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X. *On the Avifauna of the Galapagos Archipelago.*
By OSBERT SALVIN, M.A., F.R.S., &c.

Read April 6th, 1875.

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I. INTRODUCTORY REMARKS.

IN the volume of the Society's 'Proceedings' for 1870 Mr. Sclater and I published a brief summary of an important collection of birds made by Dr. Habel in the Galapagos Islands¹. The object of the present memoir is to give the particulars of that collection in greater detail, to incorporate the notes on the habits and other peculiarities of the birds drawn up by Dr. Habel himself, and to treat generally of the avifauna of this singular group of islands.

To make my paper more complete I have added a short account of the history, structure, and physical features of the islands with regard to their bearing on the indigenous products. This account is drawn from the writings of various travellers; and to it I have added an account of his visit, furnished by Dr. Habel himself.

The Galapagos archipelago (Pl. LXXXIV.) comprises a group of fifteen islands, together with a number of outlying rocks, which, situated under the equator, and, extending a degree and a half on either side of it, cover about three degrees of longitude (from 89° to 92° W. of Greenwich). They are about 600 miles to the westward of the coast of South America, and belong to the Republic of Ecuador.

One island, Albemarle², is considerably larger than the rest; four others, Narborough,

¹ P. Z. S. 1870, pp. 322-327.

² *Nomenclature of the Islands*.—The names I have used throughout this paper are derived from the Admiralty chart (No. 1375), compiled from the surveys of Captain Fitz-Roy and the officers of H.M.S. 'Beagle.' It may,
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James, Indefatigable, and Chatham, are the next in point of dimensions; Charles, Hood, Bindloe, and Abingdon make up the nine chief islands of the archipelago. Barrington, Tower, Duncan, and Jervis are small, unimportant islands; whilst the two northernmost, Wenman and Culpepper, are little more than isolated rocks. The highest mountain in Albemarle reaches 4700 feet; and in most of the other islands the mountains attain a height of from 1000 to 1700 feet. The whole of the group is of volcanic origin; and some of the islands present surfaces little else than masses of scoriæ and vast fields of lava. The most ancient signs of volcanic action are to be found in the more eastern islands of the group, whilst the western are still the scene of occasional outbursts of volcanic energy. Narborough, the most western island of all, is frequently in a state of violent eruption, the island itself being little more than one vast furnace, from which lava has issued over the entire surface. Mr. Darwin estimates that in the whole archipelago there are as many as 2000 craters. Travellers within the last century speak of having observed various eruptions on the westernmost islands.

Delano witnessed an outbreak of one of the volcanos of Albemarle in 1800, and speaks of another which occurred in 1797. Captain Porter describes an eruption which took place on the same island on the 6th June, 1813. He also says that on his return to the islands after a visit to the continent, he remarked great changes on the south side of Narborough and the southern part of Albemarle, and observed four craters smoking on the former island and one on the latter. He also remarks that a volcano burst out with great fury a few hours after he left Charles Island. Captain Morrell, when anchored in Tagus Cove in 1825, between Narborough and Albemarle, witnessed a terrific eruption from Narborough. He was obliged to run from his anchorage and make his way southward, the temperature of the air being sometimes as high as 147° , that of the water 150° from the molten lava flowing into it! During the short visit of Lord Byron in H.M.S. 'Blonde,' in 1825, one of the volcanos of Albemarle was observed to be in eruption; and Captain Fitz-Roy states that the south-

however, not be out of place to say a word respecting the different names which have been applied to some of the islands of the group.

The original Spanish name for the Archipelago is so apt that no other seems ever to have been suggested for it. The Spaniards also bestowed names on the particular islands; but they have never become established or even recognized, except Redonda Rock. The names applied by Captain Cowley in 1684 are those by which they are chiefly known; and most of them have been adopted in the Admiralty chart. Thus Narborough Island, Albemarle, James, Bindloe, Abingdon, Wenman, and Culpepper have all been recognized from Cowley's map. Norfolk Island of Cowley is, I have no doubt, Indefatigable Island of the present day, Porter's Island being another name for it. The Charles Island of Cowley is probably the same as Chatham Island of Colnett, not the Charles Island of the chart, and is perhaps the Santa Maria de la Aguada of the Spaniards. Cowley's Eures Island is probably Tower Island; Cowley's Crossman's Island and Brattle's Island are perhaps Hood and Charles Islands, though these names have been applied to two clusters of rocks off the south-eastern shore of Albemarle. Dean's Island may be Duncan Island of Colnett, Downes Island of Porter.

eastern volcano of the same island emitted smoke, but no flame, during his visit in 1835.

Owing doubtless to the severity of the volcanic action in the westernmost islands, the vegetation is described as very scanty. Narborough appears to be quite barren, except a few mangroves growing along its eastern shore. The northern end of Albemarle is described by Darwin as miserably sterile; but the southern side, exposed as it is to the prevailing moisture-laden south-easterly wind, is thickly wooded, and very green. Most of the other islands bear a scanty vegetation, some, such as James Island, having trees two feet and even two feet nine inches in diameter. The contrast, however, between the vegetation of the whole archipelago and that of the adjoining coast is very great.

The climate of the Galapagos is described as mild for its situation under the equator, the surrounding water being of low temperature from the influence of the south polar current. Little rain falls, except during the months of November, December, and January; clouds, however, usually hang over the higher mountains, where the deposit of moisture is far greater than on the sea-shore; and consequently the vegetation of the upper portion of most of the islands is more luxuriant.

The ocean-currents which flow through the Galapagos are strong, varying from one mile to three miles an hour. They appear, judging from the Admiralty chart, and allowing for the obstruction opposed by the various islands, to be tolerably uniform in their direction, trending to the north-west. As light winds and calms are frequently experienced, these currents make the navigation difficult to sailing ships, and we read of vessels being days and even weeks in endeavouring to beat against their course.

The position of the Galapagos Islands appears to have been first indicated in the Spanish manuscript charts of the sixteenth century; but no record of the date of their discovery, nor yet of the discoverer, has been left.

In the Latin edition (the first) of De Bry's 'Grands Voyages' there is a map bearing the date 1592, in the "Americæ tertia Pars," where these islands are indicated a little to the northward of the equator, and are called "Ys de los Galopegos." The map itself is called "Americæ pars magis cognita." This is the earliest published reference I can find to the archipelago.

In the following year Hawkins, the contemporary of Drake, mentions the islands casually in his 'Observations in a Voiage into the South Seas, anno domini 1593.' In mentioning Cape Passaos, on the west coast of South America, he says (p. 122), "it lyeth directly under the Equinoctiall line: some fourescore leagues to the westwards of this cape lyeth a heape of Ilands, the Spaniards call Illas de los Galapagos; they are desert and beare no fruite."

The Spaniards established themselves on the shores of the Pacific at Panama about the year 1519; and in 1525 Pizzaro made his first expedition to Peru. It would be probably soon after this that the islands were discovered and named, as their existence appears to have been commonly known at the time of Hawkins's expedition.

Towards the end of the seventeenth century the Buccaneers, of whose exploits Dampier and others have left such admirable accounts, made the Galapagos Islands a place of frequent resort. In 1680 Captain Sharp, in the journal of his expedition, mentions that on the 6th June he sailed from the island of Quibo "with a design to visit the Isles of Gallapallo that are a parcel of islands lying under the equator." He does not appear to have carried out his intention; for the next place he mentions is the island of Gorgona. In 1684 Dampier himself describes his visit to these islands.

This is the earliest published account concerning them that I can find.

In May 1684 two Buccaneer ships were lying off the island of "Lobos de la Mar" meditating a descent upon the Spanish town of Truxillo, when three Spanish ships, laden with provisions for Panama, hove in sight. They were captured; and from information given them by their prisoners the Buccaneers determined to sail westward to the Galapagos Islands, of the existence of which they were aware from the Spaniards, in whose maps their position was indicated.

Of the two Buccaneer ships which formed the squadron in 1684, one was commanded by Captain Cook, in which Dampier sailed and also Captain Cowley; the other was commanded by Captain Eaton. Captain Cowley has also left an account of the voyage; and he it was who gave to most of the islands the names by which they are now known.

The object of the Buccaneers was to hide up a portion of their captured provisions for future use, and to lie by for five or six months until the alarm of the inhabitants of the adjoining coast had subsided, when they proposed to resume their depredations.

Cowley says that they came to anchor at the northernmost end of an island which he called the Duke of York's Island, but in his map King James's Island, the Duke of York having come to the throne of England as James II. during Cowley's absence. He says there was great plenty of provisions, fish, sea- and land-tortoises, and also an abundance of fowls, viz. Flamingoes and Turtle Doves, the latter whereof were so tame that they would often alight on their hats and arms. After landing some stores of provisions, they commenced searching the islands for water, when the strong current seized their ships; and failing to regain their anchorage off James's Island, they bore away to the mainland of Central America.

Dampier's account of the trip differs a little from Cowley's, as he says they first anchored at the eastern end of the easternmost island. Dampier says they stayed only twelve days amongst the islands, and then, trying to touch at Cocos Island, but failing, made straight for Cape Blanco, at the entrance of the Gulf of Nicoya.

Dampier incidentally mentioning the doings of some of the other Buccaneer ships with whom he often sailed in consort, says that Captain Davis spent three months in the Galapagos, living solely, himself and his crew, on tortoises, and that Captain Harris also visited the islands.

A short account of the islands, very similar to Dampier's, is given by Lionel Wafer, Dampier's "chirurgion." He speaks of taking off some of the flour left during the former voyage, a great deal of which he said had been devoured by the turtledoves. The chief interest of Wafer's narrative is his description of the Darien Indians, with whom he resided some time. Being injured by an accident, he was left behind by his companions when crossing the isthmus to the south seas. The Indians treated him well; and he ultimately rejoined his fellow Buccaneers nearly naked and painted like a savage.

Captain Woods Rogers, the rescuer of Alexander Selkirk from the Island of Juan Fernandez, was the last of the Buccaneers who has left any account of the Galapagos. He visited them twice—once in May 1709, and again in September of the same year. As usual the Tortoises are the animals that came in for the chief share of attention; but Rogers also noticed the tameness of the Hawks "of several sorts," and of the Turtle Doves. He also says that most sorts of sea-birds are to be found about the islands.

For nearly a century no further notice is recorded of these islands, though doubtless they were frequently visited, first by the Buccaneers, and afterwards by the whale-ships, which commenced cruising in the Pacific towards the close of the 18th century.

To extend the knowledge of these seas by more accurate surveys, and thus to encourage and facilitate the Sperm-Whale fisheries, Captain James Colnett, R.N., was despatched by Messrs. Enderby & Sons in the ship 'Rattler,' which had been purchased of the English Government and fitted out as a whaler. The 'Rattler' came in sight of the Galapagos on 24th June, 1793, and left again early in July. A map of the islands accompanies Captain Colnett's relation of his voyage, which, though imperfect in many respects, is the first published approaching to accuracy, and the first in which the longitudes are given approximately.

Incidental mention is made of Turtle Doves and considerable flocks of Teal. He adds that he saw no great variety of land-birds, and what he did see were not remarkable for beauty or novelty. He mentions a "Flycatcher" and Creeper "like those of New Zealand," a "bird resembling a small mocking bird," "a Black Hawk," and a "bird of the size of our Blackbird," and "Ring Doves of a dusky plumage."

