of the feathers, and agrees with Mr. Ridgway's description, *l.c.* The culmen measures 11·5—12 mm., the wing 66—67 mm. The adult *female* is like the adult *male*, but slightly smaller, the culmen not above 11—11·5, the wing 63—65 mm.; the sides of the breast are less streaked, the arrow-shaped black markings in the middle of the feathers being indistinct. Some of the young birds are very boldly streaked on the underside, the black markings being less arrow-shaped and reaching to the tip of the feathers, while others are hardly streaked at all. Most of the latter being marked "♀," we suppose they are all *females*. The strongly yellowish tint of *G. salvini* in all ages is very conspicuous if a series is compared with any of the other species, but some young *G. prosthemelas* have exactly the same colour.

35. **Geospiza prosthemelas** (Scl. & Salv.)

Camarhynchus prosthemelas, Sclater & Salvin in *Proc. Zool. Soc. Lond.* 1870, pp. 323, 325, fig. 4 (type from Indefatigable Island); Salvin in *Trans. Zool. Soc. Lond.* IX. p. 490 (1876); Sharpe, *Cat. B. Brit. Mus.* XII. p. 17 (1888); Ridgway in *Proc. U.S. Nat. Mus.* XIX. p. 563.

As far as our material enables us to judge, we consider at present the forms from the following islands to be what we call *Geospiza prosthemelas* (Scl. & Salv.)

1. Indefatigable Island. We have before us twenty-nine skins, collected in

August, September and October, nearly all marked as *females*, none with black beak or black head.

2. Duncan Island. Nine skins, no black-billed or black-headed specimen. September.

3. Albemarle Island. Twenty-three skins, among them six black-headed *males*. Shot in July (Baur), and November (Harris, etc.)

4. Narborough Island. Four skins, one black-headed. December.

5. James Island. Twenty-six skins, five black-headed *males*; none with black bill. All shot in August, September and October.

6. Jervis Island. Twelve skins; none black-headed. August and September.

7. Charles Island. Twenty-seven skins, of which seventeen are more or less black-headed and black-throated. All these latter are marked "♂"; the *female* therefore does not seem to assume a black head. All November.

8. Gardner Island (near Charles). Five, all young.

9. Barrington Island. Three young individuals.

10. Cowley Island (east of Albemarle). One young individual (Baur coll.). It is most peculiar that Ridgway had also black-headed individuals from James and Charles Islands only; but no doubt the black heads are only seasonal, although ours from Charles Islands are all killed in November, Ridgway's in April.

G. prosthemelas is the smallest form of the curved-billed *Geospizae* (*Camarhynchus* of Gould, Salvin, Sharpe, Ridgway), and young birds with little curved bills are sometimes easily mistaken for very young *G. fuliginosa*, while others are very yellowish, so as to resemble *G. salvini*.

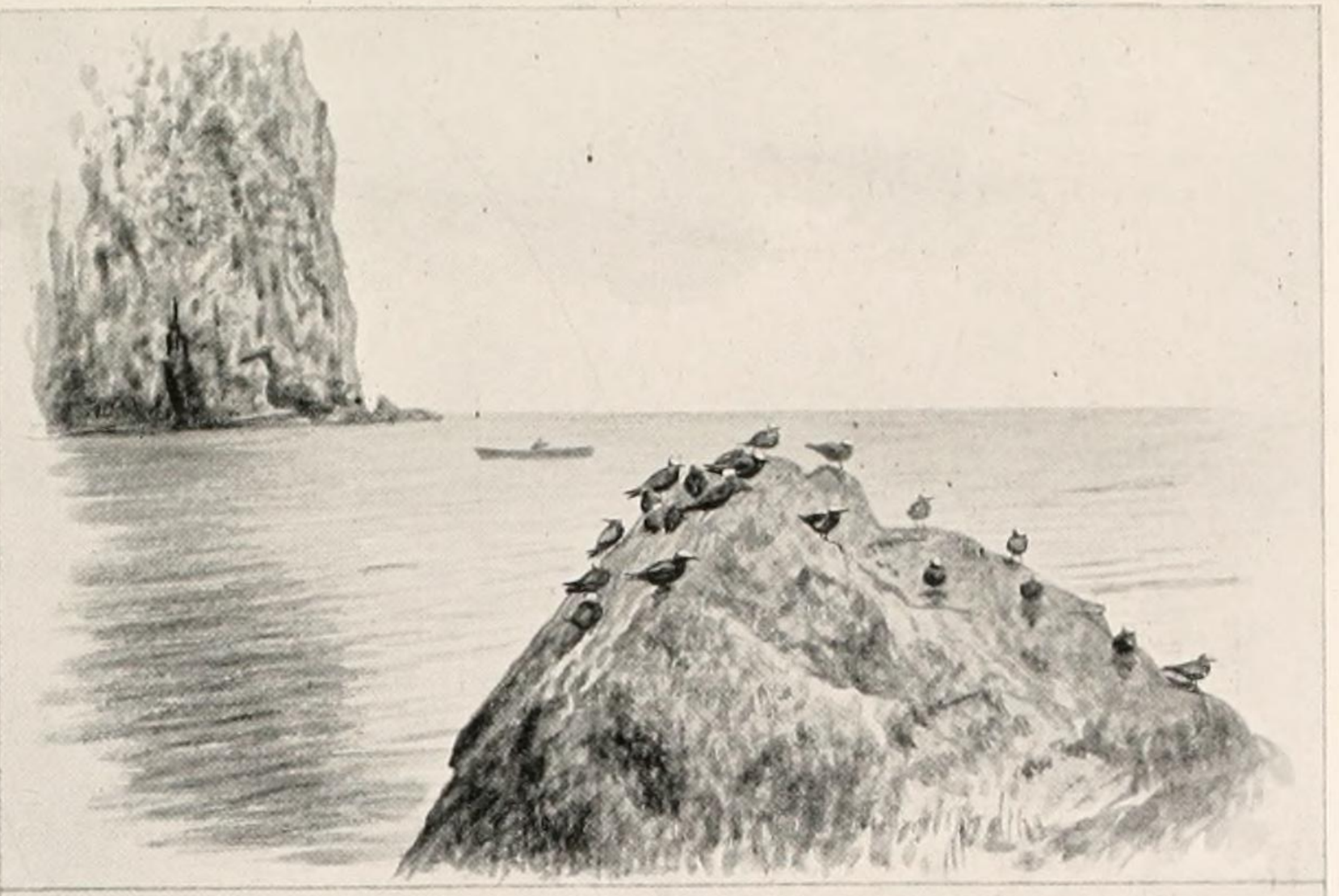
EXPLANATION OF PLATE VI.

Fig. 1.	*Geospiza strenua*.	Bindloe I.	♂ ad. Aug. 1897 (No. 706).
„ 2.	„	„	„	♂ ad. Sept. 1891 (Baur coll.).
„ 3.	„	„	„	♀ med. Aug. 1897 (No. 726).
„ 4.	„	„	James I.	♀ ad. Aug. 14th, 1891 (Baur coll.).
„ 5.	„	„	„	♀. Sept. 1897 (No. 1364).
„ 6.	„	„	„	♀. Sept. 1897 (No. 1323).
„ 7.	„	„	Tower I.	♂ ad.! Dec. 1897 (No. 2985).
„ 8.	„	„	„	? ♀ ad. Sept. 1891 (Baur coll.).
„ 9.	„	„	„	♀ ad. Dec. 1897 (No. 2888).
„ 10.	„	„	Jervis I.	♂ ad.! Sept. 1897 (No. 1205).
„ 11.	„	„	„	♀. Aug. 1891 (Baur coll.).
„ 12.	„	„	„	♂ jun. Aug. 1891 (No. 474, Baur coll.).
„ 13.	„	„	Albemarle I.	♂ ad.! July 1891 (Baur coll.).
„ 14.	„	„	„	♂ ad. July 1891 (Baur coll.).
„ 15.	„	„	„	♀ juv. July 1891 (Baur coll.).
„ 16.	„	„	Indefatigable I.	♂ quite young, Aug. 1891 (Baur coll.).

These 16 figures are given to show the variation within one form, according to age and sex. Figures 1, 4, 7, 8 and 10 show about the largest bills in our series, while figures 15 and 16 show the smallest, both being young birds. Figures 17 to 20 show also the variation within one form, while figures 21 to 39 show the bills of typical individuals of some of the other forms.

1

2.



3

4.

1. ALBATROSSES (DIOMEDEA IRRORATA) ON HOOD ISLAND.
3. PHAETHON AETHEREUS ON ITS NEST, HOOD ISLAND

2. ANOUS STOLIDUS GALAPAGENSIS ON HOOD ISLAND.
4 AMBLYRHYNCHUS CRISTATUS, HOOD ISLAND

Lith Anst v. E. A. Funke, Leipzig

BILLS OF THE GENUS GEOSPIZA.

Fig. 17. *Geospiza conirostris.* ♂ ad ! Hood I. 1891 (Baur coll.)
„ 18. „ „ ♂ fere ad. Hood I. Oct. 1897 (No. 2913).
„ 19. „ „ ♂ jun. (but black). Oct. 1897 (No. 1909).
„ 20. „ „ ♂ jun. „ „ (No. 1962).
„ 21. „ *darwini.* ♂ ad. (type). Culpepper I. July 1897 (No. 157).
„ 22. „ *dubia.* ♂ ad. Chatham I. June 1891 (No. 78, Baur coll.).
„ 23. „ *dubia albemarlei.* ♂ ad. Albemarle I. Nov. 1891 (No. 2468).
„ 24. „ *bauri.* ♂ ad. (type). James I. Aug. 1891 (No. 562, Baur. coll.).
„ 25. „ *psittacula.* ♂ ad. James I. Sept. 1897 (No. 1287).
„ 26. „ *habeli.* ♂ ad. Bindloe I. Aug. 1897 (No. 703).
„ 27 „ *crassirostris.* ♂ ad. Albemarle I. July 1891 (Baur coll.).
„ 28. „ *fortis.* ♂ ad. Charles I. Nov. 1897 (No. 2239).
„ 29. „ *debilirostris.* ♂ (black, but bill not). James I. Nov. 1897 (No. 1352).
„ 30. „ *paupera.* ♂ Charles I. Nov. 1897 (No. 2349).
„ 31. „ *prosthemelas.* ♂ ad. Charles I. Nov. 1897 (No. 2217).
„ 32. „ *fuliginosa.* ♂ ad. Jervis I. Aug. 1891 (Baur coll.).
„ 33. „ *difficilis.* ♂ ad. Abingdon I. Aug. 1897 (No. 571).
„ 34. „ *pallida.* ♀. Jervis I. Nov. 1897 (No. 1111).
„ 35. „ „ ♀. James I. Aug. 1891 (Baur coll.).
„ 36. „ „ ♂ ad. James I. Nov. 1891 (No. 1280).
„ 37. „ *scandens intermedia.* ♂ not ad. Gardner I. Oct. 1897 (No. 2112).
„ 38. „ „ „ ♂ ad. ! Charles I. Nov. 1897 (No. 2365).
„ 39. „ *acutirostris.* ♂ ad. Tower I. Dec. 1897 (No. 2907).

Genus DOLICHONYX Swains.

Dolichonyx, Swainson in *Phil. Mag.* 1827, p. 435.

Eastern parts of North America ; in winter over great portions of eastern South America.

1. **Dolichonyx oryzivorus** (L.).

Fringilla oryzivora, Linnaeus, *Syst. Nat.* ed. X. p. 179 (1758).
Dolichonyx oryzivorus, Darwin *Zool. Beagle*, III. Birds, p. 106 ; Salvin in *Trans. Zool. Soc.* IX. p. 491 ; Ridgway in *Proc. U.S. Nat. Mus.* XIX. p. 567.

The bobolink had been found by Darwin on James Island. The Harris expedition obtained a young *male* on Charles and a *female* on Chatham Island, the former in November, the latter in October and several others were seen. They are, of course, stragglers from North America.

Genus MYIARCHUS Cab.

Myiarchus Cabanis in Tschudi's *Fauna Peruana*, Aves, p. 152 (1845).
Eribates, Ridgway in *U.S. Nat. Mus.* XVI. p. 606 ; XIX. p. 568.
Despotina Kaup 1851, *Myionax* Cabanis & Heine 1859, *Onychopterus* Reichenbach 1850, *Kaupornis* Bonaparte 1850 are synonyms of *Myiarchus* according to Sclater, *Cat. B. Brit. Mus.* XIV. p. 246 (1888).

We do not see a necessity to deviate from Dr. Sclater's view of the genus *Myiarchus*, and if limited according to the latter author we cannot see how *Eribates*

of Ridgway can be recognised, especially if compared with *M. nigriceps* of Ecuador. Ridgway himself only created the name *Eribates* as a subgeneric term, but does not use it.

1. **Myiarchus magnirostris** (Gray).

Myiobius magnirostris, Gray in *Voy. Beagle*, III. Birds, p. 48 (1841).
Tyrannula magnirostris, *t.c.* Pl. VIII.
Myiarchus magnirostris, Salvin in *Trans. Zool. Soc. Lond.* IX. p. 493 ; Sclater, *Cat. B. Brit. Mus.* XIV. p. 262 (1888) ; Ridgway in *Proc. U.S. Nat. Mus.* XIX. p. 569.

We have this species from the following islands : Chatham, Charles, Gardner, Hood, Barrington, James, Duncan, Indefatigable, Jervis, Albemarle, Narborough, Abingdon and Bindloe, and one caught on the vessel off Wenman Island.

There are no differences between any of these, except that those from Chatham seem to have the wing about 2—4 mm. shorter. As, however, we have only one fresh skin and two from spirits (the type in the British Museum being of doubtful origin), we cannot maintain that this character is of specific or subspecific value. A larger series would be necessary to show the value of this peculiarity.

The *female* is considerably smaller than the *male*, with the wing about 5 mm. shorter. There is generally a little less cinnamon-rufous on the inner webs of the rectrices, but other differences in colour are not to be seen.

Genus PYROCEPHALUS Gould.