Colnett expresses himself perplexed to form a satisfactory conjecture how the small birds supported themselves without water, till some of his party observed an old bird in the act of feeding three young ones by squeezing a berry of a tree into their mouths. He adds that in dry seasons thousands of birds must perish for want of water, for he found numbers dead in their nests, some being almost fledged. Of sea-birds he mentions Flamingoes, Sea-Pies, Plovers, and Sand-Larks. Colnett returned again to Galapagos on his homeward voyage, and came in sight of Chatham Island on 12th March, 1794, where he refreshed some of his sick crew with a diet of Turtle and Teal

soup. He then cruised about for some days, catching several Sperm Whales. Whilst cruising round the south point of James Island he mentions seeing great numbers of Penguins (p. 156). "There were also," he adds, "small birds with red breasts, and others resembling the Java Sparrow in shape and size, but of a black plumage; the male was darkest, and had a very delightful note." The 'Rattler' finally left the Galapagos on 16th May, 1794.

The next account we have is by Captain Amasa Delano, who visited the Galapagos in 1801, and in the account of his voyages devotes a chapter to the description of the islands. In this he adds considerably to the information concerning them given by Colnett; and his account is interesting in many particulars. Allusions are frequently made to the birds. He speaks of a small kind of Albatross on James Island (probably *Estrelata phæopyga*) which he describes as not laying its eggs in "rookeries," but to be found sitting and hatching on the burnt stony ground. He also mentions on the same islands Pelicans laying their eggs in nests built in trees, Flamingos, Gulls, Teals, Rooks (what these can be I know not), a small kind of Heron, and two or three kinds of Sparrows. The habits of several of these species are fully described, as well as the method of killing Turtle Doves with sticks. An account is also given of an eruption of one of the volcanos of Albemarle seen during a former visit on 21st August, 1800; and he mentions another eruption as having taken place in 1797.

By this time the Sperm-Whale fishery seems to have become so much developed in the seas surrounding the Galapagos Islands that they were chosen as a rendezvous by Captain David Porter, of the U.S. Frigate 'Essex,' during the war between England and America in 1812-13. Here he lay in wait for the English whalers as they came to water their vessels and to catch tortoises, fresh food being very necessary for the maintenance of the health of their crews. The 'Essex' remained cruising about the islands, with one interval, when she visited the mainland, from 17th May to 2nd October, 1813.

Captain Basil Hall, in H.M.S. 'Conway,' in 1822 spent several days on Abingdon Island, when he was engaged measuring the length of a pendulum to beat seconds under the equator. In his journal he briefly describes the volcanic features of this island, but makes no allusion to the birds.

Lord Byron, in H.M.S. 'Blonde,' on his outward voyage to the Sandwich Islands in 1825, anchored in Tagus Cove. A short account of the visit is published in the 'Voyage of the 'Blonde.' He speaks of the number of the aquatic birds, and the tameness of the small birds, which hopped upon their feet. During the few days the vessel remained in Banks's Bay one of the volcanos of Albemarle was in eruption. An ineffectual attempt was made to land on Abingdon Island to search for tortoises; but the current prevented this being accomplished, and the vessel bore away for the Sandwich Islands.

In the same year Captain Morrell also visited the same island, and, in the narrative

of his voyage, describes an eruption of a volcano in Narborough so intense that he was obliged to slip from his anchorage to escape from the heat.

H.M.S. 'Beagle,' Captain Fitz-Roy, with Mr. Darwin as naturalist, spent part of September and part of October 1835 in surveying the Galapagos. Captain Fitz-Roy's 'Narrative' and Mr. Darwin's 'Journal' contain by far the most complete account ever published of the archipelago. Both these works, especially the latter, are so well known that it is needless for me to enter into any details respecting them. Mr. Darwin describes the islands he visited himself. Captain Fitz-Roy gives a short account of the chief islands of the group, partly gathered from his own observations, and partly from the officers employed in making the surveys.

Subsequently to Mr. Darwin's visit several surveying ships have called at the Galapagos; and in the narratives of the different voyages, accounts more or less complete have been drawn up. These are for the most part descriptive of the scenery and the physical features of the country, very little being contained in them having any special bearing upon my present subject. An excellent summary of the various accounts is given by Mr. A. G. Findlay in his 'Directory for the Navigation of the Pacific Ocean.' But for the benefit of those who may wish to consult the original works, I append a list of some of their titles, so far as I have been able to ascertain them. Other useful matter will be found in Mr. Findlay's volumes just mentioned.

In concluding this portion of my subject I may mention that an account of the flora of the Galapagos, as far as it was then known, has been given in two papers by Dr. J. D. Hooker in the 'Transactions' of the Linnean Society, vol. xx. pp. 163-262 (1847), and that a memoir on the large tortoises is in course of publication in the 'Philosophical Transactions,' by Dr. Günther.

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[See also Dampier, vol. iv. 1729 edition.]

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[See also Dampier, vol. iii. edition of 1729.]

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- BELCHER, Sir EDWARD. Narrative of a Voyage round the World in H.M.S. 'Sulphur.' 2 vols. 8vo. London, 1843.
- COULTER, JOHN, M.D. Adventures in the Pacific: with Observations on the Natural Productions, Manners, and Customs of the Natives of the various Islands. 8vo. Dublin, 1845.

Various attempts to colonize the Galapagos.

At various times people have lived in the Galapagos; but these attempts at colonization do not seem to have been permanently successful. The first person who took up his abode there was an Irishman of the name of Patrick Watkins, who settled himself on Charles Island, living on tortoises and growing potatoes, with which he traded with the whalers. He went to Guayaquil in an open boat in 1809 to look for a wife, and was there killed.

In 1832 Don José Villamil bought two of the islands from the Government of Ecuador, to one of which (Charles Island) he brought over all the inmates of the prisons of Guayaquil. These he established in the centre of the island.

Mr. Darwin, at the time of his visit, estimated the number of these colonists at 200; and he met with a party of them on James Island, where they had gone to fish and catch tortoises. This colony in 1849 had diminished to about twenty-five persons, the stock of tortoises failing, and with them the inducement to whaling-ships to call. Whether any persons remain on Charles Island at the present time I have not been able to ascertain.

In 1838, Wreck Bay, in Chatham Island, was inhabited by a native of Guayaquil and an Englishman, who maintained themselves by supplying American whalers with tortoises and vegetables.

In 1872 the 'Hassler,' with Professor Agassiz on board, reported one or two little colonies on Indefatigable Island, leading a hard life, the prospect of any kind of agriculture being successfully carried on being very remote (see 'Nature,' 1872, p. 354).

The advent of man to islands previously uninhabited is of the highest importance to the existence of a peculiar indigenous fauna and flora; and this is my reason for having endeavoured to trace the date of the discovery of the Galapagos archipelago, and to sketch out the intercourse since maintained with the outer world. As will be seen above, I have been only partially successful; but it may be safely said that these islands have been visited from time to time for more than three centuries; so that during this period man's influence has been more or less felt by the indigenous products. This influence is manifested in all similar cases by the capture and destruction for food of all animals fit to eat; and in order to establish a supply of fresh food for vessels in need of it, pigs and goats are usually turned out in such places. The vegetation chiefly suffers from the latter, while upon such animals as easily fall a prey to the former, the effect is generally very speedily marked. Cats often abound on such islands, and rats and mice escaped from some vessel calling for wood and water. All these prove enemies to some previously unmolested species. Fires, too, either wantonly or carelessly lighted, sometimes work great destruction.

For many years the great tortoises of the Galapagos afforded abundance of fresh food to ships in want of it; and the small Dove of the islands seems to have been destroyed in large numbers for the same purpose. But these birds, if we except the Ducks, appear to have been the only ones molested in any numbers to supply food to passing ships.

Pigs and goats do not seem to have been turned out in the Galapagos so soon after their discovery as was usually the case in other islands. I find no mention of pigs in the writings of the earlier voyagers; but Mr. Darwin says that on Charles Island there were many wild pigs and goats. This was in 1835. In 1813 Captain Porter relates how some goats belonging to his ship, which had been tethered on shore in James Island, got loose and were not recovered.

Dr. Habel saw a wild cat on Albemarle, and says that there are dogs and asses on the same island, and that dogs and asses are also to be seen on Indefatigable and Chatham Islands, horses also existing on the latter. He also speaks of wild cattle and swine on Charles Island.

So far as the birds of the Galapagos Islands are concerned, the effect produced by the visits of ships, chiefly whalers, and the attempts at colonization do not seem to have lessened their numbers at present. Judging from the records of the various authors I have been able to consult, I should say that birds are about as numerous now as they were two centuries ago. How long this will remain so is uncertain. All the species are able to fly, and thus protect themselves from the wild pigs and cats, their most open enemies. The effect upon the vegetation produced by the cattle, horses, and

goats may eventually lessen the number of birds, if not eradicate some of the species; but as so many species resort to the sea-shore for food, the destruction of the vegetation will be of less importance to them than it otherwise might. With a lessened vegetation, however, less rain would fall, and in consequence the increased difficulty in procuring water will operate against the birds maintaining their numbers.

On the whole it seems evident that the avifauna of these singular islands is menaced not only by open enemies, but also is in danger of serious injury should any further disturbance of the conditions of life supervene.

With the tortoises the mischief has all but been accomplished. The appearance of man on these islands has been to them simply fatal. They have not only been taken by hundreds as food; but pigs now roam in their haunts, destined to destroy their eggs and young whenever and wherever they can find them¹.

Dr. Habel's Account of his Visit.

“When I started on my travels in 1862 my plans did not include a visit either to South America or to the Galapagos archipelago, my intention being, after exploring Central America, to proceed westwards by way of the islands of the south seas to Japan, and thence continuing a westerly route finally to reach Europe. Circumstances, of which the chief was the high premium on gold during the war of secession in the United States, which prevented my drawing money deposited in a bank in New York, forced me to change my plans, and to direct my route first to South America and afterwards to the Galapagos archipelago as offering a rich field for investigation.

“The first obstacle I had to encounter was how to get to the islands, as they lie out of the route of all regular communication. By inquiries made in Panama in 1866, I found that my only chance of getting there was in one of the fishing-boats which occasionally sail from Guayaquil and Paita for the archipelago. On arriving at Lima in January 1868, I was told that vessels used to sail from Callao for the purpose of fishing. On making inquiries in Callao I heard that a schooner had arrived some weeks previously from the islands, but that, her enterprise having proved a failure, she would not return again. Her owner offered her to me for sale; but the means at my command did not admit of my purchasing her. I then wrote through the medium of the American Minister to the American Consul at Paita, asking him about the possibility of getting

¹ Since the above was written, H.M.S. ‘Peterel’ visited the Galapagos in July 1875; and in the Report furnished to the Admiralty some statistics are given respecting the population, trade, and produce of these islands. From this it would appear that there are living permanently on Charles, Chatham, and Albemarle Islands 43 men, 16 women, and 13 children, besides a roving band of some 80 Orchilla-pickers then working on Chatham Island. Of animals introduced, it was estimated that there existed 2500 head of cattle on Charles Island, 4000 on Chatham, none on James, and about 20 on Albermarle. Of horses, 150 existed on Charles Island, but none elsewhere. Of donkeys, 2000 on Charles, some on Chatham, large numbers on James, and 25 or thirty on Albermarle. Of goats, 300 or 400 on Charles, a few on Chatham, but none elsewhere. Pigs existed in large numbers on Charles, Chatham, and James, but none on Albermarle.

to the islands from that port. An English merchant in Lima, who owned some land near Paita, who was going there, promised to make similar inquiries. Both the answers were in the negative, that there was no chance of reaching the islands from that port. My only resource therefore lay in Guayaquil.

“On arriving there, to my great joy I heard that there were two parties engaged in collecting a kind of moss which grows on the islands, and which is sent to the English market under the name of “Orchilla,” and that these parties sent a vessel from time to time to the islands with labourers and provisions to collect and bring away the moss.

“I also found that one of the parties was engaged repairing a sloop, with the intention of despatching her to the islands. Mr. Rubira, the head of the enterprise, told me that he was himself going there as soon as two vessels now refitting were ready for sea, which he thought would be in about a fortnight. He also expressed himself ready to take me there, thinking that my knowledge of mineralogy might lead to the discovery of some mineralogical wealth, of the existence of which he felt assured.

“The two weeks for the completion of the repairs turned out to be four, when the larger of the two, a sloop (the ‘Calandra’), of about ten tons, was ready to sail. This was on the 28th of March. In this ship I had to go, while Mr. Rubira was to follow in a few days in the other vessel, a schooner-rigged craft of about two tons, which the owners called a pilot-boat. We were to meet in Ballenita, the nearest sea-port. On March 30th we met with a sloop coming from the islands, having made the passage in twenty-three days, in stormy, squally weather, and having on one occasion experienced a continuous downfall of rain of eighty-three hours’ duration.

“We arrived at Ballenita on the afternoon of April 1st, 1868, and proceeded to the town of Santa Elena, two miles distant, where I was hospitably received by Don José Valdizan.

“For a year yellow fever had prevailed in Guayaquil, though of a mild form during my stay in that city. As I had long desired to study that disease, I visited the hospitals during my sojourn in order to observe the patients afflicted with that disease. Yellow fever also prevailed at Santa Elena and in the neighbouring country and towns; and the house of Mr. Valdizan seemed to have formed a focus of infection. For several weeks cases had occurred there; and at the moment of my arrival a gentleman was lying sick with it, and four weeks before the book-keeper of the house died of it. Now the very room which the book-keeper used to occupy, and in which he died, and which since his death had never been touched or cleaned, the very clothing of the deceased hanging on the walls, his coffee-pot and other utensils standing still on the table, his trunk with his garments on the floor—this very room was assigned to me as my lodging during my expected stay. Any one can imagine my feelings as I lay down to bed the first night I slept there.

“The night of the 5th April I was taken with yellow fever, which kept me invalided for more than a month. In the meantime Mr. Rubira arrived and sailed with his two vessels for the islands; and thus my much-cherished hope to visit the Galapagos, to realize which had cost me so much anxiety, trouble, and time, was at once thwarted, and caused me much mental dejection. One hopeful ray alone remained. Mr. Rubira had said that he would soon send back the sloop with a cargo of orchilla, and that I could go out in her on her return voyage.

“Mr. Rubira had another reason for wishing for my company; he trusted to my knowledge of practical astronomy to assist the gentleman to whom the command of the sloop had been intrusted in directing the navigation. Although the captain had before visited the islands as commander of one of two vessels once constituting the navy of the Republic of Ecuador, he had not been to sea since that time, now many years ago; and consequently his nautical skill had lost too much of its freshness to ensure his being a successful commander on the present occasion.

After an absence of six weeks the sloop arrived in Ballenita, never having reached the islands, and being obliged to put back owing to her leaky condition. This circumstance restored my mind to its accustomed vigour, and helped much towards restoring my health. The sloop having been repaired, Mr. Rubira would not trust himself to her again, but hired a schooner of about forty tons, in which we left Ballenita on the morning of the 18th July, the sloop leaving at the same time. A steady breeze led us to hope a good passage, which was realized; for on the 22nd July we reached Hood Island, the sloop arriving on the 26th.

“Whilst the schooner was loading the bales of orchilla, I daily visited the island; but I could not prepare any bird-skins for want of a suitable place for the operation, finding none either on land or on board; so, expecting to find the same species on the other islands, I confined myself to the study of the volcanic formations of the island, in collecting plants and such insects and animals as could be preserved in alcohol. I soon found my mistake in neglecting the birds; nor had I ever the opportunity of repairing my error.

“The species of birds I observed on Hood Island consisted of the two kinds of Hawk, the spotted as well as the dusky one (which Mr. Darwin considered to be individuals of different ages of the same species), the Dove (*Zenaida galapagensis*), and some of the smaller kinds of the genus *Geospiza*. But I saw no numbers of either *Camarhynchus* or *Cactornis*. There was a small Duck (*Dafila bahamensis*), an Owl (*Asio galapagensis*), and another night-bird larger than the *Asio*. The Thrushes on Hood Island were darker than those of the other islands, their bills longer and more curved, and their song of poorer quality. There was also a kind of yellowish Wren, less brilliant in tint than *Dendroeca aureola*, and without the rufous cap on the crown. Besides these there were 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.

“The flora of Hood Island is very variegated. It was only on this island that I found and collected the *Ipomœa habeliana*.

“At daybreak of the 27th we started for Charles Island (Floriana); and although the sloop left at midnight we overtook her by 10 A.M. We anchored about noon in the Puerto de las Cuevas, where we remained until the 3rd of August. As it was impossible to land without getting wet through by the surf, I only went on shore once, and then collected nothing but a few plants.

“The schooner having sailed with her cargo for Guayaquil, we started in the sloop on the 3rd August, and reached that part of the island called Black Beach the next day. Our craft was in most miserable condition: not only did she leak, but her pump was out of order, and she had to be baled out; the rudder, too, only hung by its lower hinge, a rope taking the place of the upper one. At Black Beach we took in some fresh meat, which a man, living on the island with a woman and another man, his assistant, supplied by shooting some of the wild cattle and swine. One day I visited the upper part of the island, where the penal colony which came to such a deplorable end formerly existed. After taking on board most of the labourers who had come from Hood Island from want of food, we left Charles Island on the 12th of August and sailed for Indefatigable, and anchored on the evening of 15th in the Puerto de la Aguada. After being fairly established I commenced to make my collection of birds.

“The most noticeable birds of this island which I did not collect were two species of Swallows. One, a large kind, kept to the perpendicular rocks which lined the estuary, and did not fly inland¹; the other, smaller, flew about the island, but too rapidly to be shot by me. I also observed a Bat, but was not fortunate enough to secure one.

“We left our anchorage on September 4th, and sailed east by north to another landing-place, which promised to yield ‘orchilla’ in greater abundance, as a branch of a tree brought from there was literally covered with it. On the 18th September we left again, keeping the same course, and encamped on that part of the island known as Puerto Garrapatero. It was here that I obtained the only specimen of *Geospiza strenua* I saw on Indefatigable. It is a little smaller than those obtained on Bindloe and Abingdon. It was also in this island that I saw four birds, about the size of Storks, pass high over head. Their wings were of a rosy colour, the breast white, and the body white and cream-coloured. The men collecting the ‘orchilla’ called them Flamingoes², saying that they frequented the higher portions of Indefatigable and Charles Islands.

“We remained in this port till October 8th, and then passed on to another landing-place till October 20th, and from there moved to the part of the island called Puerto de las Platanas.

¹ Probably *Progne concolor*.

² *Phœnicopterus ruber*.

“Mr. Rubira now arrived from Ballenita, where he had been to complete the purchase of a sloop he had bought of a man at the second landing-place, who was occupied in fishing; so we all embarked in her and sailed in the evening of the 23rd on a reconnoitring cruise. We sailed first for Tower Island, which we reached the next day. Landing Mr. Rubira and his partner, we proceeded to anchor in another place, and there remained till the next day. I felt sorry not to visit Tower Island myself, as I consider it one of the most interesting of the group as regards its ornithology. This island, being very rarely disturbed by vessels, has become the breeding-place of many sea-birds, for example, the Man-of-war bird¹ and others; and consequently many species are found here not to be seen on the other islands.

“The Gannet of Tower Island has red legs and feet², while the feet and legs of that on Hood and Charles Islands are blue, the body being white and the wings blackish grey. On Tower Island also a small species is found with chocolate-coloured plumage. Of this species a specimen was caught on board the sloop, and secured by tying it by the leg until I had an opportunity of dissecting it. But on Bindloe it was liberated by somebody, and so I lost the specimen. The most interesting bird I observed was one with white plumage all over, except the wings, which had black bands. Its long tail resembled that of a Macaw, but its body was smaller, its bill being straight and of a red colour³. I have no doubt that a thorough exploration of Tower Island would repay the explorer by the discovery of many species not to be found elsewhere.

“During the night of October 25th we sailed for Bindloe, which island we reached the next forenoon. After anchoring, a boat went off to search for a suitable place for encamping; we reached the one selected next morning. I did not go on shore till the day after, when every thing had been arranged in the tent. As the sloop was despatched on the 19th November to get a supply of terrapin and water, I went in her to visit other islands. We sailed first for Abingdon; but finding neither terrapins nor water, we made sail November 21st for Albemarle Island, where we arrived in the evening of the 23rd, and anchored in Tagus Cove. The next morning we went on shore—a rather perilous task, the surf being very high. Leaving one man to fill the casks with water, which in several places oozed out of the rocks near the sea, most of it being not sweet enough to drink, the rest of the party went off to look for terrapins. At the spring I saw a wild cat come down to drink; and the men told me there were many wild cats, dogs, and also asses on Albemarle. The two latter are also to be seen on Indefatigable and Chatham Islands, wild horses being also found on the last named. Of birds I observed two kinds of Hawks, *Dendroica aureola*, and some species of *Geospiza*, which appeared to differ from those I collected elsewhere, and which I consider to belong to species distinct from any in my collection. *Camarhynchus habeli* is also found on Albemarle, and also *Zenaida galapagensis*; but I saw no Mocking Thrushes.

“We left Albemarle on the last day of November for Bindloe, arriving at the northern

¹ *Fregata aquila*.

² Probably *Sula piscator*.

³ *Phaeton æthereus*.

end on December 6th. Here we had to anchor, being unable to reach our camp, owing to the strong current prevailing. The next forenoon, however, we made our destination.

“Great difficulty was experienced in embarking the labourers, the surf running very high—so much so that the canoe was repeatedly upset, and the few necessaries the men brought with them lost. The embarkation accomplished on December 9th, we sailed for Abingdon the following morning, and reached this island in five hours. Abingdon was the last island I visited, remaining there until the 1st January, 1869, on which day the sloop sailed with a cargo of ‘orchilla’ for Ballenita, and I left in her Abingdon Island and the whole of the group for good.

“During my stay I only found two birds’ nests; and I believe that the birds mostly retire into the more elevated, shady, and cooler parts of the interior of the islands to breed. One nest I found on Albemarle was shaped like a retort, and rested on the branch of a bush. The other, found on Bindloe, was shaped like a cradle, and was suspended from a branch.”

II. SHORT ACCOUNT OF THE LITERATURE RELATING TO THE BIRDS OF THE GALAPAGOS.

Prior to Mr. Darwin’s visit to the Galapagos, but little notice had been taken of the indigenous birds. Many of the writers who have left records of their visits to the islands have made incidental observations of the birds they saw: these relate chiefly to the sea-birds. They are so brief that it is only by the light of the positive knowledge we now possess of the birds that these incidental notices can be interpreted.

The literature of the ornithology of the Galapagos, therefore, may be said to have commenced with Mr. Darwin’s visit. During his celebrated voyage in H.M.S. ‘Beagle,’ thirty-four days were spent in the archipelago, the chief islands touched at being Chatham, Charles, Albemarle, and James. The birds collected by Mr. Darwin were briefly characterized by Mr. Gould in the ‘Proceedings’ of this Society for 1837, and were subsequently more fully described by Mr. Darwin himself in the third Part of the ‘Zoology of the Voyage of the Beagle.’ Unfortunately, at the time of his visit, Mr. Darwin did not fully appreciate the peculiar distribution of the bird-fauna throughout the different islands, and the particular island where each specimen was obtained was not always noted at the time. Enough, however, was recorded to form a basis for deductions, the importance of which in their bearing upon the study of natural science has never been equalled.

Subsequent observations tend to show that Mr. Darwin’s views as to the exceedingly restricted range of many of the species must be considerably modified. On the other hand, the exploration of more of the islands has led to the discovery of other and highly interesting species which there is every ground for supposing are not generally distributed over all the islands of the archipelago. Mr. Darwin records having obtained thirty-seven species of birds during his stay.