Pyrocephalus, Gould in *Voy. Beagle, Zool.* III. Birds, p. 44 (1841) ; Sclater, *Cat. B. Brit. Mus.* XIV. p. 211.

This genus is most closely allied to *Myiobius*, from which it hardly differs in structure, except by its somewhat more elongated bill and less developed rictal bristles, but the coloration of the *males* makes all its members very conspicuous.

The genus is absent from the West Indies, but spread over the whole of South America, from Southern Florida through Central America to Argentina, and is frequent on the Galapagos Islands.

Only two forms can be distinguished in the Galapagos Archipelago, the forms separated by Ridgway on account of certain alleged differences in colour not being recognisable.

1. **Pyrocephalus nanus** Gould.

Pyrocephalus nanus, Gould, *Zool. Beagle*, III. Birds, p. 45, Pl. VII. (1841) ; Ridgway in *Proc. U.S. Nat. Mus.* XIX. p. 572.
Pyrocephalus intercedens, Ridgway in *Proc. U. S. Nat. Mus.* XVII. p. 366 ; XIX. p. 575.
Pyrocephalus carolensis, Ridgway in *Proc. U. S. Nat. Mus.* XVII. p. 365 ; XIX. p. 576.
Pyrocephalus abingdoni, Ridgway in *Proc. U. S. Nat. Mus.* XVII. p. 367 ; XIX. p. 578.

This species differs from *P. rubineus* of South America and *P. mexicanus* of Central America in its much smaller size and the coloration of the *female*, which is broadly striated on the breast in *P. rubineus* and *P. mexicanus*, but only faintly or not at all distinctly streaked on the breast in *P. nanus*.

The type of *P. nanus* is only known to have come from the "Galapagos Islands," but the exact island where it was procured is not known. Ridgway restricts its habitat to **James** Island. From this island we have twenty-four skins, about half of them being *males*. From **Indefatigable** Island we have thirty-six

skins, and we do not find the slightest difference from those from James. The *female* is, according to Ridgway, brighter yellow beneath, browner above, and the top of the head more tinged with yellow. These characters may have been visible in what we should have called the type,* but they are only of an individual nature, as we find *P. nanus* to vary very much in the depth of the colour, freshly moulted specimens differing from bleached ones, and young *males* running through many shades of colour. From **Albemarle** we have sixteen specimens, but only five adult *males*. Neither *males* nor *females* differ at all from those from James and Albemarle Islands. From **Duncan** we have nineteen skins, nine *females* and immature *males*, and nine adult *males*. They do not differ from those from James, Indefatigable, and Albemarle Islands. One adult *male* and three young *males* from **Jervis** are like the former. From **Charles** Island we have not less than forty-two skins, and we do not find them to differ in any way from the former. The alleged differences of *P. carolensis* do not exist. The same must be said of those of **Abingdon** and **Bindloe** Islands. From the latter we have six adult *males* and three *females*; from the former two *males* and one *female*. The underside of the *males* is extremely variable in colour, being much brighter and more vermilion after the moult, more scarlet in others, and sometimes orange-chrome-yellow. The latter is especially the case with most of Dr. Baur's specimens, which look as if they had been partially immersed in spirits for a short time, or had been in contact with some other chemical. The specimen from Bindloe, mentioned by Ridgway on p. 578 (*l.c.*), which has the throat and chest pure scarlet and the breast and abdomen abruptly "pale saturn red," is probably in some way partly discoloured. As its right side is not quite like the left side, it should have convinced Mr. Ridgway that these shades of colour are not of any specific value. Our other *male* from Bindloe is totally different from the one in Dr. Baur's collection.

We have, besides the above-mentioned skins, many examples in spirits, but they are useless as skins, the colour being entirely gone.

2. **Pyrocephalus dubius** Gould.

Pyrocephalus dubius, Gould, *Voy. Beagle*, Birds, III. p. 46; Ridgway in *Proc. U.S. Nat. Mus.* XVII. p. 368 (1894); XIX. p. 579.
Pyrocephalus minimus Ridgway in *Proc. U.S. Nat. Mus.* XII. p. 113 (1890).[1]

This species inhabits **Chatham** Island only. It differs from *P. nanus* in being considerably smaller, the wing about 4 or 5 mm. shorter, the tail at least 5 or 6 mm. shorter. The *males* do not seem to become so bright scarlet beneath as those of *P. nanus*. The *female* has a broad and conspicuous superciliary stripe, is much more ochraceous buff beneath than the *females* of *P. nanus*, and the throat is not so pale and not in such a sharp contrast to the breast.

Genus COCCYZUS Vieill.

Coccyzus, Vieillot, *Analyse*, p. 28 (1816).

"Temperate and tropical America generally."

* No. 418 of Dr. Baur's collection, Indefatigable Island, August 5th, 1891, an adult *male*, is marked as the type of *P. intercedens* by Ridgway, but as the alleged differences have apparently only been noticed in the *female*, the latter should be the real type of *P. intercedens*.

1. **Coccyzus melanocoryphus** Vieillot.

Coccyzus melanocoryphus Vieillot in *Nouv. Dict. d'Hist. Nat.* VIII. p. 271 (1817) ; Shelley, *Cat. B Brit. Mus.* XIX. p. 307 (1891) ; Ridgway in *Proc. U.S. Nat. Mus.* XIX. p. 587.

We have received specimens from Chatham and Charles Islands, collected by Messrs. Baur & Adams and the Harris' expedition in the months of September, October, and November. Dr. Baur (*Amer. Naturalist*, 1897, p. 782) obtained it also on Albemarle, but the specimen has been lost in Guayaquil.

We cannot separate these birds from continental specimens. They have generally a very stout beak and much black about the face, but many continental skins do not differ at all.

Genus BUTEO Cuv.

Buteo, Cuvier, *Leç. Anat. Compar.* I. Ois. (1800).

Nearly cosmopolitan.

1. **Buteo galapagoensis** (Gould).

Polyborus galapagoensis, Gould in *Proc. Zool. Soc.* 1837. p. 9.
Craxirex gal., Gould, *Zool. Voy. Beagle*, III. Birds, p. 23. Pl. II. (1841).
Buteo gal., Ridgway in *Proc. U.S. Nat. Mus.* XIX. p. 587.
Buteo galapagensis, Sharpe, *Cat. B. Brit. Mus.* I. p. 170 (1874).
But. galapagensis, Salvin in *Trans. Zool. Soc.* IX. p. 495.
Buteo leucops, Gray, *Cat. Accipitr. Brit. Mus.* p. 36 (1848).
Poecilopternis infulatus, Kaup, *Contr. Orn.* p. 76 (1850).

The buzzard of the Galapagos Islands is apparently closely allied to the North American *B. swainsoni*, but has much larger feet and bill, and is generally larger. The *female* is larger than the *male*.

We have thirteen specimens in the light phase (ochraceous beneath) and eleven in the dark phase (almost uniform dark sooty brown). According to Mr. Ridgway only dark-coloured adults have hitherto been taken. We do not believe that our light-coloured specimens are all young. They are killed at the same time as the adults, are of both sexes, all equally coloured, those in fresh plumage are much brighter, those in worn dress paler, and in two moulting specimens the new feathers are of the same colour as the old ones. In none of the dark birds can we find actual remains of the light plumage, and the series of light ones does not look like being young birds. We are therefore inclined to believe that this buzzard occurs in a dark and in a light phase, like *Buteo swainsoni*.

The buzzard is now known to occur on the following islands :—Chatham, Albemarle, Duncan, Hood, Indefatigable, Barrington, Bindloe, Abingdon, James and Jervis. It seems to be absent from Charles Island.

A well incubated egg, which was not saved, was found on September 1st on Indefatigable, another fresh one on August 13th on Abingdon Island. The egg is greenish white, very much like that of the goshawk, without gloss and without any markings. It measures 57·2 by 45·3 mm. The nest is composed of sticks and substantially lined with grass. It was placed in a " tree-cactus " 10 feet from the ground.

Genus STRIX L.

Strix, Linnaeus, *Syst. Nat.* ed. X. p. 92 (1758).

1. **Strix punctatissima** Gray.

Strix punctatissima, Gray, *Zool. Voy. Beagle*, III. Birds, p. 34, Pl. IV. (1841); Salvin in *Trans. Zool. Soc. Lond.* IX. p. 494; Sharpe, *Cat. B. Brit. Mus.* II. p. 297 (1875); Ridgway in *Proc. U.S. Nat. Mus.* XIX. p. 583.

The barn-owl of the Galapagos Islands is the dwarf of the genus, and of a very dark coloration. It is evidently restricted in its range to the Galapagos Islands. Statements of its occurrence on the continent of South America are doubtless erroneous. It has been said to occur at Para (Strickland's *Orn. Synonyms*, p. 182), but the specimen on which this assertion had been founded is the Australian *S. castanops* (Salvin, *l.c.*). The birds said to be "rather abundant in the valley of Quito" (Orton, *Amer. Nat.* IV. p. 711) belong probably to the form described by Hartert as *S. flammea contempta* (Nov. Zool. V. p. 500), which resembles the Galapagos species (or subspecies) a good deal in coloration, but is much larger. (Wing 310 mm., in *S. punctatissima* only 220 mm.)

Only Darwin and Habel seem to have procured specimens of this owl, while neither Townsend nor Baur & Adams met with it. Harris believes that he heard it several times, and that he saw it, on Chatham Island, but unfortunately no specimen was procured.

Genus ASIO Briss.

Asio, Brisson, *Orn.* I. p. 28 (1760).

Nearly cosmopolitan.

1. **Asio galapagoensis** (Gonld).

Brachyotus galapagoensis, Gould in *Proc. Zool. Soc. Lond.* 1837, p. 10.
Otus galap., Gould, *Zool. Voy. Beagle*, III. p. 32, Pl. III.
Asio galap, Sharpe, *Cat. B. Brit. Mus.* II. p. 238 (1875); Ridgway in *Proc. U.S. Nat. Mus.* XIX. p. 585.
Asio galapagensis, Salvin in *Trans. Zool. Soc.* IX. p. 493 (1876).

This owl is particularly interesting, being apparently the only known near ally of the short-eared owl, which has a nearly—though not strictly—cosmopolitan distribution. The authors quoted above have given accurate descriptions of this species.

Ridgway has named Albemarle, Hood, Indefatigable, James, Tower and Bindloe Islands as its homes. We have also specimens from Duncan (common), Barrington (common), Chatham and Gardner Islands. It was also observed on Culpepper Island, but it has never been obtained on Charles Island.

Genus FREGATA Briss.

Fregata, Brisson, *Orn.* VI. p. 506 (1760).

Intertropical seas.

1. **Fregata aquila** (L.).

Pelecanus aquilus, Linnaeus, *Syst. Nat.* ed. X. I. p. 133 (1758).
Fregata aquila and *Fregata aquila minor*, Ridgway in *Proc. U.S. Nat. Mus.* XIX. pp. 590, 591.
Fregata aquila, Grant, *Cat. B. Brit. Mus.* XXV. p. 443.

Ridgway and Grant have quite correctly accepted the name *F. ariel* for the small species found in the South Pacific and Indian Oceans, from Madagascar

to Australia and the Society Islands, and recognised *F. minor* (*Pelecanus minor* Gmelin), as given to small specimens of the common large species, *F. aquila* (L.). On the other hand Ridgway (*l.c.*) raises the question whether *F. aquila minor* is worthy of recognition as a separate form from true *F. aquila aquila*, or not. If so, the small form would be an occasional visitor to the Galapagos, while *F. aquila aquila* would be of regular occurrence according to Ridgway.

Our material from the Galapagos proves that the **small** form is resident on the islands, and, we think, it proves also that the large and small form completely intergrade in the same colonies, and that therefore they are not separable as subspecies.

On Culpepper, Wenman, Tower, Gardner and Hood Islands they were found breeding. On Indefatigable, Duncan, Jervis, James, Chatham, Barrington, and Albemarle Islands they were found to be common, and they were also seen on Abingdon, Charles, Bindloe, and Narborough Islands. The *males* vary in the two principal measurements as follows :

♂ ad. Culpepper. Bill from gape to tip in a straight line 116, 112, 110 mm., wing 580, 580, 548 mm.

♂ ad. Barrington. Bill, as above, 125, wing 645 mm.

♂ ad. Tower. Bill, as above, 130, wing 660 mm.

♀ ad. Culpepper. Bill, as before, 135, wing 600, 610 mm.

♀ ad. Wenman. Bill, as before, 158, wing 690 mm.

It is evident, and known, that the *females* are, as a rule, much larger than the *males*, but the Wenman *female* is a very large specimen.

The following note is on the label of this large *female*. " Wenman Island, ♀, August 4th, 1897. Length 42·50 in., extent 96 in. Iris dark brown, feet madder red, tarsi paler, bill horn-colour, gular sac and eyelids indigo blue. This bird is coloured entirely different from anything seen so far." We do not find anything extraordinary in these notes, the *males* only having a red gular sac, this being blue in the *females*.

The differences stated by Ridgway to exist in coloration—viz., that in the smaller birds the plumage is more glossy, and the back brilliant green mixed with purple, instead of the reverse—do not hold good, and are merely of an individual character.

The nests, composed of some sticks and placed in low bushes, contained one egg each. On Wenman they were fresh in the first week of July.

Genus PELECANUS L.

Pelecanus, Linnaeus, *Syst. Nat.* ed. X. I. p. 132.

Tropical and temperate regions of the world, but absent from the Pacific islands and other maritime groups of islands far from the mainland or other large islands.

1. **Pelecanus fuscus californicus** Ridgw.

Pelecanus (*fuscus ?*) *californicus*, Ridgway in Baird, *Brewer & Ridgway's Water-Birds of North America*, II. p. 143 ; *id.*, *Man. North Amer. B.* p. 82 (1887) ; *id.* in *U.S. Nat. Mus.* XIX. p. 593 ; Grant, *Cat. B. Brit. Mus.* XXV. p. 478.