Subsequently to Mr. Darwin's expedition, the archipelago was visited by the French ship 'Vénus' in 1836-39; and a small collection of birds appears to have been made by the Surgeon Néboux. One of these was characterized by the late Baron de la Fresnaye as *Camarhynchus cinereus*, in the 'Magasin de Zoologie' for 1843. Others are described by Prince Bonaparte as *Zonotrichia galapagoensis* (Conspectus Avium, i. p. 479), and *Procellaria tethys* (Notes Ornithologiques, p. 92). The last named was probably obtained during the visit of the 'Vénus' to the islands; but the locality ascribed to the former I show elsewhere to be erroneous.

"Dr. Habel's visit was made in 1868. Though he touched at Hood, Albemarle, and Tower Islands, no birds were collected. From Indefatigable Island, however, a large and important series of birds was obtained; and more important still are his collections from the more northern outlying islands of Bindloe and Abingdon. Neither of the last-named islands had before or since been visited by any naturalist. A brief summary of Dr. Habel's collection, with descriptions of the new species, was drawn up by Mr. Sclater and myself, and published in the Society's 'Proceedings' for 1870. The same collections, with the addition of Dr. Habel's notes, now form the main source whence the present Memoir is derived.

Since our paper was published, the veteran ornithologist Sundevall has communicated to the 'Proceedings' of this Society for 1871 a list of the collection of birds made by the officers of the Swedish Frigate 'Eugenie' as long ago as 1852. Two new species are described in this paper; and some careful notes are added on several of the species mentioned. The islands explored were Charles Island, Chatham Island, and James Island, which were also touched at by the 'Beagle.' Indefatigable Island was also visited, where Dr. Habel collected largely. Albemarle Island is alluded to as having been called at; but no species of birds are mentioned in the list as having been obtained there.

These papers include all that has been especially written on the birds of the Galapagos Islands; but allusions to Mr. Darwin's visit have been frequently made, not only by Mr. Darwin himself in the narrative of his voyage as well as in others of his well-known works, but also by Sir Charles Lyell, in his 'Principles of Geology,' and by other writers.

The ground is classic ground; and the natural products of the Galapagos Islands will ever be appealed to by those occupied in investigating the complicated problems involved in the doctrine of the derivative origin of species.

III. LIST OF THE SPECIES OF BIRDS FOUND IN THE ARCHIPELAGO, AND REMARKS ON THEIR RELATIONSHIP TO THE BIRDS OF OTHER COUNTRIES.

[The specific names printed in italics indicate that the species occurs elsewhere than in the archipelago.]

	Chatham Island.	Charles Island.	Indefatigable Island.	James Island.	Bindloe Island.	Abingdon Island.	Albemarle Island.	
1. <i>Mimus</i> .								
1. <i>trifasciatus</i>		*						
2. <i>melanotis</i>	*	*	*	*				
3. <i>parvulus</i>							*	
2. <i>Dendroeca</i> .								
4. <i>aureola</i>	*	*	*	*	*	*		
3. <i>Progne</i> .								
5. <i>concolor</i>		*	?	*				
4. <i>Certhidea</i> .								
6. <i>olivacea</i>	*		*	*				
7. <i>fusca</i>					*	*		
5. <i>Geospiza</i> .								
8. <i>magnirostris</i>	*	*						
9. <i>strenua</i>	*		*	*	*	*		
10. <i>dubia</i>	*							
11. <i>fortis</i>	*	*	*	*	*	*		
12. <i>nebulosa</i>	*	*						
13. <i>fuliginosa</i>	*		*	*				
14. <i>parvula</i>	*			*	*	*		
15. <i>dentirostris</i>						*		Also on one of the islands visited by Mr. Darwin.
6. <i>Cactornis</i> .								
16. <i>scandens</i>		*	*	*				
17. <i>assimilis</i>					*			Also on one of the islands visited by Mr. Darwin.
18. <i>abingdoni</i>						*		
19. <i>pallida</i>			*					
7. <i>Camarhynchus</i> ¹ .								
20. <i>psittaculus</i>			*	*				
21. <i>crassirostris</i>		*?						
22. <i>variegatus</i>					*	*		
23. <i>prothemelas</i>	*	*	*	*				
24. <i>habeli</i>					*	*		Seen on Albemarle Island.
8. <i>Dolichonyx</i> ² .								
25. <i>orizivorus</i>				*				
9. <i>Pyrocephalus</i> .								
26. <i>nanus</i>			*	*	*			
10. <i>Myiarchus</i> .								
27. <i>magnirostris</i>	*		*	*	*	*		
11. <i>Asio</i> .								
28. <i>galapagensis</i>			*	*				
12. <i>Strix</i> .								
29. <i>punctatissima</i>			*	*		*		
13. <i>Buteo</i> .								
30. <i>galapagensis</i>			*	*		*		
14. <i>Pelecanus</i> .								
31. <i>fuscus</i>								[specified. Voyage of 'Eugenie,' but no island]

¹ *Camarhynchus cinereus* (Lafr.). This is apparently a distinct species; but as I have only seen the bad figure of it in the Mag. de Zool., I omit it from the present list.

² *Zonotrichia galapagensis*, Bp. The position of this species would be before *Dolichonyx*; but as I both doubt its distinctness from *Z. coronata* and also the origin of the specimen, I omit it from the list.

	Chatham Island.	Charles Island.	Indefatigable Island.	James Island.	Bindloe Island.	Abingdon Island.	Albemarle Island.	
15. <i>Sula</i> ¹ .								[specified.
32. <i>leucogastra</i>								Voyage of 'Eugenie,' but no island
33. <i>cyanops</i>								Do. Do.
16. <i>Fregata</i> .								
34. <i>aquila</i>								Tower Island (<i>Habel</i>), and voyage
17. <i>Phaeton</i>								of 'Eugenie.'
35. <i>æthereus</i>								Tower Island (<i>Habel</i>).
18. <i>Ardea</i> .								
36. <i>herodias</i>			*					Galapagos (<i>Darwin</i>).
19. <i>Butorides</i> .								
37. <i>plumbeus</i>			*	*				
20. <i>Nycticorax</i> .								
38. <i>pauper</i>			*					Galapagos (<i>Darwin, Sundevall</i>),
21. <i>Phœnicopterus</i> .								
39. <i>ruber</i>			*					Indefatigable Island (<i>Habel</i>), and
22. <i>Querquedula</i> .								voy. of 'Herald' and 'Pandora.'
40. <i>versicolor</i>								Voyage of 'Eugenie.'
23. <i>Dafila</i> .								
41. <i>bahamensis</i>			*					Galapagos (<i>Darwin</i>),
24. <i>Zenaida</i> .								
42. <i>galapagensis</i>			*	*	*			Observed on every island.
25. <i>Porzana</i> .								
43. <i>spilonota</i>			*	*				
26. <i>Ægialitis</i> .								
44. <i>semipalmata</i>			*					Galapagos (<i>Darwin</i>).
27. <i>Hæmatopus</i> .								
45. <i>palliatus</i>			*					Galapagos (<i>Sundevall</i>).
28. <i>Himantopus</i> .								
46. <i>nigricollis</i>			*					
29. <i>Strepsilas</i> .								
47. <i>interpres</i>			*		*			Galapagos (<i>Darwin</i>).
30. <i>Calidris</i> .								
48. <i>arenaria</i>					*			
31. <i>Heteroscelus</i> .								
49. <i>incanus</i>			*			*		Galapagos (<i>Darwin</i>).
32. <i>Tringa</i> .								
50. <i>minutilla</i>			*					Galapagos (<i>Darwin</i>),
33. <i>Numenius</i> .								
51. <i>hudsonicus</i>			*					
34. <i>Anous</i> .								
52. <i>stolidus</i>								Observed by Mr. Darwin, and voy.
35. <i>Larus</i> .								'Eugenie.'
53. <i>fuliginosus</i>		*	*			*		Galapagos (<i>Darwin</i>).
36. <i>Creagrus</i> .								
54. <i>furcatus</i>	*							
37. <i>Procellaria</i>								
55. <i>tethys</i>								Galapagos (<i>Nébow</i>).
38. <i>Œstrelata</i> ² .								
56. <i>phæopygia</i>	*							
39. <i>Spheniscus</i> .								
57. <i>mendiculus</i>				*				No doubt found on more islands.

¹ Dr. Habel describes a bird he saw on Tower Island, which, I think, may have been *S. piscatrix*. As no specimens were obtained, I refrain from including the species in the list.

² A Petrel described above by Dr. Habel may, I think, belong to a species distinct from this. He obtained no specimens.

Of these 57 species 19 only have as yet been found outside the limits of the archipelago, leaving 38 species peculiar to the islands, or more than 66 per cent.

Putting aside 21 of the 57 species, being the sea- or shore-birds, we have a remainder of 36 land-birds; of these 36 species only four, with our present knowledge, can be said to inhabit exclusively one island. These are *Mimus parvulus* of Albemarle Island, *Geospiza dubia* of Chatham Island, *Cactornis abingdoni* of Abingdon Island, and *Cactornis pallida* of Indefatigable Island. Very little can be said to be known of any of these four species; so that it is quite probable that they too may occur in other islands. It will be seen, then, that Mr. Darwin's remarks on the internal distribution of the birds of the archipelago require modification, and that certain species have not the exceedingly restricted range that he supposed.

With regard to the 19 widely ranging species, we see that 9 of them are solely American, the remainder being American also but at the same time more extensively distributed.

Distribution of the Genera of Birds found in the Galapagos.

1. <i>Mimus</i> . . . North and S. America.	21. <i>Phænicopterus</i> . Tropicopolitan.
2. <i>Dendræca</i> . . North and Central Ame- rica and West Indies.	22. <i>Querquedula</i> . Cosmopolitan.
3. <i>Progne</i> . . . North and S. America.	23. <i>Dafila</i> . . . Cosmopolitan.
4. <i>Certhidea</i> . . Galapagos.	24. <i>Zenaida</i> . . . South America.
5. <i>Geospiza</i> . . Galapagos.	25. <i>Porzana</i> . . . Cosmopolitan.
6. <i>Cactornis</i> . . Galapagos.	26. <i>Ægialitis</i> . . Cosmopolitan.
7. <i>Camarhynchus</i> . Galapagos.	27. <i>Hæmatopus</i> . . Cosmopolitan.
8. <i>Dolichonyx</i> . . North America.	28. <i>Himantopus</i> . . Cosmopolitan.
9. <i>Pyrocephalus</i> . South America.	29. <i>Strepsilas</i> . . Cosmopolitan.
10. <i>Myiarchus</i> . . North and S. America.	30. <i>Calidris</i> . . . Cosmopolitan.
11. <i>Asio</i> Cosmopolitan.	31. <i>Heterosceles</i> . . Shores of North and South Pacific Ocean.
12. <i>Strix</i> Cosmopolitan.	32. <i>Tringa</i> Cosmopolitan.
13. <i>Buteo</i> Cosmopolitan.	33. <i>Numenius</i> . . . Cosmopolitan.
14. <i>Pelecanus</i> . . Cosmopolitan.	34. <i>Anous</i> Tropicopolitan.
15. <i>Sula</i> Cosmopolitan.	35. <i>Larus</i> Cosmopolitan.
16. <i>Fregata</i> . . . Tropicopolitan.	36. <i>Creagrus</i> . . . Galapagos ¹ .
17. <i>Phaeton</i> . . . Tropicopolitan.	37. <i>Æstrelata</i> . . . Cosmopolitan.
18. <i>Ardea</i> Cosmopolitan.	38. <i>Procellaria</i> . . Cosmopolitan.
19. <i>Butorides</i> . . Tropicopolitan.	39. <i>Spheniscus</i> . . Antarctic Seas.
20. <i>Nycticorax</i> . . Cosmopolitan.	