We quite agree with Mr. Grant, that the changes of plumage and the measurements are generally quite the same in *P. fuscus* and *P. californicus*, and that the reddish colour of the basal portion of the gular sac during the breeding season is

the only character to distinguish them by, if indeed correct. Unfortunately this peculiarity cannot often be seen in skins. However, although the measurements are often the same, we have not seen such small individuals as Mr. Hartert shot on Aruba, from the west coast of America, for example, from California and central America, or from the Galapagos Islands. All specimens from the west coast are large, and those from the Galapagos group do not, as a rule, excel those from farther north.

We have received this pelican from Albemarle, and Abingdon Islands only, but they were seen near and on some of the other isles. A nest with three eggs was found among the mangroves on Indefatigable Island, on September 3rd. The eggs are like those of other pelicans, measuring 78·5 by 51, 78·5 by 50·5, and 72 by 52·5 mm.

Genus SULA Briss.

Sula, Brisson, *Orn.* VI. p. 495 (1760).

Temperate and tropical seas.

1. **Sula piscatrix websteri** Rothsch.

Sula piscator, Ridgway in *Proc. U.S. Nat. Mus.* XIX. p. 598.
Sula websteri, Rothschild in *Bull. B. O. Club*, VII. p. 52 (May 1898); Grant, *Cat. B. Brit. Mus.* XXVI. p. 655 (quotation only).

When Mr. Rothschild described this form, as *S. websteri*, sp. n., in the *Bull. B. O. Club*, VII. p. 52, we had only a few specimens, but now we have before us three dozen of them, of which twenty-four are in the white plumage. They are mostly from Clarion Island, only six, in various plumages, from the Galapagos group.

The original diagnosis reads as follows :—

"Adult, in white plumage, closely resembling *S. piscatrix*, having the same hoary-grey on the primaries, but at once distinguishable by its dark brownish-grey tail ; the bill is also more slender, and the red at the base of the mandible is more extended. Young in grey plumage somewhat variable, very different from the young of *S. piscatrix*, being not so dark above, and the feathers of the back uniform brown, not edged with light grey ; below darker than the young of *S. piscatrix*. Size of *S. piscatrix*."

Hab. Clarion Island, Galapagos, and the neighbouring seas.

Comparing now our series with a large series from the North Pacific and from the West Indian Islands, we find that none of those ever has a brownish-grey tail when in the white breeding-plumage, nor do we find it described in that plumage from anywhere else. Out of our twenty-four white birds from Clarion and the Galapagos Islands, however, only **one** has a white tail, and two others have brownish-grey tails with some admixture of white. All the other twenty-one white-plumaged adult birds, all in breeding plumage, mostly taken from their nests, have the tail brownish grey or greyish brown, with whitish tips to the middle rectrices. In addition to this remarkable character we find that the average measurements of the wing are longer, *S. piscatrix piscatrix* having the wing about 15—15·5, seldom 15·7—15·8 in., *S. piscatrix websteri* 16—16·5 in. in length. The other differences stated in the original description of *S. websteri* are not constant when examining a larger series. The bird considered then to be "young" is not in the first plumage. We have now young birds which are like those from other countries, although perhaps a little darker. It is remarkable that such a large proportion of

brown birds are found in the Galapagos Archipelago. They are, although not in their first plumage, immature birds, and would, no doubt, assume their white garment a year or two later.

This interesting form, which we do not hesitate to consider a subspecies of *S. piscatrix*, is already described in Baird, Brewer & Ridgway's *Water-Birds of North America*, II. p. 182, from an adult *female* procured by Colonel A. J. Grayson on Socorro Island in the Revilla Gigedo group.

This Gannet is named as a compliment to Mr. Frank B. Webster, of Hyde Park, Mass., U.S.A.

We consider the increased knowledge about this form to be one of the most interesting results of the expedition. These birds breed in enormous colonies. On Clarion Island, in the Revilla Gigedo group, the nests were found in the first week of July. They were all placed on bushes from 2 to 10 ft. from the ground, composed of twigs, very shallow and lined with coarse grass. In the Galapagos Island (Tower Island, last week in December) they were partly found on bushes, partly on the ground. The eggs are like those of *S. piscatrix piscatrix*.

2. **Sula variegata** (Tsch.).

Dysporus variegatus, Tschudi, *Fauna Peru., Orn.* p. 313 (1845).
Sula variegata, Grant, *Cat. B. Brit. Mus.* XXVI. p. 434.
Sula cyanops, Reichenbach, *Natatores*, Pl. XXIXc. Nos. 2289-90 (1850); Ridgway in *Proc. U.S. Nat. Mus.* XIX. p. 595.

This rare species of gannet has for a long time only been known in its spotted juvenile plumage. Grant (*l.c.*) has for the first time duly recognised and described the adult bird, but he did not emphasise the close relationship to *S. cyanops*. It is most excusable that Sundevall and Baur should have mistaken the adult *S. variegata* for *S. cyanops*. The two are—in the adult plumage—nearly alike, except that the bill is red or whitish pink, yellow towards the tip, in *S. variegata*; while it is horn-colour or yellowish, but **never reddish pink** in *S. cyanops*. The feet also are evidently darker in *S. variegata*. The tail shows generally more white on the basal portions of the middle rectrices, but this character is not constant.

S. variegata is evidently not rare on the Galapagos Islands, being found from Wenman and Culpepper to Charles, Hood, and Tower Islands.

The nests are placed in a slight hollow on the ground between the rocks or on the cliffs, and consist of a few pebbles. The eggs are two in number, but sometimes only one was found. They are like the eggs of *S. cyanops*.

They breed in colonies on Wenman, Culpepper, Hood, Gardner (near Charles), and Tower Islands.

3. **Sula nebouxi** Milne-Edw.

Sula nebouxi, Milne-Edwards in *Ann. Soc. Nat. Zool.* 52 (6), XIII. art. 4. p. 37. Pl. XIV. (1882); Ridgway in *Proc. U.S. Nat. Mus.* XIX. p. 596; Grant, *Cat. B Brit. Mus.* XXVI. p. 435.
Sula gossi, Ridgway in *Auk*, V. p. 241; Ridgway in *Proc. U.S. Nat. Mus.* XII. pp. 114, 120, 121 (1890).
Sula cyanops (non Sundevall!), Salvin in *Proc. Zool. Soc. Lond.* 1883. p. 427.

This species is frequent on the Galapagos Islands. We have it from Albemarle, Barrington, Abingdon, Hood, and Chatham, but they were observed on or near most of the other islands. Curious to say, we have among twenty-six specimens only one *female*. This, however, does not differ from the *male*.

A younger bird has the whole neck smoky brown, with paler tips to the

feathers, the chest pale brown, upper tail-coverts pale brown, otherwise like adults. This specimen, however, is probably not in the first plumage, but in a transitional one. Its eyes were found to be "brown with light ring, bill greenish blue, gular sac greenish blue, feet lead-colour and buff" (Hull).

This species was found breeding on Abingdon, Hood, and Gardner Islands. It lays one or two eggs, generally two, in hollows in the ground among the rocks. The eggs are like those of other species of *Sula*, *i.e.* very light blue, and covered with a chalky white deposit. They vary much in size and shape, measuring 66 by 45, 67 by 43, 65 by 44, 60 by 43, and 58 by 45·5 mm.

4. (?) **Sula brewsteri** Goss.

Sula brewsteri Goss in *Auk* V. p. 242 (1888); Ridgway in *Proc. U.S. Nat. Mus.* XIX. p. 597.

We have no evidence of this species occurring in the Galapagos Archipelago at all. It is possible that the specimen called *Dysporus leucogaster* (= *Sula sula*) by Sundevall (*P. Z. S.* 1871, p. 125), caught in the archipelago by Kinberg, that one caught on board the vessel near Tower Island by Habel, and which escaped afterwards, and the birds seen by Messrs. Baur & Adams on Bindloe and Cowley Islands, were *S. brewsteri* (or *S. sula brewsteri* as it might be more correctly named, in view of the similiarity of the *female* to *S. sula sula*), but it is just as possible that they were young of *S. nebouxi*.

One specimen of *S. brewsteri* was obtained by R. H. Beck on the vessel at 110° long., 11·20′ lat. N., on January 11th, 1898. A *female*. "Its feet and tarsi yellowish pea-green, bill light horn-colour with a greenish cast, gular sac pea-green, spot in front of eye dark slate, Iris dark brown with a light ring around the edge. Length 32, extent 62."

Genus PHALACROCORAX Briss.*

Phalacrocorax, Brisson, *Orn.* VI. p. 511 (1760).

Almost cosmopolitan, but apparently absent from the central portions of the Pacific Ocean.

1. **Phalacrocorax harrisi** Rothsch.

Phalacrocorax harrisi, Rothschild in *Bull. B. O. Club* VII. p. 52 (1898).
Nannopterum (gen. nov.) *harrisi*, Sharpe, *Genera and Species of Birds*, p. 235 (1899).

♂ ad. Upperside brownish black, bases of the feathers blackish grey. Neck brownish black behind, dark brown with pale brown edges to the feathers in front, silky white filaments scattered about the sides of the neck and head. Quills blackish brown with a hoary grey "bloom," paler on the outer webs and tips. Wing-coverts and scapulars dark hoary grey, with black borders. Tail-feathers fourteen—narrow, very stiff, black. Underside dark brown, tips and margins of the feathers more or less pale brown, sometimes nearly whitish. "Iris grass-green,

* We may here mention that, if the twelfth edition of Linnaeus (1766) is accepted as the starting-point of zoological nomenclature, *Carbo* Lacepède would be the generic title of this genus. Grant in *Cat. B. Brit. Mus.* XXVI. accepts *Phalacrocorax* Brisson 1760, while he rejects *Onocrotalus* Brisson 1760. Such inconsistent nomenclature can surely not be recommended.

greenish, or hazel, with a greenish tint." Gular sac at base slate-colour, below the bill nearly as light as flesh, on the lores slate-colour. Bill blackish, horn-colour towards the tip and below. Legs and feet black. Length (measured in the flesh) 36—39½ in., extent 28—32 in. Bill from end of frontal feathering to tip in a straight line 76—82, wing 175—190, tail 155—165, tarsus 65—75, outer toe about 120—125, inner toe about 45—50 mm.

This extraordinary bird, the wings of which are of about the same length as those of the great auk (*Alca impennis*), and which cannot possibly enable it to fly, was only found in the surf on the north coast of Narborough Island. Only a few specimens were procured. We do not see the necessity of separating it generically. It is named in honour of Mr. Charles Miller Harris, the able leader of the expedition.

Genus PHAËTHON L.

Phaëthon, Linnaeus, *Syst. Nat.* ed. 10. I. p. 134 (1758).

Tropical seas in general.

1. **Phaëthon aethereus** L.

Phaëthon aethereus, Linnaeus, *l.c.*; Salvin in *Trans. Zool. Soc. Lond.* IX. p. 497; Ridgway in *Proc. U.S. Nat. Mus.* XIX. p. 600; Grant, *Cat. B. Brit. Mus.* XXVI. p. 457.

Only this species of Tropic Bird is known from the Galapagos Islands. We have about half a dozen from Tower Island, from Baur & Adams, and a large series from the Webster expedition from Hood Island, as well as from Culpepper and Gardner.*

The eggs were found in holes in the rocks on Hood Island in the latter week of October.

Genus ARDEA L.

Ardea, Linnaeus, *Syst. Nat.* ed. 10, I. p. 141 (1758).

Nearly cosmopolitan.

1. **Ardea herodias** L.

Ardea herodias, Linnaeus, *Syst. Nat.* ed. 10, I. p. 143 (1758); Ridgway in *Proc. U.S. Nat. Mus.* XIX. p. 601; Sharpe, *Cat. B. Brit. Mus.* XXVI. p. 80.

We have received five *females* from Albemarle and Indefatigable, shot between August and November. They are all rather paler on the neck, upper and under wing-coverts. They are, however, quite or almost matched by some North American examples of *A. herodias* in the British Museum. It may be that these characters are of subspecific value, or that they are peculiar to the *female* (?). It would be reckless to separate the two forms at present, but we recommend their closer study with a bigger material for the future.

A nest in a large bush was found on Indefatigable Island on September 2nd. It contained three eggs, which are like those of other herons, measuring 61·5 by 46 and 64 by 47 mm.

* We received *Phaëthon rubricauda* from near the Clarion Islands, Revilla Gigedo group.

Genus HERODIAS Boie.

Herodias, Boie in *Isis*, 1882, p. 559.

Nearly cosmopolitan.

1. **Herodias egretta** (Gm.)

Ardea egretta, Gmelin, *Syst. Nat.* I. p. 629 (1788).
Herodias egretta, Sharpe, *Cat. B. Brit. Mus.* XXVI. p. 95 ; Ridgway in *Proc. U.S. Nat. Mus.* XIX. p. 601.

Dr. Baur has found on Albemarle "a rookery of a white heron (the adults fully white").

We have received a beautiful adult *male* from Albemarle Island. It does not differ from South American examples, the wing being 410 mm. long, but it seems to us that North American birds have the wing generally about 20 to 30 mm. shorter. The long-winged South American birds probably form a distinct subspecies.

Genus BUTORIDES Blyth.

Butorides, Blyth, *Cat. B. Asiat. Soc.* p. 281 (1849).

Distributed over America, Africa, and Madagascar, temperate and tropical portions of Asia to Australia. Absent from Europe.

1. **Butorides plumbeus** (Sund.).

Ardea plumbea, Sundevall in *Proc. Zool. Soc. Lond.* 1871, pp. 125, 127.
Butorides plumbeus, Salvin in *Trans. Zool. Soc. Lond.* IX. p. 497 (1876) ; Ridgway in *Proc. U.S. Nat. Mus.* XIX. p. 603.
B. sundevalli, Reichenow in *Journ. f. Orn.* 1877. p. 253 ; Sharpe, *Cat. B. Brit. Mus.* XXVI. p. 185. (There is no reason to reject the specific name *plumbea*, the *Ardea plumbea* of Merrem being a bird belonging to a totally different genus, and we do not accept the illogical rule "Once a synonym, always a synonym.")

The *Butorides* of the Galapagos Islands is easily distinguished from all the other species of the genus by its very much darker underside, darker neck without, or with only indications of rufous, but with very distinct black longitudinal patches. Further by their darker wings, which have no white edges to the inner primaries, and by the very narrow and deep rufous brown, instead of buff or rusty wide, edges to the wing-coverts. *B. plumbeus* is also stouter built and larger than its American relations.