It will be seen from this table that 27 out of the 39 genera of birds represented in the Galapagos Islands are of very wide distribution. Of the remaining 12, 7 are found in continental America, leaving 5 peculiar to the islands. It is the presence of these 7 genera therefore that demonstrate, beyond all doubt, the zoological affinity of these islands to the American continent, so far as the class *Aves* is concerned.

¹ Perhaps also California.

Families of Birds represented in the Galapagos, with their Distribution.

- | | | |
|-----------------|---------------------|--------------------|
| 1. Turdidæ. | 8. Strigidæ. | 15. Rallidæ. |
| 2. Mniotiltidæ. | 9. Falconidæ. | 16. Charadriidæ. |
| 3. Hirundinidæ. | 10. Pelecanidæ. | 17. Scolopacidæ. |
| 4. Cœrebidæ. | 11. Ardeidæ. | 18. Laridæ. |
| 5. Fringillidæ. | 12. Phœnicopteridæ. | 19. Procellariidæ. |
| 6. Icteridæ. | 13. Anatidæ. | 20. Spheniscidæ. |
| 7. Tyrannidæ. | 14. Columbidaæ. | |

Of these twenty families all but five are nearly universally distributed over the globe. Of the remainder, four, viz. Mniotiltidæ, Cœrebidæ, Icteridæ, and Tyrannidæ, are peculiar to the continent of North and South America, whilst the fifth, Spheniscidæ, is a product of the Antarctic seas.

IV. SUMMARY OF THE BIRDS FOUND IN EACH ISLAND.

Chatham Island.—Visited by Mr. Darwin and the officers of the 'Eugenie.' The common *Mimus melanotis* occurs here, as well as *Dendræca aureola*. The peculiar genus *Certhidea* is represented by *C. olivacea*. Of *Geospiza* no less than seven species occur, in fact all the so-called species, except *G. dentirostris*, which may, and probably is, also found there, since Mr. Darwin's specimens have no locality recorded. *Cactornis* has not yet been detected; and of *Camarhynchus*, only *C. prothemelas*. The widely ranging *Myiarchus magnirostris* completes the twelve species which are all that have as yet been noticed on Chatham Island. It probably harbours its share of some twenty other species, of which only a general range is given.

Charles Island.—Visited by Mr. Darwin and the officers of the 'Eugenie.' Two species of *Mimus* are found here—*M. trifasciatus* and, according to Sundevall, *M. melanotis*, the latter also ranging through several other islands. *Dendræca aureola* is mentioned by Darwin as occurring throughout the islands; but no particular island is specified. Professor Sundevall, however, names Charles Island as one on which specimens were obtained by the officers of the Swedish vessel. *Progne concolor* was obtained by Néboux. Of *Geospiza* three species have been noticed—*G. magnirostris*, of which Mr. Darwin is the only naturalist who has obtained specimens, *G. fortis*, the most widely ranging species of the genus, and *G. nebulosa*. Of *Cactornis* only the common *C. scandens* has been noticed. *Camarhynchus* is represented by two species, one, however, doubtfully *C. crassirostris*. The other, *C. prothemelas*, is found in several other islands. The only other species noticed in Charles Island is *Larus fuliginosus*, though several others may have been obtained there whose precise origin was not recorded by the collector.

James Island.—Visited by Mr. Darwin and the officers of the 'Eugenie.' *Mimus melanotis* is the Mocking-bird of this island, where *Dendræca aureola* is also found. It and Charles Island are the sole recorded localities for *Progne concolor*. *Certhidea oli-*

vacea occurs, and four species of *Geospiza*. *Cactornis scandens* and two species of *Camarhynchus* (*C. psittaculus* and *C. prothemelas*) make up a total of seven species of Finches. The two Tyrannidæ (*Pyrocephalus nanus* and *Myiarchus magnirostris*) are also met with, as well as the two Owls (*Asio galapagensis* and *Strix punctatissima*). *Butorides plumbeus* is found here, also the Pigeon (*Zenaida galapagensis*). Here, too, *Spheniscus mendiculus* occurs.

Indefatigable Island.—Visited by Dr. Habel and the officers of the 'Eugenie.' Dr. Habel obtained no less than 267 skins on this island, being more than half his whole collection. *Mimus melanotis* is the Mocking-bird of Indefatigable, as it is of Chatham and James. *Dendræca aureola* occurs in abundance; *Certhidea olivacea* would also appear to be a common bird. Of Finches we find four species of *Geospiza*, *Cactornis scandens*, *Camarhynchus psittaculus*, and *C. prothemelas*. Both the Tyrants (*Pyrocephalus nanus* and *Myiarchus magnirostris*), both Owls (*Asio galapagensis* and *Strix punctatissima*), also *Buteo galapagensis*. Three species of Heron (*Ardea herodias*, *Butorides plumbea*, and *Nycticorax pauper*), *Dafila bahamensis*, the Pigeon (*Zenaida galapagensis*), and the small Crake (*Porzana spilonota*). All the Limicolæ (Plovers and Sandpipers) that have been noticed in the archipelago are recorded by Dr. Habel as occurring here; he also found *Larus fuliginosus*. Altogether twenty-nine species have been obtained in Indefatigable Island; but this large number compared with those recorded in other islands is doubtless mainly due to Dr. Habel having noted the localities on all, or nearly all, his specimens.

Albemarle Island.—Visited by Mr. Darwin and the officers of the 'Eugenie.' Though the largest island of the whole archipelago, but one species (*Mimus parvulus*) has as yet been assigned to it; this was obtained by Mr. Darwin. Professor Sundevall includes this island in his list of those visited by the 'Eugenie;' but no specimens appear to have been collected; at least none are recorded in Sundevall's list.

Bindloe Island.—Visited by Dr. Habel. Bindloe Island does not seem to possess a Mocking-bird; but *Dendræca aureola* occurs. Its *Certhidea* (*C. fusca*), which it shares with its neighbour Abingdon Island, seems to replace the *C. olivacea* of the other islands. Three *Geospizæ* are found. Its *Cactornis* is *C. assimilis*, which was also found on one or other of the islands visited by Mr. Darwin. With Abingdon it has two peculiar species of *Camarhynchus* (*C. habeli* and *C. variegatus*). *Pyrocephalus nanus* and *Myiarchus magnirostris* are both found, and also the Pigeon (*Zenaida galapagensis*). The widely ranging *Streptopelia interpres* and *Calidris arenaria* make up a total of 13 species, of which Dr. Habel collected 94 skins.

Abingdon Island.—Visited by Dr. Habel. Mocking-birds are also absent from Abingdon Island, but not *Dendræca aureola*. *Certhidea fusca* occurs, as well as on Bindloe Island. Four species of *Geospiza* (including *G. dentirostris*) are found, and a peculiar *Cactornis* (*C. abingdoni*). *Camarhynchus* is represented by *C. habeli* and *C. variegatus*. *Myiarchus magnirostris*, *Strix punctatissima*, and the Buzzard (*Buteo*

galapagensis) occur. The wide-ranging *Heterosceles incanus* appears here, and, lastly, *Larus fuliginosus*. The number of species obtained by Dr. Habel in Abingdon Island was 14, of which he made 84 skins.

The following islands remain as yet unexplored:—

Albemarle Island.—Though in area this island is perhaps as large as all the rest put together, we know positively of only one species of bird having been observed there, viz. *Mimus parvulus*. The northern part of the island is very sterile, and probably does not support many land-birds; but the south-eastern end is described as thickly wooded and very green. Colnett (p. 144) speaks of having seen Storm-Petrels in great numbers between Albemarle and Narborough. Captain Porter landed near Point Essex, and says he saw plenty of birds called “Shags,” and other sea-birds; and between Point Essex and Point Christopher the rocks were everywhere covered with Seals, Penguins, “guanans,” and Pelecanus. Captain Porter subsequently visited a spot which, from his description, appears to be Tagus Cove; here, he says, he saw a “variety of birds.”

Narborough Island.—No birds are recorded from this island; and, considering its extreme barrenness, it is quite possible that no land-birds exist upon it.

Hood Island.—Captain Porter incidentally remarks (p. 233) that there are few birds on this island, but that they are of the same description as those found on the others.

Tower Island.—Except Dr. Habel's brief notes, no account has been given of the birds of this island. It is said to be low and different from the other islands of the archipelago.

Barrington Island, Duncan Island, Jervis Island.—These small islands have not yet been visited by any collector. They are all situated in the central part of the archipelago. Barrington is described as rather woody, Duncan as barren on all sides, while Jervis is a convenient anchorage from which to visit the south side of James Island.

Wenman Island and Culpepper Island.—These two small islands are both described as barren. Sea-birds resort to them; but land-birds have not been reported. Captain Porter saw abundance of Man-of-War Hawks (*Fregata*), Gannets, and Gulls near Wenman Island. He also saw “Black Petrels,” probably *Procellaria tethys*.

It will thus be seen that, so far as the ornithology of the Galapagos is concerned, Albemarle Island offers the best prospect of additional discoveries to a future explorer. The south-western part is the best worth working, being more wooded; but Tagus Cove and Banks's Bay should also be visited. The descriptions of Narborough are such as to preclude the likelihood of any land-birds being found on it; still it should not be altogether passed by. Hood Island offers a fresh field for investigation; and as it maintains a peculiar species of tortoise, peculiar land-birds may still be forthcoming. Still greater prospect of novelty is held out by the investigation of Tower Island, which, though small, is so situated as to be considerably detached from the rest of the archipelago. Barrington Island should not be overlooked, though the prospect of any species different from those found on Indefatigable is small. Duncan Island and

Jervis Island should also be visited, though they are little else but outlying rocks of the larger islands, James and Indefatigable.

Lastly, of unvisited islands there remain Wenman and Culpepper. The chance of finding any land-birds on either of these rocks is exceedingly small; but the fact of their non-existence should be ascertained.

All the islands that have already been investigated are worthy of further exploration. The species of *Mimus* require more working out. Several of the so-called species of *Geospiza* are but little known, such as *G. magnirostris*, *G. nebulosa*, and *G. dubia*; also more specimens of *Cactornis assimilis*, *C. abingdoni*, and *C. pallida* are required to complete our knowledge of these birds.

Camarhynchus psittaculus and *C. crassirostris* are but little known, and still less the bird described by Lafresnaye as *C. cinereus*. The two Herons (*Butorides plumbea* and *Nycticorax pauper*) are as yet only known from immature birds; more specimens of the Flamingo would be useful, and a good series of the Petrels. Lastly, and most important of all, a series of observations are required upon the attitude the different species of *Geospiza* maintain towards one another, tending to show how far the differences observable, or thought to be observable, in dried specimens indicate the actual grouping in species of living individuals.

From these remarks it will be seen that much useful work remains to be done in these islands in the birds alone. In other branches of biological science even more investigation is required.

V. ON THE VARIATION OF THE SPECIES IN CERTAIN GENERA, AND THE CONSEQUENT DIFFICULTY IN DEFINING SPECIFIC LIMITS.

The acquisition of a large series of specimens of the different so-called species of *Geospiza* renders the question as to the definiteness of the points of specific distinction between them more difficult of solution than ever. Distinctions are plainly enough to be seen between such birds as *G. magnirostris* and *G. parvula*, where great disparity in size is obvious. But these differences are gradually erased by almost insensible steps by the interposition of *G. strenua*, *G. fortis*, and *G. fuliginosa*. The series before me includes specimens that can almost as well be referred to either of two contiguous species, so that their position can only be determined by assigning to each species what must be called arbitrary standards of measurements of the bill alone. The question follows, Do these birds, in their natural relations to one another, keep themselves to groups of individuals dependent upon the size of their bills? The answer is to be found rather by field-observation than by measuring skins. Were different species, though closely allied, found to inhabit different islands, the case would be much simplified. But what do we find? Charles Island possesses three out of eight so-called species, Chatham Island has no less than seven, James Island four, Indefati-

gable Island three, Bindloe three, and Abingdon four. Thus we see that in Chatham Island every gradation in size is represented.