We have received specimens from Chatham, Bindloe, Jervis, Hood, Indefatigable, Wenman, Abingdon, Albemarle, and Barrington Islands. Ridgway mentions also Duncan, Charles, and James Islands. Dr. Baur observed it on Tower Island. One specimen, killed on board ship at Barrington Island on October 7th (No. 1548), had the "Iris bright orange-red, legs redder than orange red, bare skin on lores bluish."

Genus NYCTANASSA Stejn.

Nyctherodius, Reichenbach, *Syst. Av.* 1852, p. XVI. (non *Nycterodius* Macgillivray 1842.)
Nyctanassa, Stejneger in *Proc. U.S. Nat. Mus.* X. p. 295 (1887).

Warmer portions of America.

1. **Nyctanassa violacea** (L.).

Ardea violacea Linnaeus, *Syst. Nat.* ed. 10. I. p. 143 (1758).
Nycticorax violaceus, Gould in *Zool. Voy. Beagle*, III. Birds, p. 128 (1841).
Nyctanassa violacea, Ridgway in *Proc. U.S. Nat. Mus.* XIX. p. 606.
Nycticorax pauper, Sclater & Salvin in *Proc. Zool. Soc.* 1870, pp. 323, 327 ; Salvin in *Trans. Zool. Soc.* IX. p. 498 (1876).
Nyctanassa pauper, Sharpe, *Cat. B. Brit. Mus.* XXVI. p. 134, pl. Ic. (1898).

We take it on the authority of Mr. Ridgway that the "Yellow-crowned Night Heron" of the Galapagos is not separable from the the wide-spread species. Ridgway says, "Placing together four adults from the Galapagos with one from Socorro Island, and three from Louisiana, I find it impossible to detect any differences of coloration or proportions that are not of a purely individual character."

Although we have received not less than seventeen skins from Charles, Chatham, Bindloe, Tower, Albemarle, and Hood Islands, they were all autumn birds, except two from July 6th and 14th, collected by Dr. Baur. All these are so much darker than the birds before us, shot in breeding plumage in various parts of Central America, Mexico, Florida, and the Bahamas, that we should have thought they belonged to a different form, but having no adult spring specimens, and considering the great variation of *N. violacea*, we must accept Ridgway's statement who had spring specimens in full plumage before him.

There is no doubt whatever that the original description, as well as that in the *Catalogue of Birds*, and the plate in the latter work, Vol. XXVI. are taken from a young bird. We should recommend, nevertheless, the re-examination of a greater number of adult skins in nuptial plumage from the Galapagos, as we have an idea that they do not attain such light colours as *N. violacea* from other countries.

Genus PHOENICOPTERUS L.

Phoenicopterus, Linnaeus, *Syst. Nat.* ed. 10, I. p. 139 (1758).

Tropical and subtropical regions chiefly of both hemispheres.

1. **Phoenicopterus ruber** L.

Phoenicopterus ruber, Linnaeus, *Syst. Nat.* ed. 10, I. p. 139 ; Salvin in *Trans. Zool. Soc. Lond.* IX. p. 498 ; Salvadori, *Cat. B. Brit. Mus.* XXVII. p. 11 (1895) ; Ridgway in *U.S. Nat. Mus.* XIX. p. 608.
P. glyphorhynchus, Gray in *Ibis* 1869, pp. 439, 442, pl. XIV. fig. 5.

The difference on which Gray had founded his *P. glyphorhynchus* not being characteristic for the Galapagos flamingoes, the birds from there have been united with the North American *P. ruber*, which inhabits "the coasts of the Caribbean Sea and of the Gulf of Mexico north to Southern Florida and the Bahamas." Although this distribution is peculiar, it is not unique, and we see no sufficient reasons to separate the Galapagos birds from *P. ruber*.

Ridgway (*l.c.*) says that the Galapagos flamingoes are distinctly paler in coloration and of a slightly smaller average size. It is true that we find brighter specimens among the Bahama Islands flamingoes, but we have only a very poor series to compare, while our Galapagos series is both large and beautiful. The brightest Galapagos skins are some that are greasy. Ridgway's measurements show a slightly smaller average size for Galapagos birds, but this is not sufficient to separate the latter from *P. ruber*. We have specimens from Albemarle, Charles and James Islands. Habel saw it on Indefatigable.

Genus POECILONETTA Eyt.

Poecilonetta, **Eyton**, *Monagr. Anatid.* p. 16 (1838).

South America.

1. **Poecilonetta bahamensis galapagensis** Ridgw.

Poecilonetta bahamensis, Gould in *Zool. Beagle*, III. Birds, p. 135 (not *Anas bahamensis* Linnaeus).
Dafila bahamensis, Salvin in *Trans. Zool. Soc. Lond.* IX. p. 499, and in *Proc. Zool. Soc. Lond.* 1883, p. 428.
Poecilonetta galapagensis, Ridgway in *Proc. U.S. Nat. Mus.* XII. p. 115 (1889), and in XIX. p. 612; Salvadori, *Cat. B. Brit. Mus.* XXVII. p. 284.

The little pintailed duck of the Galapagos is very closely allied to *P. bahamensis bahamensis*, and can only be ranked as a subspecies of the latter. The only distinguishing character which can be depended on is the brown speckled patch at the root of the upper jaw. It is certainly incorrect to say that the "sides of the head" are thickly speckled with brown, for there are among our unique series of forty-five skins from the Galapagos Islands several perfectly adult birds which have the sides of the head purely white, and only behind the base of the bill a light brown, dark speckled patch, while in *P. bahamensis bahamensis* the white reaches almost up to the bill, leaving only a very narrow brown speckled patch. The crown is generally a shade lighter brown, but not regularly more grey. The speckling on the breast has a somewhat different appearance, and the spots there seem to be more frequent in *P. bahamensis galapagensis*. In the *males* of the latter the chest feathers have three blackish brown spots, while in *P. bahamensis bahamensis* there seems to be always one only. The *females* have a much shorter wing than the males, and the chest feathers have, as in young *males*, one black spot near the tip.

We have this duck from Chatham, James, Indefatigable, Albemarle, and Charles Islands. It is also known to occur on Duncan, Hood, Barrington, Jervis, and Tower.

[**Querquedula versicolor** (Vieill.).

According to Sundevall Mr. Kinberg obtained a specimen somewhere in the Galapagos Archipelago. It has not been found since among the islands. (Cf. Ridgway, *l.c.* p. 614).]

Genus NESOPELIA Sundev.

Nesopelia, **Sundevall**, *Meth. av. disp. Tentam.* p. 99 (1872).

The genus *Nesopelia* is restricted to the Galapagos Islands. It is closely allied to *Zenaida*, but the tail is composed of twelve rectrices, while it is said to have fourteen in all species of *Zenaida*. The bill is rather long and arched near the tip, the feet are larger, the tail somewhat short and stiff.

1. **Nesopelia galapagoensis galapagoensis** (Gould).

Colombi-galline des Gallapagos Néboux in *Rev. Zool.* p. 290 (1840).
Zenaida galapagoensis Gould, *Zool. Voy. Beagle*, III. Birds, p. 115, Pl. XLVI. (1841); Salvin in *Trans. Zool. Soc.* IX. p. 499.
Nesopelia galapagoensis Salvadori, *Cat. B. Brit. Mus.* XXI. p. 391; Ridgway in *Proc. U.S. Nat. Mus.* XIX. p. 615.

When Ridgway wrote his *Birds of the Galapagos Islands* the following islands

were known as the home of this interesting pigeon : Albemarle, Duncan, Charles, Hood, Chatham, Indefatigable, James, Tower, Bindloe. Baur adds (*Am. Nat.* 1897, p. 784) Jervis Island. We have received it from most of these places, and in addition from Abingdon, Narborough, and Gardner Islands. Specimens from all these islands do not differ, as far as we can see, but we have received a large series from Wenman and Culpepper, and find them to differ materially in size.

Two *females* from Hood Island are semi-albinistic. Their tails are for the greater part of their length light grey, while one of them has also the primaries white with brown tips.

2. **Nesopelia galapagoensis exsul** subsp. nov.

Differs from *Nesopelia galapagoensis galapagoensis* in being larger. While the wing of the latter varies in the *male* from 130 to 140 mm., it measures in our new subspecies 142 to 148 mm. As we have measured twenty from Culpepper and three from Wenman, we cannot be mistaken. Also the *females*, of which we have only one from Culpepper and two from Wenman, have the wing longer than *females* from the southern and central islands of the group—*i.e.*, 130 to 135—while in the latter it varies between 120 and 129 mm. The tail is also about 5 to 8 mm. longer in the birds from Culpepper and Wenman Islands.

"The iris is brown, the bill black, the feet pinkish red, skin round the eye indigo-blue."

All the birds from Culpepper and Wenman Islands were collected in July.

The *females* of both forms differ from the *males* in their much smaller size, duller upper surface, and more whitish wing-coverts, while the sides of the neck are often as glossy as in the *male*. Immature birds are below brownish, with whitish fringes to the feathers, the sides of the neck are not glossy, and the lesser upper wing-coverts have rufous edges.

Mr. Harris writes : "The extreme scarcity of *Nesopelia* on Albemarle, Charles, and Chatham Islands is noticeable, as these islands are infested with wild house-cats, and these pigeons, being principally ground-birds, are easily caught by the cats."

Genus CRECISCUS Cab.

Creciscus, Cabanis in *Journ. f. Orn.* 1856, p. 428.

New World from temperate North America to Peru and Chili. If the genus *Creciscus* is separated from *Porzana* at all, then the Galapagos rails belong doubtless to *Creciscus*.

1. **Creciscus spilonotus** (Gould).

Zapornia spilonota, J. Gould in *Darwin's Voy. Beagle*, III. Birds, p. 132, Pl. XLIX. (1841).
Porzana spilonota, Salvin in *Trans. Zool. Soc. Lond.* IX. p. 500 (not v. X.) (partim !) ; Ridgway in *Proc. U.S. Nat. Mus.* XIX. p. 618 (partim ?).
Porzana galapagoensis, Sharpe, *Cat. B. Brit. Mus.* XXIII. p. 113 ; Ridgway in *Proc. U.S. Nat. Mus.* XIX. p. 619.

Dr. Sharpe was the first author who recognised that there were two forms of rails in the Galapagos Islands, one, a larger and more powerful one, discovered by the collectors of the "*Beagle*," and apparently not found since, on James Island,* the

* Darwin, *Journal of Researches into the Nat. Hist. and Geol. of countr. vis. dur. voy. round the World*, p. 402 (ed. 1890) : "So damp was the ground that there were large beds of a coarse cyperus, in which great numbers of a very small water-rail lived and bred."

other, a smaller bird and generally, though not always, more spotted, was discovered by Habel on Indefatigable Island, but united with *C. spilonotus* by Salvin. Dr. Sharpe at once saw that they were different species, but somehow he referred the name of *Zapornia spilonota* to the form from Indefatigable Island, although Darwin had never landed on the latter isle, and specially mentions that he got the rails on James Island. Apart from the evidence of locality, the figure of this rail in the *Voyage of the Beagle*, III. (Birds) and the original description are evidently, in our opinion, those of the large, dark form from James Island. Dr. Sharpe believes that the type of *Zapornia spilonota* is lost, but we see no reason for doubt that the skins now in the British Museum are actually the types, since there are no others of which we know, and since Gould was not always careful to mark the specimen from which he made the original description as the "type." We have no doubt at all that the name "*spilonota*" belongs to the rail from James Island, and that therefore "*Porzana galapagoensis*" Sharpe is a synonym of the latter. We cannot, either, agree with Dr. Sharpe that this form belongs to another genus than the rail from Indefatigable. The sole difference between the two Galapageian rails is that the one from James Island is a little larger, with stronger beak and legs, slightly deeper brown back, and unspotted or very slightly spotted wing-coverts, while the rail from Indefatigable is a little smaller, with smaller bill and legs, lighter brown back, and generally more frequently spotted wing-coverts, flanks, and lower abdomen, while the back and rump is also mostly dotted with white. The amount of the white spotting varies very much, being less and almost quite absent in some individuals.

We have not received *Creciscus spilonotus*, which is only, as far as we are aware, represented in the British Museum at present.

2. **Creciscus sharpei** sp. nov.

Porzana spilonota (not *Zapornia spilonota* Gould!), Sclater and Salvin in *Proc. Zool. Soc. Lond.* (1868) p. 456, (1870) p. 323; Salvin in *Trans. Zool. Soc. Lond.* IX. p. 500 (partim!).
Creciscus spilonotus, Sharpe, *Cat. Brit. Mus.* XXIII. p. 137 (1894).
Porzana spilonota (partim!), Ridgway in *Proc. U.S. Nat. Mus.* XIX. p. 618.

Indefatigable Island (Habel and Harris' expedition).

♂ ad. Head, nape, and underside as far as the abdomen slate-colour. Rest of upperside chocolate-brown, lighter and more brownish on the upper back and neck, darkest on the rump and upper tail-coverts, which are almost blackish. Wing-coverts nearly always, back, rump and upper tail-coverts in some individuals frequently spotted with white, inner secondaries mostly spotted with white. Lower abdomen and flanks brownish slate-colour, more or less spotted or barred with white, under tail-coverts spotted with white. Iris red, bill blackish, feet dark brown. Total length (in the flesh) 146 to 154 mm., wing 67 to 69, bill from end of frontal plumes 15·5 to 16·6, middle toe and claw 27 to 29, tarsus about 21.

♀ ad. Differs from the *male* in having the chin and upper throat lighter, almost whitish grey, in being a shade lighter slaty grey below, in being, perhaps, less spotted with white, on the whole, and generally a little smaller. Total length (in the flesh) 137 to 145 mm., wing 65 to 67.

We have received four *males* and four *females*, evidently all adult individuals, shot in September and October 1897.

Creciscus sharpei is hardly more than a subspecies of *C. spilonotus*. If the genus *Creciscus* is separated from *Porzana*, then there is no doubt that the Galapageian forms belong to *Creciscus*, as a comparison will show at a glance.

Genus GALLINULA Briss.

Gallinula, Brisson, *Orn.* VI. p. 3 (1760).

Nearly cosmopolitan.

1. **Gallinula galeata** (Licht.).

Crex galeata, Lichtenstein, *Verz. Doubl.* p. 80 (1823).
Gallinula galeata, Sharpe, *Cat. B. Brit. Mus.* XXIII. p. 177 (1894) ; Ridgway in *Proc. U.S. Nat. Mus.* XIX. p. 621.

Dr. Baur obtained three specimens on Albemarle Island, and we have received a single *male* from the same island. This specimen does not show the differences from continental examples seen in those shot by Dr. Baur. The frontal shield is not narrower, but on the contrary very broad, the coloration as dark as in true *G. galeata*.

On the label we find the following remarks : "Albemarle, Nov. 10, 1897 (R. H. Beck). Length 14·50, extent 23·50 in. Bill and frontal plate red, nearly or quite vermilion, tip to 0·30 of an inch greenish yellow. Tarsi lemon yellow, with a greenish cast behind. Toes olive green. Tibia with vermilion circle at below the feathers, remainder yellowish green."

Genus HAEMATOPUS L.

Haematopus, Linnaeus, *Syst. Nat.* ed. 10, I. p. 152 (1758).

Nearly cosmopolitan.

1. **Haematopus galapagensis** Ridgw.

Haematopus palliatus (non Temm.) Salvin in *Trans. Zool. Soc. Lond.* IX. p. 502 (1875).
H. galapagensis, Ridgway in *Auk* III. p. 331 (1886) ; Ridgway in *Proc. U.S. Nat. Mus.* XIX. p. 621 ; Sharpe, *Cat. B. Brit. Mus.* XXIV. p. 116.
H. leucopus galapagensis, Seebohm, *Geogr. Distr. Charadriidae*, p. 307 (1888).

The oyster-catcher of the Galapagos group resembles the American *H. palliatus*, but differs in being deeper blackish above, in having more black on the tail and secondaries, as well as on the inner primaries and tail-coverts.

We have received skins from Albemarle, Hood, Bindloe, James, Indefatigable, Tower and Chatham Islands.

The bill varies considerably in length in both sexes.

Genus AEGIALITIS Boie.

Aegialitis, Boie in *Isis*, 1822. p. 558.

Almost cosmopolitan.

1. **Aegialitis semipalmata** Bp.

Charadrius semipalmatus, Bonaparte in *Journ. Acad. Nat. Sci. Philadelphia*, V. p. 98 (1825).
Aegialeus semipalmatus, Sharpe, *Cat. B. Brit. Mus.* XXIV. p. 250.
Aegialeus semipalmatus, Ridgway in *Proc. U.S. Nat. Mus.* XIX. p. 628.

We cannot recognise the genus *Aegialeus*, which is said to differ from *Aegialitis* by a web connecting the outer and middle toes, because this web is also present, only smaller in the genus *Aegialitis* as restricted by Dr. Sharpe.

A. semipalmata is before us from Chatham, Charles, Albemarle, Jervis and Indefatigable Islands. The specimens have been obtained from July 29th to December 3rd.

Genus CALIDRIS Cuv.

Calidris, Cuvier, *Leç. Anat. Comp.* I. Pl. II. (1800).

Restricted to the Arctic regions during breeding period, but visiting the shores of the whole world in winter.

1. **Calidris arenaria** (L.).

Tringa arenaria, Linnaeus, *Syst. Nat.* ed. 12, I. p. 251 (1766).
Calidris arenaria, Ridgway in *Proc. U.S. Nat. Mus.* XIX. p. 629.

Albemarle, Chatham, Hood, Abingdon, Jervis and Bindloe Islands. Found on Albemarle as early as July 29th.

Genus ARENARIA Briss.

Arenaria, Brisson, *Orn.* V. p. 132 (1760).
Strepsilas auct. mult.

Breeding in northern portions of Northern Hemisphere only, sea-coasts of the whole world to the sub-Antarctic regions during migration period.

1. **Arenaria interpres** (L.).

Tringa interpres, Linnaeus, *Syst. Nat.* ed. 10, I. p. 148 (1758).
Arenaria interpres, Ridgway in *Proc. U S. Nat. Mus.* XIX. p. 625.

Not rare on the sea-shores almost throughout the whole year. Dr. Baur obtained specimens on Charles Island as early as June 30th, and on Albemarle on July 30th. They were in worn breeding plumage. It is known that turnstones are sometimes seen on the coasts of tropical islands during their breeding time, but there is every sign that they do **not** breed there. Harris' party obtained specimens from September to November on Culpepper, Chatham, Charles, Indefatigable and Jervis Islands.

Genus SQUATAROLA Leach.

Squatarola, Leach, *Syst. Cat. Mamm. & Birds Brit. Mus.* p. 29 (1816).

Breeding in the tundras of the northernmost portions of the Northern Hemisphere, cosmopolitan during migration.

1. **Squatarola squatarola** (L.)

Tringa squatarola, Linnaeus, *Syst. Nat.* ed. 10, I. p. 149.
Squatarola squatarola, Ridgway in *Proc. U.S. Nat. Mus.* XIX. p. 626.

Obtained by Messrs. Baur & Adams on Albemarle Island in August; by Beck on Charles Island in November.

Genus HETEROPYGIA Coues.

Heteropygia, Coues in *Proc. Philad. Acad.* 1861, p. 161.

If the genus *Heteropygia* is separable from *Tringa*, which seems very doubtful, its distribution would be Siberia and North America ; in winter south to Chili and Australia.

1. **Heteropygia bairdi** (Coues).

Actodromas bairdii, Coues in *Proc. Philad. Acad.* 1861, p. 194.
Heteropygia bairdi, Sharpe, *Cat. B. Brit. Mus.* XXIV. p. 570.

One *male*, Barrington Island, October 6th, 1897.

Genus TRINGA L.

Tringa, Linnaeus, *Syst. Nat.* ed. 10, I. p. 148 (1758).

Cosmopolitan during migration.

1. **Tringa minutilla** Vieill.

Tringa minutilla, Vieillot in *Nouv. Dict.* XXXIX. p. 452 (1819) ; Ridgway in *Proc. U.S. Nat. Mus.* XIX. p. 631.

Indefatigable (Habel), Charles Island (Beck), Barrington Island (Beck).

Genus HETERACTITIS Stejn.

Heteractitis, Stejneger in *Auk* I. p. 236 (1884).

1. **Heteractitis incanus** (Gm.).

Scolopax incana, Gmelin, *Syst. Nat.* I. p. 658 (1788).
Heteractitis incanus, Ridgway in *Proc. U.S. Nat. Mus.* XIX. p. 632.

We have it from Culpepper, Chatham, Charles, Abingdon, Albemarle and Indefatigable Islands. Townsend obtained it also on James and Hood Islands.

Genus HELODROMAS Kaup.

Helodromas, Kaup, *Naturl. Syst.* p. 144 (1829).

Nearly cosmopolitan during migration.

Not being at leisure at present to discuss the somewhat difficult question of the genera of the *Totaninae*, we accept the genus *Helodromas* of the *Catalogue of Birds*, but we are afraid it will have to be joined to *Rhyacophilus*, if not to *Totanus*.

1. **Helodromas solitarius** (Wils.).

Tringa solitaria, Wilson, *Amer. Orn.* VII. p. 53. Pl. LVIII. f. 3 (1813).
Helodromas solitarius, Sharpe, *Cat. B. Brit. Mus.* XXIV. p. 444.

Two specimens were procured on Chatham Island on October 12th. The species has not yet been recorded from the Galapagos Islands.

Genus NUMENIUS Briss.

Numenius Brisson, *Orn.* VI. p. 311 (1760).

Cosmopolitan during migration; Arctic and temperate regions of Northern Hemisphere during breeding time.

Numenius hudsonicus Lath.

Numenius hudsonicus, Latham, *Ind. Orn.* II. p. 712 (1790); Salvin in *Trans. Zool. Soc. Lond.* IX. p. 504; Ridgway in *Proc. U.S. Nat. Mus.* XIX. p. 633; Sharpe, *Cat. B. Brit. Mus.* XXIV. p. 364.
Numenius borealis, Salvin in *Proc. Zool. Soc.* 1883, p. 429.

This bird breeds in the Arctic and sub-Arctic regions of North America; in winter over the greater portions of South America. We have specimens from Charles, Chatham, Albemarle and Indefatigable Islands.

Salvin (*l.c.*) mentions also a specimen of *N. borealis*, as being shot on Charles Island by Captain A. H. Markham. This was evidently done by a pen-slip, for the specimen is *N. hudsonicus*. (Cf. Sharpe, *Cat. B. Brit. Mus.* Vol. XXIV. p. 367, specimen *b*[1].)

Genus HIMANTOPUS Briss.

Himantopus, Brisson, *Orn.* VI. p. 33 (1760).

Hot and temperate regions round the world.

1. **Himantopus mexicanus** (P. L. S. Müll.)

Charadrius mexicanus, P. L. S. Müller, *Syst. Nat. Anhang*, p. 117 (1776).
Himantopus mexicanus, Ridgway in *Proc. U.S. Nat. Mus.* XIX. p. 633; Sharpe, *Cat. B. Brit. Mus.* XXIV. p. 320.
H. nigricollis, Salvin in *Trans. Zool. Soc. Lond.* IX. p. 502.

We do not notice any differences between our Galapagos skins and those from other parts of America. We have specimens from Indefatigable, Albemarle, and Chatham Islands; Ridgway mentions also James Island. This species inhabits temperate North America, southward to Brazil and La Plata.

Genus LARUS L.

Larus, Linnaeus, *Syst. Nat.* ed. 10, I. p. 136 (1758).

Cosmopolitan.

1. **Larus fuliginosus** Gould.

Larus fuliginosus, Gould in *Voy. Beagle*, III. Birds, p. 141 (1841); Salvin in *Trans. Zool. Soc.* IX. p. 505, Pl. LXXXVII; Saunders, *Cat. B. Brit. Mus.* XXV. p. 222; Ridgway in *Proc. U.S. Nat. Mus.* XIX. p. 635.

This dark-coloured gull is apparently confined to the Galapagos group. It is now known to inhabit Abingdon, Bindloe, James, Indefatigable, Barrington, Chatham, Charles, Albemarle, Jervis, Tower, and Hood Islands. One fresh egg was picked up on November 10th on Albemarle Island. It is very pale dirty greenish, with liver-brown spots and patches, and underlying purplish mauve spots, and measures 61 by 43 mm.

Genus XEMA Leach.

Xema, Leach in *Ross's Voyage Baffin's Bay*, App. II. p. LVII. tab. (1819).
Creagrus, Bonaparte in *Naumannia*, 1854, p. 213.
Chema, Reichenow in *Journ. f. Orn.* 1889, p. 188.

In placing the large Galapagos gull in the genus *Xema*, we are following the *Catalogue of Birds* (Vol. XXV.), not being at present in a position to discuss the genera of the *Laridae*, but it is with some reluctance that we unite *Xema* and *Creagrus* into one genus. The differences between the two forms, on the other hand, are not so important as Ridgway makes them out to be. The beak is more curved in *Creagrus*, somewhat higher near the base, and the tarsus is of the same length as the middle claw, while in *Xema sabinei* the tarsus is much longer than the foot. This latter character is the only one that might be considered to be of generic importance, but if this principle is adopted, then several more divisions will have to be accepted than Mr. Saunders admitted in the *Catalogue of Birds*, Vol. XXV. (cf. p. 161, where the following genera are adopted: *Xema*, *Rhodostethia*, *Larus*, *Gabianus*, *Leucophaeus*, *Pagophila*, and *Rissa*).

1. **Xema furcata** (Néboux).

Mouette à queue fourchue, Néboux in *Rév. Zool.* 1840, p. 290.
Larus furcatus, *l.c.* ; *Voy. Vénus*, Atlas Pl. X. (1846).
Creagrus furcatus, Salvin in *Trans. Zool. Soc.* IX. p. 506.
Xema furcatum, Saunders in *Proc. Zool. Soc.* 1882, p. 523, pl. 34.
Xema furcata, Saunders, *Cat. B. Brit. Mus.* XXV. p. 165.
Creagrus furcatus, Ridgway in *Proc. U.S. Nat. Mus.* XIX. p. 638.

This beautiful gull is evidently very common at the Galapagos Islands, where it may be seen near most of the islands, from Culpepper to Hood, but it finds suitable nesting-places on a few of the islands only. It is also known to occur off the coast of Peru and at Malpelo Island, but the original locality "Monterey, California," cannot be accepted, as Monsieur Néboux, who brought the specimen home, came from the Galapagos Archipelago! Ridgway and Saunders gave the most accurate and most detailed descriptions of this gull.

Numbers were found breeding in July on Wenman and Culpepper, in October on Tower, and in December on Hood Island. The number of eggs was only one in every case. The nest consisted of pebbles, or pebbles and pieces of bones, placed among the rocks on the cliffs, but some were also found without any indication of a nest on the bare ground among the rocks. The eggs resemble those of other gulls, and vary in the same way. They are more or less regularly ovate (Ridgw. pl. XVI. fig. 1). Most specimens are very light greenish or bluish white with large and bold spots and patches of a very dark brown, and with underlying greyish-mauve spots. The spots are either spread all over the egg, or accumulated near the thick end, and sometimes form a loose ring near the thick end. Hair-like lines are not often seen. Some of the eggs are of a light reddish or brownish fleshy ground-colour, but all are light sea-green if held against the light. They measure 64 by 47·5, 66 by 46·5, 66 by 46, 64 by 45, 60 by 44·5 mm., and so on.

Genus STERNA L.

Sterna, Linnaeus, *Syst. Nat.* I. p. 137 (1758).

Cosmopolitan.

1. **Sterna fuliginosa** Gm.

Sterna fuliginosa, Gmelin, *Syst. Nat.* I. p. 605 (1788).

Not yet recorded from the Galapagos Islands, and found on Culpepper and Wenman Islands only.