Then as to coloration. The assumption of the black plumage by the old males seems to be a slow process, the fully black feathering being only arrived at in probably the third year; and it is probable, from the comparatively scanty numbers of the black individuals, that the cock birds breed in the mottled plumage long before the fully black dress is assumed. Observations on paired and nesting birds would here be invaluable.

It would seem, then, that with these singular birds the sexual selection displayed amongst them is such that it is almost a matter of indifference whether the cock birds are mottled or black, and also that the nature of their food and the general conditions of life are such that birds with huge bills as large as a Grosbeak's, as well as those with bills no bigger than a Bunting's, can equally find sustenance, variation as regards the length of wing, tail, and tarsi being equally unimportant. The members of this genus present a field where natural selection has acted with far less rigidity than is usually observable.

The gap between *Geospiza* and *Cactornis* is fairly defined—not but what we see in some specimens of the former more elongated bills than in others, showing a tendency in *Geospiza* to develop in the direction of *Cactornis*. But it would seem that the connecting links are gone; hence our ability to define the differences between these genera.

Camarhynchus belongs to a somewhat different type; and I am inclined to believe that it is not to be traced to the same origin as *Geospiza* and *Cactornis*, but to a common ancestor with, perhaps, *Spermophila*, the bill of the somewhat abnormally of that genus (*Neorhynchus nasesus*) recalling to some extent the peculiarities of the bill of *Camarhynchus*. So much for structural characters. In coloration *Camarhynchus* resembles both *Geospiza* and *Cactornis*; but the males of none of the species are so black as those of the adults of the other genera.

It seems worthy of notice that, though the different species of Finches are not restricted to any one particular island, there appears to be a prevalence of some one species in each. Dr. Habel's collection shows that in Indefatigable Island two dominant species occur—*Geospiza fortis* and *G. fuliginosa*. In Bindloe Island *G. strenua* abounds, whilst in Abingdon we find *G. parvula*. It may thus be argued that the tendency of each of these islands is to produce the form most prevalent in it; but, on the other hand, I am not able to say what attention Dr. Habel devoted to each species.

VI. ACCOUNT OF EACH SPECIES.

Genus MIMUS.

Mimus is a purely American genus of the family Turdidæ, the species composing it being very widely distributed over both the northern and southern continents as well as some of the West-Indian islands. The three closely allied species found in the Galapagos Islands have their nearest continental ally in *Mimus longicaudus*, a species found in Western Peru, and belonging to a section of the genus only found in the Neotropical Region. There can be no question that *Mimus trifasciatus* and its insular allies are strictly congeneric with the continental birds.

MIMUS TRIFASCIATUS.

Orpheus trifasciatus, Gould, P. Z. S. 1837, p. 27.

Mimus trifasciatus, G. R. Gray, Zool. Voy. Beagle, iii. p. 62, t. xvi.; Sundev. P. Z. S. 1871, p. 127.

Supra obscure fuscus, pileo saturatiore, uropygio pallidiore: secundariis et alarum tectricibus albo terminatis: loris nigris albo supra marginatis, regionibus parotica et auriculari albis, plumis infra oculos nigro variegatis: subtus albus, pectore distincte fusco-nigro notato, hypochondriis nigro maculatis: rectricum trium externarum apicibus fusco-albido indistincte notatis: long. tota (circ.) 10·5, alæ 4·9, caudæ 4·4, tarsi 1·7, rostri a rictu 1·45 poll. angl.: rostro et pedibus obscure corylinis, mandibulæ basi pallido.

Hab. Charles Island (*Darwin*).

MIMUS MELANOTIS.

Orpheus melanotis, Gould, P. Z. S. 1837, p. 27.

Mimus melanotis, G. R. Gray, Zool. Voy. Beagle, iii. p. 62, t. xvii.; Sel. & Salv. P. Z. S. 1870, p. 323; Sundev. P. Z. S. 1871, pp. 124, 126.

♂ supra obscure fusco-brunneus plumis singulis pallidiore marginatis, uropygio pallidiore, pileo nigricantiore: primariis et secundariis albido stricte marginatis: tectricibus alarum majoribus albo terminatis fascias duas formantibus, minoribus quoque albo terminatis: superciliis et corpore subtus albis: loris et regione auriculari nigris: hypochondriis maculis fuscis punctatis: cauda fusco-nigra, rectricibus tribus utrinque externis albo gradatim terminatis: iride (ave viva) luteo: pedibus nigricantibus: rostro nigro: long. tota $9\frac{3}{8}$, alæ $4\frac{1}{2}$, caudæ 4·3, tarsi 1·4, rostri a rictu 1·1.

(♂ ad. ex ins. Indefatigable, 20th September, 1868.)

Hab. Chatham Island (*Darwin, Sundevall*); Charles Island (*Sundevall*); James Island (*Darwin, Sundevall*); Indefatigable Island (*Habel, Sundevall*).

Other notes on a fresh specimen taken by Dr. Habel are:—"Expanded wings from tip to tip $13\frac{1}{4}$ inches, inside of mouth flesh-colour, and contents of the stomach insects."

"From the observations I made on the Mocking-birds of the different islands of the

Galapagos archipelago I am inclined to think that Hood's Island is occupied by a species distinct from any yet described.

“Hood's was the first island of the archipelago that we landed upon; and I observed that the Mocking-bird was different from the common one of the mainland of Ecuador. In the latter country these Thrushes are great favourites with the natives, and I have seen birds reared in large open cages hanging in the garden enjoy full liberty, flying about during the day and being shut up only at night to protect them from being attacked by cats or other animals. It struck me that the beaks of the birds on Hood's Island were larger and more curved, that the birds were more sluggish in their habits, and their voices less melodious than those inhabiting the mainland. Unfortunately I neglected to collect specimens on Hood's Island, thinking I should meet with the species elsewhere, and that I should return to Hood's Island for a longer stay. On reaching Charles Island I found out my mistake, and that the Mocking Thrushes there differed in their livelier and more intelligent habits, and in their superior powers of song.

“The habits of the Mocking Thrushes of the archipelago are rather predatory. These birds devour insects of various kinds, grasshoppers, and butterflies, which they follow for a long distance, and catch on the wing. This may be the reason why insects of all kinds are so shy throughout the archipelago, whilst all other animals are tame. They readily consume any kind of flesh, whether fresh or putrefying. They are not only tame but bold and audacious. Many times birds have settled on my hat or gun, or keeping near me have driven away smaller birds I was in pursuit of. The birds of Indefatigable Island are excellent songsters; and their varied notes often led me to believe that I was listening to some unknown species of bird.”—*H.*

MIMUS PARVULUS.

Orpheus parvulus, Gould, P. Z. S. 1837, p. 27.

Mimus parvulus, G. R. Gray, Zool. Voy. Beagle, iii. p. 63, t. xviii.; Sundev. P. Z. S. 1871, p. 127.

Supra obscure fuscus uropygio paulo rufescentiore: loris, regione parotica et tectricibus auricularibus nigris: secundariis stricte, et tectricibus alarum albo terminatis: subtus albus, hypochondriis fusco maculatis: rostro et pedibus obscure corylinis, illo ad basin mandibulæ macula pallida notato: long. tota 8·2, alæ 3·8, caudæ 3·5, tarsi 1·3, rostri a rictu 0·95.

Hab. Albemarle Island (*Darwin*).

Professor Sundevall suggests that *M. parvulus* is perhaps the young of *M. melanotis*, and that *M. trifasciatus* was described from a very old specimen, being unwilling to admit that three closely allied forms inhabit islands so near together. I have examined carefully Mr. Darwin's types in the British Museum; and the conclusion I have come to is that

M. trifasciatus is a species very distinct from the other two, the chief points of dif-

ference being its larger size, its having the chest marked with dark brown instead of being white, and in the white terminations to the wing-coverts and secondaries being more conspicuous.

M. parvulus is very closely related to *M. melanotis*; and I am inclined to believe that a larger series of specimens would show that the differences (in size alone) would gradually disappear. It must be observed that the specimen of the small bird (*M. parvulus*) came from the sterile part of Albemarle Island (probably Tagus Cove), and hence may represent a small starved race of the more robust *M. melanotis*.

Genus DENDRÆCA.

The species of this somewhat varied genus, so far as coloration is concerned, found in the Galapagos Islands belongs to the rather restricted section which is best known by the common *Dendræca æstiva* of North America. This last-named bird is extremely abundant, and migrates from the northern continent in autumn to spend its winter in Central America and the northern provinces of South America. Other members of this section are found stationary in Central America and the West-Indian Islands. Closely allied races are to be found in Cuba, Jamaica, the Virgin Islands, and Barbadoes. The Central-American bird is rather more distinctly differentiated, being itself divisible into two very closely related races. Mr. Ridgway, the most recent writer on this genus, gives the following as the species and varieties of this section of the genus:—

DENDRÆCA ÆSTIVA. Entire continent of North America, migrating in winter to Central and South America as far as New Granada.

DENDRÆCA PETECHIA. West Indies, except Trinidad and Barbadoes.

Var. *gundlachi*. Cuba and the Bahamas.

Var. *petechia*. Jamaica and Haiti.

Var. *ruficapilla*. Porto Rico, St. Thomas, St. Croix, and St. Bartholomew.

DENDRÆCA AUREOLA. Galapagos Islands.

DENDRÆCA CAPITALIS. Barbadoes.

DENDRÆCA VIEILLOTI. Central America and New Granada.

Var. *vieilloti*. New Granada.

Var. *rufigula*. Isthmus of Panama.

Var. *bryanti*. Honduras and Yucatan to Mazatlan.

As it is very difficult to distinguish specifically between fully adult birds from the Galapagos Islands and Jamaica, the generic affinities between *D. aureola* and other members of *Dendræca* are complete.

DENDRÆCA AUREOLA.

Sylvicola aureola, Gould, Zool. Voy. Beagle, iii. p. 86, t. xvii.

Dendræca aureola, Baird, Rev. Am. B. i. p. 194 (note); Ridgw. N.-Am. Birds, i. p. 217.

Dendræca petechia, var., Sundev. P. Z. S. 1871, p. 124.

Mniotilta d'été, Prév. et Des Murs, Voy. Vénus, v. p. 197.

♂ *ad.* supra olivaceus: pileo antico castaneo: alis et cauda fusco-nigris extus olivaceo marginatis; tectricibus alarum conspicue luteo marginatis: rectricibus, nisi duabus mediis, in pogonio interno luteis, apicibus fuscis: subtus flavus, pectore et hypochondriis maculis elongatis castaneis notatis.

♂ *jun.* supra olivaceus, pileo antico concolori: alis et cauda fuscis plumarum marginibus dorso concoloribus: subtus sordide luteus, maculis castaneis adulti carens.

♀ *ad.* supra cinereo-olivacea, tectricibus alarum sordide albo marginatis: subtus alba vix luteo tincta: iride brunnea.

	Long. tot.	Alæ.	Caudæ.	Tarsi.	Rostris a rict.
♂ <i>ad.</i> . . .	5.0	2.65	2.1	0.85	0.65
♂ <i>jun.</i> . . .	4.75	2.5	1.9	0.8	0.6
♀ <i>ad.</i> . . .	5.0	2.5	1.9	0.82	0.6

Hab. Galapagos generally (*Darwin*); Chatham Island, Charles Island, James Island (*Sundevall*); Indefatigable Island, Bindloe Island, Abingdon Island (*Habel*); Galapagos (*Néboux*).

Of this form of *Dendræca æstiva* Dr. Habel has collected a large series of specimens of different ages and of both sexes. Fifty-four are from Indefatigable, two from Bindloe, and seven from Abingdon. Mr. Darwin does not particularize the islands on which he met with it, but says that it is "not uncommon on the islands." We may therefore assume that it is generally distributed over the group.

Professor Baird, in his 'Review of American Birds,' has given a careful résumé of the differences which may be detected in the various local forms of *D. æstiva*. With the present form he was only acquainted from the figure and description in the 'Voyage of the Beagle,' and says of it that it "appears to resemble *D. petechia* in coloration, but to differ in fewer and lesser stripes beneath, in the grey of the head, and the lightness of the abdomen." The original specimen thus spoken of appears not to have been quite adult; for in the full-plumaged birds of *D. aureola* the differences alluded to entirely vanish, and the general plumage becomes as nearly as possible that of *D. petechia*. The only differences I can detect are:—(1) the general size of *D. aureola* is slightly larger; (2) the second, third, and fourth primaries in most specimens of *D. aureola* are nearly equal, in *D. petechia* the second is generally rather shorter than the two following. But I do not believe that it would be always possible to separate a series of specimens of these two forms if mixed together.

Under these circumstances, regarding the two forms as virtually identical, we have the following singular state of affairs. The bird from the Galapagos is the same as that from Jamaica, whereas on the intervening continent two other (so-called) species occur—namely, *D. æstiva* as a winter migrant, and *D. vieillotii* as a resident—but never, as far as we know, *D. petechia*.

"During my stay in the archipelago I was strongly disposed to believe that the spe-

cimens I collected of this bird belonged to at least two, if not three, distinct species. I was led to this belief by the diversity of size, though of small extent, in my specimens; but more notable still were the three distinct styles of colour of their plumage, their different habits, and a difference in their song. I collected both sexes of these supposed species, and found differences, with the sole exception that the females of the yellow species were exactly like those of the spotted kind. The smallest species, with a greyish green plumage and whitish breast, frequented exclusively the lower bushes on the dry land away from the sea-coast, and in its flight would rise just enough to clear the bush it rose from, and alight immediately on the next adjoining. I never saw it in company with the two other species. It does not sing, but merely utters a chirping note. The two other species are of the same size, and differ only in the colour of their plumage. The breast and head of one species is of a uniformly bright yellow colour; the breast of the other is spotted, and it bears on its head a reddish chestnut cap. Both these varieties mingle together and associate in small flocks of five or six birds. I never observed one of the plain variety without seeing some of the spotted kind with it. The first specimen of the yellow variety I secured was in such company; and I considered it to be the female of the spotted one, especially as its cries when wounded were answered by a spotted male which approached me. However, on dissecting the specimen, I found, to my surprise, that it was a male. Both these varieties frequent trees ('palo salado' of the natives of the mainland) growing on the sea-shore or the lagoons formed by the spring tides, the roots of which are washed by the sea-water at each tide. In their lively movements from branch to branch in search of insects they chant a pleasant tune. The males also sing when flying, as they do rapidly, from shore landward, or *vice versá*, never remaining long in one locality.

"If all the specimens of these three varieties are but the individuals of one species in different stages of dress, it would show that the plumage of the young is distinct from that of the adult, and that two changes are undergone before maturity is attained. A similar feature is seen in the case of *Geospiza*, to which I allude below.

"On Hood's Island, where we first touched, the gentleman in whose company I visited the Galapagos archipelago and I observed some birds which seemed to us to belong to a species or variety distinct from the present bird. Their yellow plumage was of a less brilliant colour; and they did not possess the characteristic reddish chestnut cap."—*H.*

I have no doubt that there is but one species of this bird, and that the apparent differences noticed by Dr. Habel are to be attributed to different stages of plumage. Those as described above are the young birds in their earliest dress, the adult females (through which stage the maturing males pass), and the adult males.

Genus PROGNE.

A purely American genus of Hirundinidæ, one (or two members, recognizing Professor Baird's *P. cryptoleuca*) of which belong to North America, the rest being restricted to the Neotropical Region. The species inhabiting Central America and the northern portions of South America is *P. chalybea*, in which the abdomen in both sexes is white, as is the case in the Antillean *P. dominicensis*. The present bird, in its whole-coloured plumage, resembles *P. purpurea* of North America—a species which ranges into Brazil, but keeps always to the east coast of the southern continent.

PROGNE CONCOLOR.

Hirundo concolor, Gould, P. Z. S. 1837, p. 22.

Progne concolor, Baird, Rev. Am. B. p. 278.

Progne modesta, Voy. Beagle, iii. p. 39, t. 5; Prév. et Des Murs, Voy. Vénus, v. p. 182.

Hirundo modesta, Néboux, Rev. Zool. 1840, p. 291; Sundev. P. Z. S. 1871, p. 125.

Nitide purpurascens unicolor, alis et cauda obscurioribus: long. tota 6·6, alæ 5, caudæ rectr. ext. 2·5, rectr. med. 1·9, tarsi 0·5, rostri a rictu 0·75.

Hab. James Island (*Darwin, Sundevall*); Charles Island (*Néboux*).

Dr. Habel did not secure specimens of this Swallow, but appears to have seen it on Indefatigable Island. It has hitherto only been obtained on James Island and Charles Island.

Genus CERTHIDEA.

This genus was placed by Mr. Gould in the family Fringillidæ, and in his opinion represented the extreme form of the group characterized by *Geospiza*. After a close examination Mr. Sclater and I convinced ourselves (Nomencl. Av. Neotr. p. 16) that this somewhat singular form was best placed near the genus *Conirostrum*, and in the Cœrebidæ, the attenuated and sharply pointed bill suggesting forcibly an affinity with that genus and family. From *Conirostrum* *Certhidea* differs in having much shorter wings and tail; but in the form of the nostril, the scutellation of the tarsi, and in the proportionate length of the toes it agrees closely with that genus.

The genus *Conirostrum* contains six species, all of which are restricted in their range to the Andes, and are found at a considerable elevation from Columbia to Bolivia, never descending into the hot lowlands.

CERTHIDEA OLIVACEA.

Certhidea olivacea, Gould, P. Z. S. 1837, p. 7; Darwin, Zool. Voy. Beagle, iii. p. 106, t. xlv.; Scl. & Salv. P. Z. S. 1870, p. 323.

♂ (Indefatigable Island) supra fusco-olivaceus, alis et cauda paulo obscurioribus, illarum tectricibus fusco-albido marginatis: subtus ochrascenti-fuscus: abdomine

dilutior: rostri maxilla brunnea: mandibula albida: pedibus flavicanti griseis: long. tota 3.85, alæ 2, caudæ 1.5, tarsi .8.

♀ mari similis, sed paulo ochrascescentius tincta.

Hab. Chatham Island, James Island (*Darwin*); Indefatigable Island (*Habel*).

Dr. Habel gives the measurement of the outstretched wings of this species as $6\frac{3}{4}$ inches. He adds the following note:—"This species lives exclusively on insects, which it hunts through the thickest bushes in flocks, warbling its not unpleasing notes. It wanders from bush to bush by a short, low flight. The density of the thickets often renders it a difficult bird to secure."—*H.*

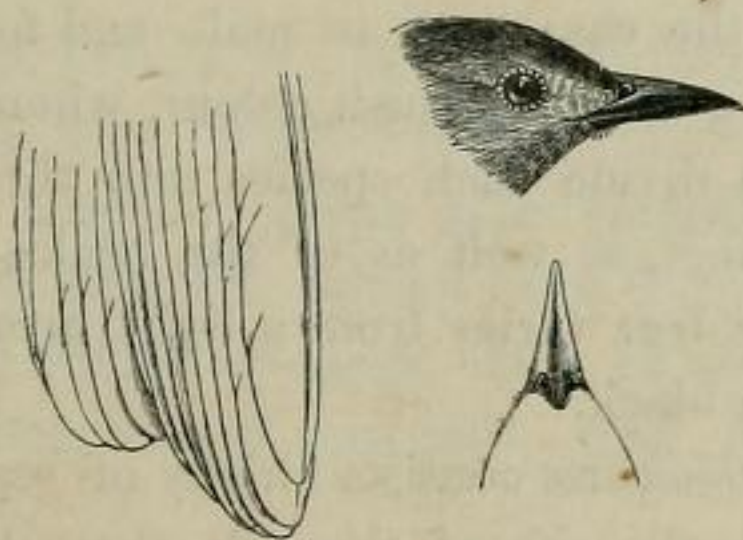
CERTHIDEA FUSCA.

Certhidea fusca, Scl. & Salv. 1870, p. 324.

Supra fusca, subtus grisescenti-albida: subalaribus et remigum marginibus internis albis: rostro et pedibus nigris: long. tota 3.7, alæ 2.0, caudæ 1.5, rostri a rictu 0.5, tarsi 0.8.

Obs. Præcedenti similis sed rostro graciliore, colore, sicut pedum, nigro et veste magis fusca distinguenda.

Hab. Bindloe and Abingdon Islands (*Habel*).



Certhidea fusca.

"The morning after I landed on Abingdon Island I was pleasantly surprised on hearing a melodious song near the tent which I had never heard before in other islands of the archipelago, and which reminded me of the notes of a Central-American Wren. Hurrying out of the tent to look for the songster, I could hardly believe my eyes when I saw this bird, expecting to find a Wren. Only by repeated observations could I convince myself that it really was the owner of so sweet a voice.

"Its habits only differ from those of the preceding species inasmuch as it is found in smaller flocks. These keep flying from bush to bush, which on the arid volcanic soil of Bindloe and Abingdon Islands grow less densely and are more isolated. *Certhidea fusca* lives entirely on insects."—*H.*

Genus GEOSPIZA.

This genus has been placed by Gray near *Coccothraustes*; but full regard being taken of the strongly angulated tomia of the upper and lower jaw, I think it will be seen that this is not its right position. In the formation of its bill it hardly differs at all from some species of *Guiraca*, such as *G. concreta* and its allies. The legs and feet, however, are much longer and stronger than in any species of *Guiraca*; and the tail, in proportion to the wings, is very short. The general coloration too is quite different. I feel satisfied, however, that, *Geospiza* has its nearest continental ally in *Guiraca*.

The different states of plumage, on which Dr. Habel remarks below, are to be attributed to the different ages of individuals. The younger birds are the lightest-coloured and present the most mottled appearance; as they get older they become darker, until at last in old males the plumage is almost uniform black. The colour of the bill appears to vary irrespective of age, as some black birds have light-coloured bills, though in the majority of birds in this dress it is black. Younger mottled birds have light-coloured bills, but in old females, just as in the males, the bill is usually black.

Dr. Habel has supplied me with the following general remarks on the birds of this genus:—

“The colouring of all the species of this genus exhibits three styles—a black, a brown, and a grey. This is the case both in male and female birds, except that the plumage of the females is of a dirty brownish colour, whereas in the males it is black. It would seem reasonable to divide each species into three varieties, as besides the plumage the colour of the feet, as well as of the beaks, is different in these three varieties. The colour of the feet varies from a light grey to black, and that of the beak from yellow to brownish black.

“Though the food of the *Geospizæ* consists chiefly of seeds of plants and trees, they also feed on insects. During the ebb of the tide these birds, especially the smaller species, visit the bare places, where they pick up different plants and animals of the sea from amongst the stones. The reason for their resorting to such localities for food is perhaps to be found in the scarcity of water more or less experienced by birds on these islands. On the Island of Abingdon, where no pools of water exist, the birds are dependent for water on the morning dew and the water condensed from the steam which issues from the crevices of the volcanic rocks. The feathers of the faces of these birds are often smeared with the gummy substance formed by the juice of the *Opuntia*, which stands to them in the place of water.”—*H.*

GEOSPIZA MAGNIROSTRIS.