With every desire to distinguish them from *S. fuliginosa fuliginosa*, we are not able to find satisfactory characters for separation.

The Galapagos specimens seemed smaller, the wings reaching from 275 to 296 mm. generally, but one *male* from Wenmán Island has them fully 310 mm. long. This latter measurement is a large average measurement for *S. fuliginosa* from other islands, which have the wings from 292 to 315 mm. long, the largest being mostly those from the islands round New Zealand. The lateral greatly elongated rectrices are only fully developed in one of our Galapagos specimens, but then they are moulting in many of the others. The outer web of these "streamers" is generally darker in the Galapagos birds, but in some it is as light as in examples from other regions, while it varies equally in the latter. The loral black streak is narrower in many of the Galapageian birds, but it is quite variable and perfectly matched by some from other countries.

Sterna fuliginosa, together with *S. anaetheta* and *S. lunata*, forms a very natural group of terns by its aberrant coloration and certain habits, laying, for example, only one egg at a time. Should a generic separation be found to be possible, the name of the genus would be *Onychoprion* Wagler, 1832, but Saunders, "with every desire to separate them generically, was unable to find any structural differences which would warrant such a proceeding."

Genus ANOUS Steph.

Anous, Stephens in Shaw's *Gen. Zool.* XIII. p. 139 (1826).

Tropical and juxta-tropical seas in general.

1. **Anous stolidus galapagensis** Sharpe.

Megalopterus stolidus, Gould in Darwin's *Voy. Beagle*, III. Birds, p. 146 (1841).
Anous stolidus, Sundevall in *Proc. Zool. Soc. Lond.* 1871, p. 125 ; Salvin in *Trans. Zool. Soc. Lond.* IX. p. 504 (1876) ; Ridgway in *Proc. U.S. Nat. Mus.* XII. p. 116 (1889).
Anous galapagensis, Sharpe in *Philos. Trans.* CLXVIII. p. 469 (1879) ; Saunders, *Cat. B. Brit. Mus.* XXV. p. 143 (1896) ; Ridgway in *Proc. U.S. Nat. Mus.* XIX. p. 642.

The noddy inhabiting the Galapagos Archipelago was formerly united with *A. stolidus stolidus* by Gould, Sundevall, Salvin ; and even Ridgway (*l.c.*) mistook an adult bird for the common wide-spread species. In 1879 Sharpe separated it as *A. galapagensis*, but the characters assigned to it are those of the young birds only, while the adult Galapagos form is very similar to adult *A. stolidus stolidus*. They are by no means so distinct as Ridgway believes them to be (*l.c.*). We have specimens from several places, but especially from the Carolines and Pelew Islands, which are hardly separable from *galapagensis*. The only differences we can appreciate are the following :—

In *A. stolidus galapagensis* the grey of the crown does not reach so far down towards the neck, and, while hardly darker in freshly moulted birds, never becomes so pale as we find it frequently in *A. stolidus stolidus*. The entire plumage, while often not a shade darker than in *A. stolidus stolidus*, never becomes so pale-brown

as in the latter. The young bird of *galapagensis* has the whitish streak above the lores not distinctly marked.

Under these circumstances this tern must be recognised as a subspecies of *A. stolidus*. It is spread all over the archipelago, from Culpepper and Wenman to Charles and Hood Islands. It is somewhat peculiar that dark-crowned birds, in the plumage of the immature ones, are found also during the breeding season.

A large breeding-place was found on July 27th and July 29th on Culpepper Island. This tern has always one egg only, placed in a small nest composed of a few small sticks among the rocks. The eggs resemble those of other species of *Anous*. They are mostly very beautifully marked, and vary very much. The ground-colour is a dead white, if held up against the light and looked through the hole it is a light greenish yellow. A few eggs have a warm fleshy tinge. The markings are paler or darker reddish brown, or deep brown patches on the thick end, or small roundish spots of the same colour, and all have more or less visible pale mauve underlying spots. They measure 51·5 by 35·5, 50 by 36, 49·5 by 35, 45 by 34·3 mm., and so on.

Genus STERCORARIUS Briss.

Stercorarius, **Brisson**, *Orn.* VI. pp. 149, 150 (1760).

Breeding in Arctic and sub-Arctic regions, wandering south in winter, reaching occasionally Peru and New Zealand.

1. **Stercorarius pomarinus** (Temm.).

Lestris pomarina, **Temminck**, *Man. d'Orn.* p. 514 (1815).
Stercorarius pomatorhinus, **Saunders**, *Cat. B. Brit. Mus.* XXV. p. 322 (1896).

One *female* was shot by R. H. Beck off North Albemarle on December 15th, 1897. It is evidently not mature. The upper parts are sooty brown, the feathers of the back and the scapulars have brownish buff tips. Foreneck and jugulum deep sooty brown with narrow whitish tips to the feathers. Remainder of underside is white, here and there sparsely speckled with deep brown. Tail feathers deep brown, not barred, under and upper tail-coverts barred blackish brown and white. Wing 360 mm.

Genus DIOMEDEA L.

Diomedea, **Linnaeus**, *Syst. Nat.* ed. 10, I. p. 132 (1758).

Principally the Southern Ocean, but ranging as far north as the Hawaiian Islands and Japan in the Pacific, and, exceptionally, as far north as the British Islands in the Atlantic Ocean.

1. **Diomedea irrorata** Salv.

Diomedea exulans, **Wolf**, *Ein Besuch auf den Galapagos Inseln*, p. 13 (1879).
Two kinds of Albatrosses, **Habel** in *Trans. Zool. Soc. Lond.* IX. p. 458 (? partim).
? Diom. exulans **and** *nigripes*, **Ridgway** in *Proc. U.S. Nat. Mus.* XIX. p. 646.
Diom. irrorata, **Rothschild** in *Bull. B. O. Club*, VII. p. 51 (1898).
D. irrorata, **Salvin** in *P. Z. S.* 1883, p. 430, and in *Cat. B. Brit. Mus.* XXV. p. 445 Pl. VIII.

Habel was the first to call attention to the fact of albatrosses occurring in the Galapagos Archipelago. In 1876 (cf. *Trans. Zool. Soc. Lond.* Vol. IX. p. 458) we learn that there are on Hood Island "two kinds of albatrosses; one had a dark blackish breast and a white band crossing the head from one eye to the other; the

breast of the other was grey, and the head black. Whether they were the sexes of one species, or two distinct ones, I am unable to decide."

In 1879 Wolf writes (translated, cf. Ridgway) ; " I would mention as a curious zoological fact that the albatross of Hood Island, and only on that island, occurs in such abundance, that the entire camp of Orchilla collectors (more than sixty men) lived for a month chiefly upon its eggs, although each *female* lays but one egg. It is evidently the widespread albatross from the Cape of Good Hope (*D. exulans*), which is also very abundant about Cape Horn."

Harris' party was specially instructed to look out for the albatrosses, and they found a large breeding colony on Hood Island, and many forsaken eggs in the latter week of October. It is somewhat strange that so large a bird with such a power of flight has never been got elsewhere in the archipelago, although the type was taken off the Peruvian coast. It seems to breed only on Hood Island. All the specimens received from there are *D. irrorata*, Salv. We do not think that two species are likely to breed on the Galapagos Islands. Dr. Habel's descriptions may possibly or partly refer to young birds, for neither of them describes the adult *D. irrorata*. Mr. Ridgway suggests that the one with the "dark blackish breast and a white band crossing the head" might have been *D. nigripes* Aud., but the home of that species is so far away from the Galapagos Islands, that we think it is more probable that the bird described by Habel and a black bird with white head seen by the Harris party on Indefatigable, are either the *D. irrorata* in its unknown juvenile plumage, or an unknown species. Young individuals in the first plumage were seen, but unfortunately not collected. Undetermined albatrosses were also observed near Duncan and Albemarle.

This species in breeding plumage agrees in general with Salvin's description. The neck is white, the forehead also white; but the crown, from between the eyes, and the hind neck, are strongly washed with buffy yellow, not only "slightly tinged." The back and wings are deep sooty brown, almost black, the primaries paler towards the base of the inner webs, the shafts of all of them light straw-yellow. The dark grey and white mottling is much coarser on the vent and under tail-coverts, in sharp contrast to the almost uniform dark grey lower abdomen and flanks. It is gradually lost on the foreneck. "The iris is brown, the bill yellow, the tarsi and feet lead-colour, lead-blue, or greenish lead-colour." The total length (as taken in the flesh by the collectors) is about 36—40 in., extent 93—99 in. The bill, measured in a straight line from base to tip, along the mandible, is 126—140 mm. long, the tarsus 85—100, wing 535—560 mm. The *female* is like the *male*, and not much smaller. The plate in *Cat. B. Brit. Mus.* gives a very wrong idea, being too brown above, and the bill and feet being coloured with a fleshy pink tint, although on p. 445 the bill is described as yellowish, the feet as dark.

The albatross was so plentiful on Hood Island that the collectors computed their number at several thousands. Antea, p. 125, in the diary, some notes on the habits of this bird are given. The eggs vary in shape from elliptical ovate to elliptical oval and even to perfectly oval (see Ridgway's Nomencl. Col. Pl. XVI.). They are of a dead white colour and entirely without gloss, and of the same structure as other albatrosses' eggs. The majority are without spots, but some show more or less small underlying patches of a pale mauve colour, generally confined to the thick end, but in one of our thirty-one specimens spread all over the surface. They measure 117·5 by 70, 107 by 64·5, 112 by 69, 96·5 by 72, 103·5 by 72, 105 by 66, 106 by 66 mm., and so on.

The eggs seemed to be dropped at random between the rocks and bushes, and each "clutch" consisted of one single egg only, but all that were found were addled.

It is remarkable that Dr. Baur, who stayed on Hood Island from July 5th to 8th, did not come across any albatrosses, nor does he mention having seen any at all.

Genus PUFFINUS Briss.

Puffinus Brisson, *Orn.* VI. p. 131 (1760).

Generally distributed over the seas of the world.

1. **Puffinus obscurus subalaris** Ridgw. (ex Townsend MS.).

Puffinus tenebrosus? (non Pelzeln), Townsend in *Proc. U.S. Nat. Mus.* XIII. p. 142 (1890), and in *Bull. Mus. Comp. Zool.* XXVII. p. 126 (1895).

Puffinus obscurus, Salvin in *Proc. Zool. Soc. Lond.* p. 431 (1883); Salvin in *Cat. B. Brit. Mus.* XXV. p. 882 (partim).

Puffinus subalaris, Ridgway (ex Townsend's MS.) in *Proc. U.S. Nat. Mus.* XIX. p. 650.

In determining the shearwater of the Galapagos Islands, we were obliged to study the entire group of little shearwaters, to which this form belongs; and we have come to the result, that they were not fully understood by Salvin, when he wrote the "Puffinidae" in Vol. XXV. of the *Catalogue of Birds*. They are a difficult group, and material from many places is wanted, but we believe that it may be possible for the present to distinguish the following forms.

a. **Puffinus obscurus obscurus** (Gm.).

Dusky Petrel, Latham, *Gen. Syn.* III. p. 416 (1785) (Christmas Island in the Pacific Ocean).

Procellaria obscura, Gmelin, *Syst. Nat.* I. p. 559 (1788) (ex Latham).

Puffinus obscurus, Salvin, *Cat. B. Brit. Mus.* XXV. p. 382 (partim, specimens *d* to *m* only, *n l*).

Puffinus dichrous, Hartlaub & Finsch in *Proc. Zool. Soc. Lond.* 1872 p. 108 (Pelew Islands).

Puffinus opisthomelas var. minor, Hartlaub in *Proc. Zool. Soc.* 1867 p. 382, H. & F. in t.c. 1868, pp. 9 and 371, Finsch in *J. F. O.* 1870, p. 371.

P. tenebrosus Pelzeln (ex Natterer) in *Ibis* p. 47 (1873). Cf. Finsch in *Journ. Mus. God.* VIII. p. 45 (1875).

This is the Pacific form, inhabiting the central portions of the Pacific Ocean, the Fanning group (Christmas Island), Pelew Islands, Carolines (a series from Ruk in the Tring Museum), probably down to the New Hebrides and Samoa.

This form is distinctly **brownish** slate above, not in the least bluish. The brownish slaty colour reaches to the base of the bill, covering the lores and running from there along the sides of the head under the eye, to the ear-coverts, but being slightly mottled with whitish under the eyes, on the ear-coverts and sides of the neck. This colour also encroaches on the sides of the chest, where it forms a distinct patch. The primaries are dusky black, the inner webs, except near the shaft, deep smoky brown, but not in the least whitish. Axillaries white. Under wing-coverts white, except a very marked blackish line round the outer margin. Under tail-coverts blackish smoky-brown, the shorter central bunch white, the next ones varied, nearly all the longer ones with narrow white tips.

There can be no doubt that *P. tenebrosus* Pelz. is the same as our *P. obscurus*. (See also Finsch, *l.c.*)

b. **Puffinus obscurus auduboni** Finsch.

Puffinus obscurus auduboni Finsch. in *Proc. Zool. Soc. Lond.* p. 3 (1872) ; Baird, Brewer & Ridgway, *Water Birds N. America*, II. p. 386 (1884) ; Ridgway in *Proc. U.S. Nat. Mus.* XIX. p. 651.
Puffinus obscurus auctorum multorum, partim ; *Cat. B. Brit. Mus.* XXV. p. 382, partim.

P. auduboni is the form found along the east coast of the United States of North America, from New Jersey to Florida, and nesting on the Bahamas, as also probably among the West Indian Islands and on the Bermudas.

This form is most closely allied to *P. obscurus*, being **brownish** slate-black above, having white axillaries (sometimes the longest with tiny dusky tips), white under wing-coverts with even a less distinctly blackish margin round the edges. While in *P. obscurus* the whole loral region behind the upper jaw is dark, the lower part of the lores is here white, there is less blackish under the eyes, the region behind the eye is lighter, being rather white, mottled with dusky, instead of dusky black mottled with whitish. The bill in *P. auduboni* is slightly longer and stronger, the wing generally distinctly longer, the whole bird a little larger, the patch on the sides of the chest lighter dusky brown.

Under tail-coverts as in *P. obscurus* or with more white. Fig. 2 in *Ibis*, 1873, p. 50 (there called *P. obscurus*) represents the shape of the bill of *P. auduboni*, while fig. 1 on the same page (there called *P. tenebrosus*) shows that of the true *P. obscurus*. The figure in Baird, Brewer & Ridgway's *Water Birds*, Vol. II. p. 387, has the amount of white rather a little exaggerated, judging from the material at our disposal. More details about the distribution of this form would be welcome.

c. **Puffinus obscurus subalaris** Ridgw. (ex Townsend MS.).

(Synonymy see above.)

The Galapagos birds seem to us to be nearest allied to the form of the central Pacific, from which they differ in the following points.

There is distinctly more dusky on the flanks, which are evidently always pure white in *P. obscurus*. The under wing-coverts agree with those of *P. auduboni* in having no distinct broad dusky line round the outer margin, but they are more or less clouded with dusky. In most specimens of our large series this latter character is very conspicuous, but in a few the dusky tinge is almost obsolete. The axillaries, which are apparently always white in *P. obscurus*, are generally more or less clouded with dusky, seldom quite white. In some specimens the whole of the under wing-coverts and axillaries are dark dusky brown. The under tail-coverts are generally wholly dark, but sometimes approach those of *P. obscurus* in the amount of whitish near the belly. The lores are dark, only white on their lower portion, the ear-coverts dusky, not mottled with whitish, but bordered with white on their lower margin, the line between the white and the brownish slate-colour being generally more sharply defined than in *P. obscurus*, and very distinctly more marked than in *P. auduboni*.

The dusky colour does not at all encroach upon the sides of the chest, which are purely white.

The most obvious differences between *P. subalaris* and *P. auduboni* are the dusky clouding on the flanks, under wing-coverts and axillaries, and the more purely dark under tail-coverts, which have always less white than in *P. auduboni*.

We have received *P. subalaris* from Culpepper, Wenman, Albemarle, Narborough, Jervis and Kicker Rock, near Chatham Island. The " bill is black above, bluish slate

below, feet bluish white, the outer toe black, tarsi bluish white, blackish along the back and on the lower portion of the outside. Iris light blue."

During the last days of July a great many eggs were found on Culpepper Island in holes under rocks, among sea-weeds. The number of eggs is only one. They are pure white, without gloss but smooth; if held against the light they look either almost pure white or light green. They measure 54 by 35, 53·5 by 35, 47 by 34·5 mm., and so on.

d. Puffinus obscurus bailloni Bp.

Puffinus bailloni, Bonaparte in *Compt. Rend. Ac. Sc.* XLI. p. 8, tabl. XI. Longip. p. 23, sp. 80 (1856); id. *Consp. Av.* II. p. 205 (1857).
Puffinus obscurus of many authors from the Atlantic Ocean, Madagascar, Mauritius, Réunion.
Nectris gama (non Bonaparte), Hartlaub, *Madagascar*, p. 84 (exclus. Synon.).
Puffinus assimilis (non Gould !), Salvin, *Cat. B. Brit. Mus.* XXV. p. 384 (partim : specimens *a* to *w*).
(?) *Puffinus elegans*, Giglioli & Salvadori in *Ibis*, 1869, p. 68 ; Salvin, *Cat. B. Brit. Mus.* XXV. p. 385 (literature) ; id. in Rowley's *Orn. Misc.* I. p. 256, Pl. XXXIV.

This form seems to be found round the coasts of Africa, from Madeira (Desertas, Porto Santo), the Canary Islands, the Cape Verd Islands, round the Cape of Good Hope to Madagascar, the Seychelles, Mauritius, etc. If the former should be found to be separable, they would require a new name. We cannot, however, with the meagre material available, discover any differences constant enough for the separation of the Atlantic form from that of the Seychelles (etc.).

P. bailloni is most poorly diagnosed, but in the words "nigro-plumbeus" (sc. *supra*) used by Bonaparte for his *P. nugax* (ex Australia) and "nigricans" (sc. *supra*) for his *P. bailloni* (ex Insula Franciae), together with the locality, sufficient reason may be found to accept *bailloni* rather than create a name for the bird under consideration.

P. elegans, shot at lat. 43° 54′ S., long. 9° 20′ E., may be the young of *P. bailloni*.

We have still to ask "Quid *Procellaria munda* Kuhl?" as Bonaparte did in 1857, Giglioli & Salvadori in 1869. In Vol. XXV. of the *Catalogue of Birds*, where one would have expected an explanation, we do not find this name even mentioned, nor one or two other hitherto unidentified *Procellariidae*.

P. bailloni differs very little from *P. obscurus* and our forms *a*, *b*, *c*. There is, however, generally a distinctly pronounced bluish tint above, more slaty, not so brown as in *a*, *b*, *c*, but the birds are mostly not quite so bluish as *P. assimilis*. The sides of the head are not sharply separated in black and white, as in *P. subalaris*, but more or less mottled, the demarcation line between the two colours being not very well defined. Sides of chest with dusky patch, as in forms *a* and *b*. Under tail-coverts variable, sometimes almost or pure white, sometimes with as much dusky black as in forms *a* and *b*. The bill is slightly shorter than in *P. obscurus*. The inner webs of the primaries are paler than in *a*, *b*, *c*, sometimes not much so, but often nearly as light, but not quite so clear white, and the colours evidently not so sharply defined as in *P. assimilis*.

There is nothing peculiar in the distribution of *P. bailloni* as accepted here, petrels of course, in spite of their pelagic life, being bound to coasts and islands for nesting purposes, and seldom being seen far away from land. On the other hand, further studies are required to confirm—as we hope—our present view on these forms.

e. **Puffinus obscurus assimilis** Gould.

Puffinus assimilis, Gould in *Proc. Zool. Soc.* 1837. p. 156 ; id. *Birds Australia*, VII. Pl. LIX. (1848); Salvin, *Cat. B. Brit. Mus.* XXV. p. 384 (partim, specimens *z* to *d*[1]).
P. nugax, Bonaparte *Consp. Av.* II. p. 205 (1857) (ex Solander MS.).

This form inhabits the New Zealand and Australian seas; but we do not yet know exactly where its limits are in the north, towards the seas inhabited by the true *P. obscurus*. The forehead is very light. Its under tail-coverts are **invariably pure white.** The outer webs and about 3 or 4 mm. of the inner webs of the first primaries are dark, the rest of the inner web mostly **pure white,** this colour sharply defined against the blackish brown. Above with a rather bluish tint. Sides of head as in *P. bailloni*. This form is very distinct, and we have before us twenty skins from the New Zealand seas.

In the literature on all these forms we find the most correct remarks from Messrs. Finsch & Hartlaub, but unfortunately they applied the name *P. obscurus* to the Atlantic and Indian Ocean form, mistaking Christmas Island near the Fanning group for Christmas Island south of Java! The want of knowledge or scarcity of wit shown in using names which are already used elsewhere for islands, towns or lands, have often caused similar errors. The American writers (Ridgway chiefly) have also distinguished between the various forms of these *Puffini*, but they have never given a review including all of them. Salvin's treatment in the *Catalogue of Birds* cannot be followed in our opinion. The distribution he ascribes to *P. assimilis*—viz. Australian and New Zealand seas and North Atlantic Ocean, while he allows *P. obscurus* to occur between these countries, at Bourbon, the Seychelles, and again on the coasts of Great Britain, the West Indies and Pacific Ocean—would be a most peculiar one. The material in the British Museum does seem to lead to Salvin's view, but we are not prepared to accept it. While the skins from near Madeira and the Canary Islands in the British Museum have a great deal of white on the inner webs of the primaries and most closely resemble the true *P. assimilis*, we do not think that they agree in all the characters alluded to above, and we have some from the Canary Islands which are so dark on the inner webs of the primaries that they would be better united with *P. obscurus* than with *P. assimilis*, while those from the Cape Verd group are all much darker on the primaries than any *P. assimilis*. Those from the Madagascar region (Réunion, etc.), are more like *P. obscurus* than like *P. assimilis*, but we think they belong to neither of the two forms strictly, and we have provisionally united with them the North Atlantic form (see *anteà*).

f. **Puffinus auricularis** Townsend,

of which we have received an adult *female* caught by R. H. Beck in the Pacific Ocean at lat. 21° 10′, long. 115° 38′, differs from all these forms at a glance by its much larger size.

g. **Puffinus opisthomelas** Coues,

of which we have in the Tring Museum a fine adult *male* from Monterey, California, is still much larger than *P. auricularis*, and the axillaries are blackish towards their tips and tipped narrowly with white.

These two latter forms we consider worthy of specific rank, while all the others cannot be looked upon as more than slightly separated subspecies.

Genus AESTRELATA Bp.

Aestrelata, **Bonaparte**, *Consp. Av.* II. p. 188 (1856).

Almost cosmopolitan (pelagic).

1. **Aestrelata phaeopygia** Salv.

Oestrelata phaeopygia, **Salvin** in *Trans. Zool. Soc. Lond.* IX. p. 507 (1876), Pl. LXXXVIII. figs. 1, 3; **Wilson**, *Aves Hawaiienses*, Part V. (1894); **Salvin**, *Cat. B. Brit. Mus.* XXV. p. 407 (1896).
Aestrelata phaeopygia, **Ridgway** in *Proc. U.S. Nat. Mus.* XIX. p. 648.

This species is only known from the Galapagos Archipelago, but according to Salvin the specimens described under the name of *Aestrelata sandwichensis* from the Sandwich Islands (Ridgway in Baird, Brewer, and Ridgway's *Water Birds N. Amer.* II. p. 395 (1884) are not separable from it, while Ridgway, after first uniting them, is now doubtful about their identity.

We have received *Ae. phaeopygia* from Albemarle, Wenman, and Indefatigable Islands, and from between Barrington and Indefatigable Islands. It is also on record from Charles Island. An adult *male* caught off Wenman, on August 3rd, 1897, had a length of 15·50 in., an extent of 39·50 in. "The bill is black, feet light bluish flesh colour, lower portion about half of webs and toes black, this colour extending along the outer toe and one fourth of an inch up on the tarsus. Iris brown."

Genus OCEANODROMA Rchb.

Oceanodroma, **Reichenbach**, *Syst. Av.* p. 4 (1852).

1. **Oceanodroma cryptoleucura** (Ridgw.).

Cymochorea cryptoleucura, **Ridgway** in *Proc. U.S. Nat. Mus.* IV. p. 337 (1882).
Oceanodroma cryptoleucura, **Townsend** in *Bull. Mus. Comp. Zool.* XXVII. p. 125; **Wilson**, *Aves Hawaiienses*, Pt. IV. plate and text (1893); **Rothschild**, *Avifauna of Laysan*, pt. I. p. 53 (1893); **Salvin**, *Cat. B. Brit. Mus.* XXV. 350.

This petrel was for the first time described from Kauai, one of the Sandwich Islands in the North Pacific Ocean, and Mr. Townsend procured it off Wenman Island and off Albemarle Island. We have no skins whatever from the Galapagos group of islands. This petrel is also found in the Atlantic Ocean from St. Helena to Madeira, and on the Cape Verd Islands. A comparison of a larger material from the Hawaiian, Galapagos, and Atlantic islands is desirable, as it is quite possible that some slight differences between specimens from the various oceans might be found.

Genus OCEANITES Keys. & Blas.

Oceanites, **Keyserling & Blasius**, *Wirbelth. Europ.* II. p. xciii. (1840).

Seas of greater part of world.

1. **Oceanites gracilis** (Elliot).

Thalassidroma gracilis, **Elliot** in *Ibis*, p. 391 (1859).
Oceanites gracilis, **Ridgway** in *Proc. U.S. Nat. Mus.* XIX. p. 658; **Salvin**, *Cat. B. Brit. Mus.* XXV. p. 361

The greyish white edges to the greater wing-coverts, white middle of abdomen, entirely different dimensions, and other characters, serve to distinguish this species

at a glance from *O. oceanicus*. It is so far only known from the coast of Chili and the Galapagos Archipelago, where it evidently breeds. We have a large series from Albemarle, Narborough, Chatham, James, Charles, Abingdon, and Bindloe Islands, and the surrounding waters. It was generally observed more frequently in the southern portion of the archipelago than *Procellaria tethys*, and rarely farther from shore than about one mile.

Genus PROCELLARIA L.

Procellaria, Linnaeus, *Syst. Nat.* ed. 10, I. p. 131 (1758).

Atlantic Ocean and Galapagos Archipelago.

(The genera *Procellaria*, *Halocyptena*, and *Oceanodroma* are so closely allied that they hardly require generic separation, but the characters mentioned in *Cat. B. Brit. Mus.* XXV. p. 343 can serve to distinguish them.)

1. **Procellaria tethys** Bp.

Procellaria tethys, Bonaparte in *J. f. Orn.* p. 47 (1853), and in *Compt. Rend.* XXXVIII. p. 662 (1854); *op. cit.* XLII. fig. 769 (1856); Salvin in *Trans. Zool. Soc. Lond.* IX. p. 507, Pl. LXXXVIII. fig. 2 (1876); Ridgway in *Proc. U.S. Nat. Mus.* XIX. p. 656; Salvin, *Cat. B. Brit. Mus.* XXV. p. 346.

This little petrel is only known from the Galapagos Archipelago and contiguous waters. Townsend found it at lat. 4° 22′ north, long. 82° 32′ west, and about 400 and 600 miles east of the Galapagos Islands. We have received it from the sea round Wenman, Culpepper, Albemarle, and Tower Islands. It was seen far more abundant in the northern portion of the archipelago and generally far out to sea.

Genus SPHENISCUS Briss.

Spheniscus, Brisson, *Orn.* VI. p. 96 (1760).

Southern seas, north to the Galapagos Islands and South Brazil.

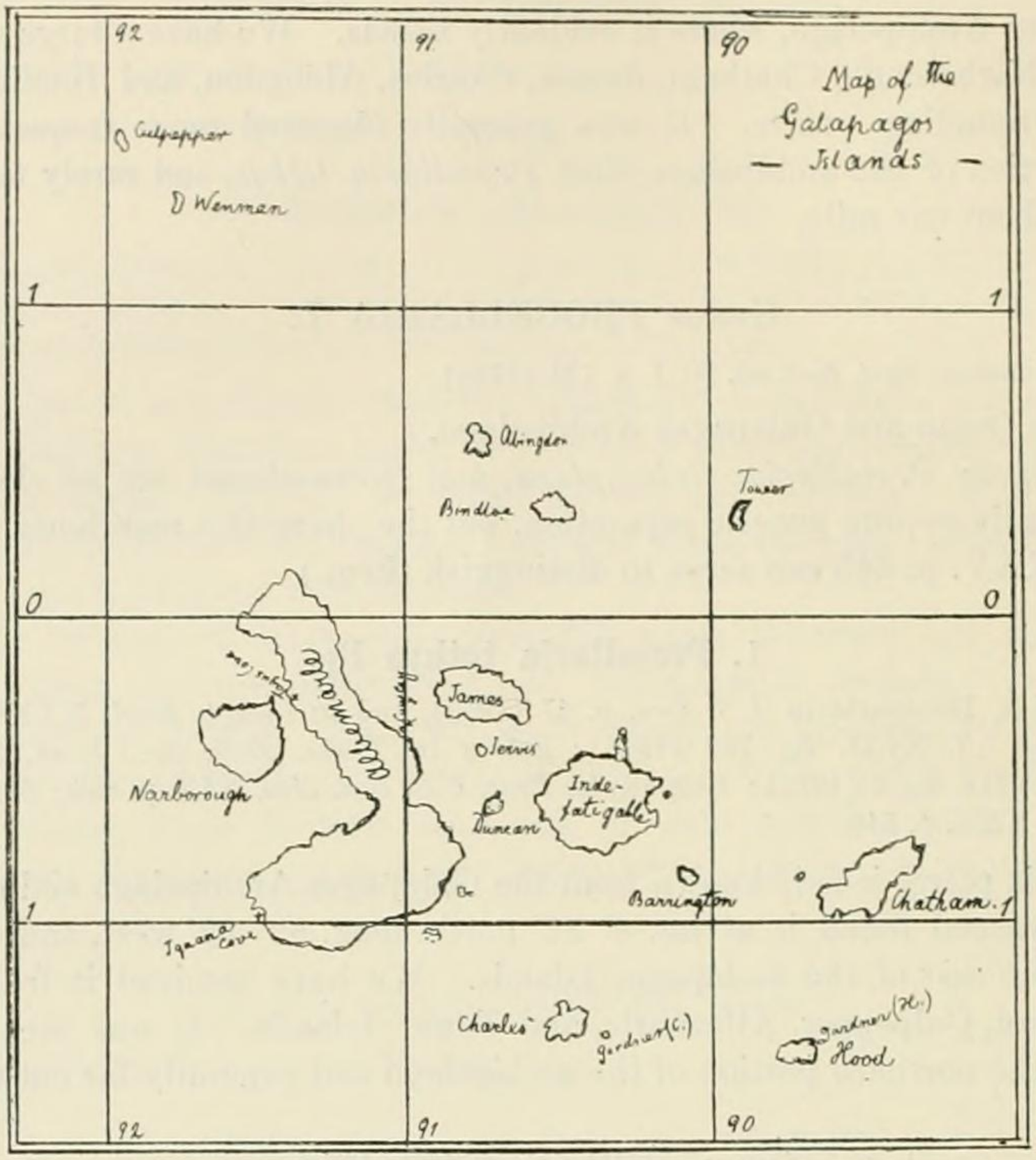
1. **Spheniscus mendiculus** Sund.

Spheniscus mendiculus, Sundevall in *Proc. Zool. Soc.* pp. 126, 129 (1871); Salvin in *Trans. Zool. Soc.* IX. p. 508, Pl. LXXXIX.; Wolf, *Besuch. a. d. Galapagos Ins.* p. 42 (1879); Ridgway in *Proc. U.S. Nat. Mus.* XIX. p. 660; Grant, *Cat. B. Brit. Mus.* XXVI. p. 653 (1898).

Nearest to *S. magellanicus*, but with longer and more slender bill, and smaller in size. Chin and upper part of the throat white; superciliary line narrower; the flippers have no trace of a white margin on the inner edge; the dusky band across the fore-neck is not well defined.

The plumage of the adult bird is well described by the authors quoted above. The *female* differs from the *male* at a glance in being much smaller. The immature bird has no white superciliary line, all the area below where it runs in the adult bird, right across the throat being white, shaded with grey on the sides of the head. The foreneck is blackish grey, somewhat mottled with white. The adult bird, in both sexes, has the iris reddish brown, the bill black, basal two-thirds of mandible flesh-colour, feet black, sometimes more or less spotted on the toes or webs with light pinkish creamy buff, but there is no record or note on any of our labels of a well-defined orange fore-parts of the webs as shown on the plate in the *Transactions Zool. Soc.* IX.

We have received a large series from Albemarle Island, and a few from Duncan and Brattle.



VI.

LIST OF BIRDS KNOWN TO OCCUR ON THE GALAPAGOS ISLANDS.

Genus NESOMIMUS.

!	1. *N. trifasciatus*	Gardner, near Charles Island (formerly Charles).
!	2. *N. macdonaldi*	Hood and Gardner near Hood Island.
!	3. *N. adamsi*	Chatham Island.
!	4. *N. melanotis personatus* . .	Abingdon Island.
!	5. *N. melanotis melanotis* . .	Indefatigable, Jervis, James, Wenman Islands.
!	6. *N. melanotis carringtoni* . .	Barrington Island.
!	7. *N. melanotis hulli* . . .	Culpepper Island.
!	8. *N. melanotis bauri* . . .	Tower Island.
!	9. *N. melanotis bindloei* . . .	Bindloe Island.
!	10. *N. parvulus parvulus* . . .	Albemarle Island.
!	11. *N. parvulus affinis* . . .	Narborough Island.

Genus DENDROICA.

(?!)	12. *D. aureola*	All islands.

Genus CERTHIDEA.

!	13.	*C. olivacea olivacea* . . .	Central group.
!	14.	*C. olivacea luteola* . . .	Chatham Island.
!	15.	*C. olivacea ridgwayi* . . .	Charles Island.
!	16.	*C. olivacea becki*	Wenman Island.
* !	17.	*C. olivacea drownei* . . .	Culpepper Island.
!	18.	*C. olivacea mentalis* . . .	Tower Island.
!	19.	*C. olivacea fusca* . . .	Abingdon and Bindloe Islands.
!	20.	*C. cinerascens cinerascens* . .	Hood Island.
!	21.	*C. cinerascens bifasciata* . .	Barrington Island.

Genus PROGNE.

!	22.	*P. concolor*	Most islands.

Genus HIRUNDO.

	23.	*H. rustica erythrogastra* . .	(Migrant).

Genus GEOSPIZA.

* !	24.	*G. magnirostris*	? Charles Island.
!	25.	*G. strenua*	Most islands.
!	26.	*G. darwini*	Culpepper Island.
!	27.	*G. conirostris conirostris* . .	Hood Island.
!	28.	*G. conirostris brevirostris* . .	Charles Island.
!	29.	*G. conirostris propinqua* . .	Tower Island.
* !	30.	*G. conirostris* subsp. ? . .	Culpepper Island.
* !	31.	*G. conirostris* subsp. ? . .	Indefatigable Island.
!	32.	*G. dubia dubia*	Chatham (Barrington, Duncan ?).
!	33.	*G. dubia albemarlei* . . .	Albemarle, Narborough Islands.
!	34.	*G. dubia bauri*	James Island.
!	35.	*G. dubia simillima* . . .	Charles Island.
!	36.	*G. fortis fortis*	Most central and southern islands.
!	37.	*G. fortis fratercula* . . .	Abingdon and Bindloe Islands.
!	38.	*G. fuliginosa fuliginosa* . .	Central and southern islands.
!	39.	*G. fuliginosa minor* . . .	Abingdon, Bindloe Islands.
!	40.	*G. acutirostris*	Tower Island.
* !	41.	*G. dentirostris*	? Charles Island.
* !	42.	*G.* sp. inc.	Chatham Island.
!	43.	*G. scandens scandens* . . .	James Island.
!	44.	*G. scandens intermedia* . .	Charles Island.
!	45.	*G. scandens fatigata* . . .	Central group.
!	46.	*G. scandens abingdoni* . .	Abingdon, Bindloe Islands.
!	47.	*G. scandens septentrionalis* . .	Wenman, Culpepper Islands.
!	48.	*G. pallida*	Central group.
!	49.	*G. crassirostris*	Most islands.
!	50.	*G. psittacula psittacula* . .	Most central islands.
* !	51.	*G. psittacula townsendi* . .	Charles Island.
!	52.	*G. affinis*	Albemarle, Narborough Islands.

! 53. *G. incerta* . . . . . James Island, ? Duncan Island.
! 54. *G. habeli* . . . . . Abingdon, Bindloe Islands.
! 55. *G. paupera* . . . . . Charles Island.
! 56. *G. salvini* . . . . . Chatham Island.
! 57. *G. prosthemelas* . . . . Most islands.

Genus DOLICHONYX.

58. *D. oryzivorus* . . . . Irregular visitor.

Genus MYIARCHUS.

! 59. *M. magnirostris* . . . . All islands.

Genus PYROCEPHALUS.

! 60. *P. nanus* . . . . . Nearly the whole group.
! 61. *P. dubius* . . . . . Chatham Island.

Genus COCCYZUS.

62. *C. melanocoryphus* . . . ? Visitor (several islands).

Genus BUTEO.

! 63. *B. galapagoensis* . . . Generally distributed.

Genus STRIX.

! 64. *S. punctatissima* . . . . Probably several islands. (Not found recently.)

Genus ASIO.

! 65. *A. galapagoensis* . . . Generally distributed.

Genus FREGATA.

66. *F. aquila* . . . . . (Sea-bird. Breeding.)

Genus PELECANUS.

67. *P. fuscus californicus* . . . (Sea-bird. Breeding.)

Genus SULA.

68. *S. piscatrix websteri* . . . (Sea-bird. Breeding.)
(?!) 69. *S. variegata* . . . . (Sea-bird. Breeding.)
70. *S. nebouxi* . . . . . (Sea-bird. Breeding.)
* 71. *S. brewsteri* . . . . (Occurrence doubtful.)

Genus PHALACROCORAX.

! 72. *P. harrisi* . . . . . Narborough Island.

GENUS PHAËTHON.

73. *P. aethereus* . . . . (Sea-bird. Breeding.)

GENUS ARDEA.

74. *A. herodias*. . . . . Breeds on several islands.

GENUS HERODIAS.

75. *H. egretta* . . . . . Albemarle Island.

GENUS BUTORIDES.

! 76. *B. plumbeus* . . . . Generally distributed.

GENUS NYCTANASSA.

77. *N. violacea* . . . . . Generally distributed.

GENUS PHOENICOPTERUS.

78. *P. ruber* . . . . . Most islands. Breeding on 2 or 3 islands.

GENUS POECILONETTA.

! 79. *P. bahamensis galapagensis* . Generally distributed.

GENUS QUERQUEDULA.

* 80. *Q. versicolor* . . . . (Once, acc. to Sundevall.)

GENUS NESOPELIA.

! 81. *N. galapagoensis galapagoensis* . Nearly the whole group.
! 82. *N. galapagoensis exsul* . . Wenman, Culpepper Islands.

GENUS CRECISCUS.

! 83. *C. spilonotus* . . . . James Island.
! 84. *C. sharpei* . . . . . Indefatigable Island.

GENUS GALLINULA.

85. *G. galeata* . . . . . (Occasional.)

GENUS HAEMATOPUS.

! 86. *H. galapagensis* . . . . Most islands.

GENUS AEGIALITIS.

87. *A. semipalmata* . . . . (Migrant.)

GENUS CALIDRIS.

88. *C. arenaria* . . . . (Migrant.)

GENUS ARENARIA.

89. *A. interpres* . . . . (Migrant.)

GENUS SQUATAROLA.

90. *S. squatarola* . . . . (Migrant.)

GENUS HETEROPYGIA.

91. *H. bairdi* . . . . . (Migrant.)

GENUS TRINGA.

92. *T. minutilla* . . . . (Migrant.)

GENUS HETERACTITIS.

93. *H. incanus* . . . . . (Migrant.)

GENUS HELODROMAS.

94. *H. solitarius* . . . . (Migrant.)

GENUS NUMENIUS.

95. *N. hudsonicus* . . . . (Migrant.)

GENUS HIMANTOPUS.

96. *H. mexicanus* . . . . Several of the islands.

GENUS LARUS.

! 97. *L. fuliginosus* . . . . Generally distributed.

GENUS XEMA.

! 98. *X. furcata* . . . . . Generally distributed and on Cocos Island.

GENUS STERNA.

99. *S. fuliginosa* . . . . Wenman, Culpepper. (Breeding.)

GENUS ANOUS.

! 100. *A. stolidus galapagensis* . . Generally distributed.

GENUS STERCORARIUS.

101. *S. pomarinus* . . . . (Accidental.)

Genus DIOMEDEA.

! 102. *D. irrorata* . . . . . Hood Island.

Genus PUFFINUS.

! 103. *P. obscurus subalaris* . . . . Generally distributed.

Genus AESTRELATA.

104. *A. phaeopygia* . . . . . Sea-bird. Probably most islands.

Genus OCEANODROMA.

105. *O. cryptoleucura* . . . . Procured once.
! 106. *O. gracilis* . . . . . Most islands and coast of Chili.

Genus PROCELLARIA.

! 106. *P. tethys* . . . . . Near most islands.

Genus SPHENISCUS.

! 108. *S. mendiculus* . . . . . Most islands.

In this list the forms which are only known from the Galapagos Islands and the sea close by, are marked with a !, those which are of doubtful validity or of doubtful occurrence are marked with a *. The exact distribution in the archipelago is given where it is of special interest. For details the discussion on the different species may be consulted.