Geospiza magnirostris, Gould, P. Z. S. 1837, p. 5; Darwin, Zool. Beagle, iii. p. 100, t. xxxvi.

♂ fuliginoso-niger, crisso albo nigro variegato: rostri maxilla nigra: mandibula flavo variegata: long. tota (cir.) 6·0, alæ 3·5, caudæ 2·0, tarsi 1·05, rostri a rictu 0·9.

♂ *juv.* fusco-niger, dorsi, gulæ et pectoris plumis pallide fusco marginatis, abdomine fere fusco unicolori: long. tot. cir. 5·7, alæ 3·3, caudæ 2·0, tarsi 1·0, rostri a rictu 1·85.

♀ fusca, corporis plumis omnibus pallide fusco late marginatis: abdomine fere fusco unicolori: long. tota cir. 5·7, alæ 3·35, caudæ 2·0, tarsi 1·0, rostri a rictu 0·9.

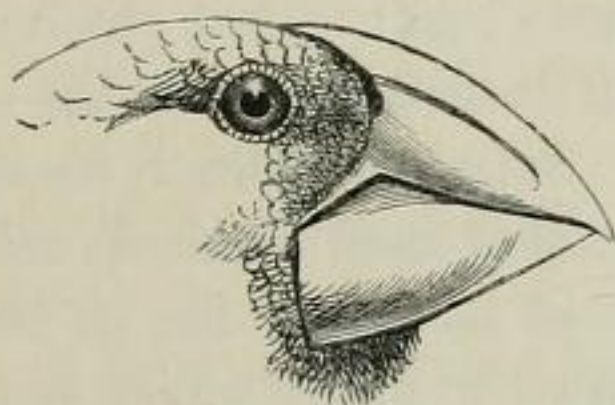
Hab. Charles Island and Chatham Island (*Darwin*).

Mus. Brit.

This species, the largest of the genus, did not come under Dr. Habel's notice. The only specimens I have seen are Mr. Darwin's types, now in the British Museum.

I have little doubt that a large series of the skins of this bird would show that the dimensions of the species graduate into those of *G. strenua*.

The accompanying woodcut shows the outline of the bill of *G. magnirostris*.



Geospiza magnirostris.

GEOSPIZA STRENUA.

Geospiza strenua, Gould, P. Z. S. 1837, p. 5; Darwin, Zool. Voy. Beagle, iii. p. 100, t. xxxvii.;
 ScL. & Salv. P. Z. S. 1870, p. 323; Sundev. P. Z. S. 1871, p. 124.

♂ (Bindloe Island) niger unicolor, crisso albo marginato: rostro nigerrimo: long. tota 5·75, alæ 3·2, caudæ 2·0, tarsi 1·0, rostri a rictu 0·75.

♂ *junior* (Bindloe Island) fuliginoso-niger, dorsi et abdominis plumis fusco marginatis: rostro nigricanti-corneo, flavido variegato: long. tota 5·75, alæ 3·2, caudæ 1·9, tarsi 0·95, rostro a rictu 0·75.

♂ *hornot.* (Bindloe Island), ♀ omnino similis, dorso et pectore forsan paulo obscurioribus: long. tota 6·0, alæ 3·1, caudæ 1·8, tarsi 1·0, rostri a rictu 0·75.

♀ (Bindloe Island) fusca, corporis plumis undique pallide fusco late marginatis: abdomine fere fusco-albido unicolori: long. tota 5·5, alæ 2·9, caudæ 1·9, tarsi 0·95, rostri a rictu 0·8.

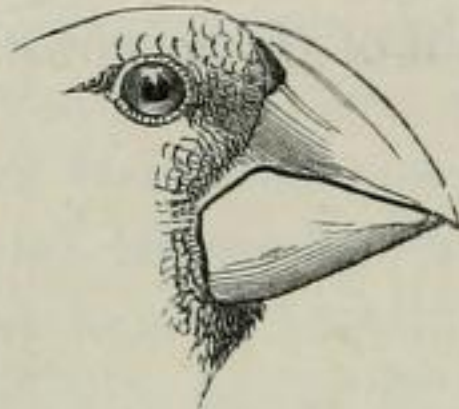
Hab. James Island and Chatham Island (*Darwin*); Indefatigable Island, Bindloe Island, and Abingdon Island (*Habel*); James Island (*Sundevall*).

The greatest variation prevails in the coloration of the males of this species. The absolutely black birds, which are doubtless the oldest males, are very few in proportion to the mottled ones, numbering only nine out of sixty-three specimens (male and female) before me. Of these nine three have yellowish marks on their bills. Between the wholly black birds and the youngest males there is every gradation of plumage, until we come to birds that do not differ appreciably from the females.

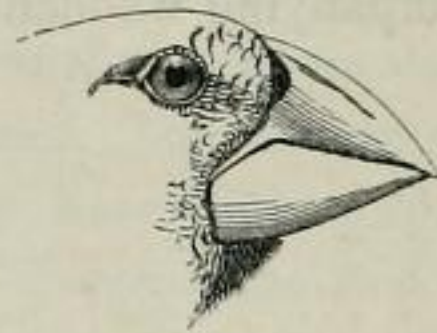
As regards the variation in size, especially of the bill, I find that no set of dimen-

sions is associated with any particular island, every gradation being observable in the large series from Abingdon Island. Dr. Habel had especially noted two birds as females of black males; and these two present almost the extremes as regards the size of their bills. Both are from Bindloe Island. The following table shows the extent to which this species varies in some of its dimensions. The woodcuts show the largest and smallest bills I have been able to select out of Dr. Habel's series.

The wing varies from	2·9 inches to 3·3 inches, or 0·4 inch.
The tail varies from	1·8 inch to 2·1 inches, or 0·3 inch.
The tarsus varies from	0·9 inch to 1·0 inch, or 0·1 inch.



Geospiza strenua ♂
(Abingdon Island).



Geospiza strenua
(Bindloe Island).

Dr. Habel notes that the colour of the iris is brown or dark brown, the tarsus black or grey, the underpart of the foot light brown or light grey, the bill brown, yellowish brown, or black, the gums straw-colour, and the food chiefly seeds.

"I felt disposed," Dr. Habel writes, "to separate two or three varieties of this species, not only on account of the colour of their plumage, but also because the black individuals keep apart from the others, are livelier in their movements, and quicker in their flight; they wander in small groups all over the island in which they live, uttering their short, not unpleasing song from the branch of a tree. The grey and the brown birds form a large flock, and search for their food in bushes or on the ground; they are slower in their movements, and utter a harsh, croaking note. Nearly all the specimens I obtained were from Bindloe and Abingdon Islands. On Indefatigable one only belonging to this species, and that the only one seen, was secured. It was found by the side of a small lagoon formed in the sand at high water. By filtering through the sand this water had lost its salt, and could be used for cooking. Hither the birds came to slake their thirst."—*H.*

GEOSPIZA DUBIA.

Geospiza dubia, Gould, P. Z. S. 1837, p. 6; Darwin, Zool. Voy. Beagle, iii. p. 103.

Hab. Chatham Island (*Darwin*).

Unrepresented in Dr. Habel's collection.

Mr. Darwin's type specimen has, since the dispersion of this Society's Museum, been lost sight of, as it is not to be found in the British Museum. With Bonaparte (*Consp.*

i. p. 543), I much doubt the possibility of maintaining *G. dubia* as a distinct species, based as it is on a female specimen whose dimensions are intermediate between *G. strenua* and *G. fortis*, both Chatham-Island species.

GEOSPIZA FORTIS.

Geospiza fortis, Gould, P. Z. S. 1837, p. 5; Darwin, Zool. Voy. Beagle, iii. p. 101, t. xxxviii.;
Scl. & Salv. P. Z. S. 1870, p. 323; Sundev. P. Z. S. 1871, p. 124.

Species *G. strenuæ* quoad colores omnino similis, magnitudine solum differens.

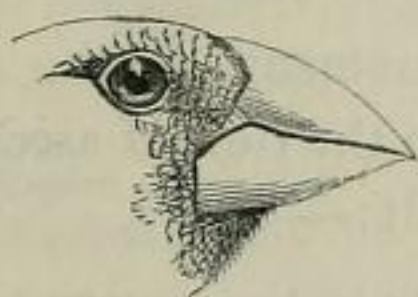
Hab. Charles Island (*Darwin, Sundevall*); Chatham Island (*Darwin*); Indefatigable Island, Bindloe Island, and Abingdon Island (*Habel*); James Island (*Sundevall*).

I am in much doubt whether to place a single female skin from Indefatigable Island with this species or with *G. strenua*; but as there seems to be a slight gap as regards its bill in the series between it and the specimens of that species where none exists on the side of *G. fortis*, I have placed it with the latter. Its wing measures 2.95 inches, and equals in this respect another specimen from Indefatigable; but in this the bill is a little smaller. In the length of its tail it exceeds by .05 inch any of the other specimens attributed to *G. fortis*; but in the length of its tarsus several others equal it.

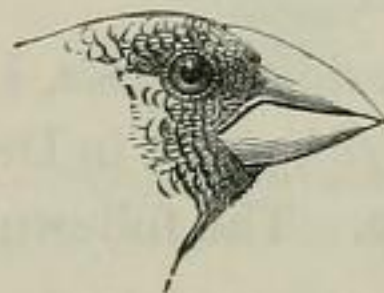
The extent to which individuals of this species vary as regards some of their dimensions is as follows:—

Wing varies from	2.5 inches to 2.95 inches, or 0.40 mch.
Tail varies from	1.5 inch to 1.85 inch, or 0.35 inch.
Tarsus varies from	0.8 inch to 0.90 inch, or 0.10 inch.

The extremes in the size of the bills is shown in the following woodcuts:—



Geospiza fortis ♀
(Indefatigable Island).



Geospiza fortis ♂
(Bindloe Island).

Dr. Habel's collection contains 23 specimens from Indefatigable Island, 16 from Bindloe Island, and 4 from Abingdon Island, the locality of one being unrecorded. The Indefatigable-Island specimens are of rather larger average dimensions than those from either Bindloe Island or Abingdon Island; and the females from Abingdon Island are darker than those from the other two islands.

Of *G. fortis* Dr. Habel writes as follows:—"A bold and destructive species, entering the tent in numbers, where, not content with picking up the rice that lay scattered about, they would make holes in the bag containing it to get at the grains. They paid no regard to the presence of man, and when chased away would instantly return again. Other allied species would also enter the tent in search of food; but *Geospiza fortis*

surpassed all in boldness. In the woods they are to be found on the ground picking up the seeds of the 'Palo santo' (*Guayacum sanctum*), and are always to be seen in small flocks. Two females only were obtained in Indefatigable Island, the rest in Bindloe. It is also found on Abingdon Island."—*H.*

GEOSPIZA NEBULOSA.

Geospiza nebulosa, Gould, P. Z. S. 1837, p. 5; Darwin, Zool. Voy. Beagle, iii. p. 101; Sundev. P. Z. S. 1871, p. 125.

Supra fusca, plumarum marginibus pallidioribus, pileo obscuriore; alis et cauda fusconigris, fusco-ochraceo marginatis; subtus pallide fuscescens, pectore et hypochondriis fusco maculatis: rostro pallido: pedibus corylinis: long. tota (cir.) 4·7, alæ 2·8, caudæ 2·65, tarsi 0·9.

Hab. Charles Island (*Darwin, Sundevall*); Chatham Island (*Sundevall*).

Mus. Brit.

This species was not represented in Dr. Habel's collection. The British-Museum specimen is apparently a female; and I doubt the possibility of distinguishing it from *G. fortis*. Its dimensions agree with the average of those of that species.

GEOSPIZA FULIGINOSA.

Geospiza fuliginosa, Gould, P. Z. S. 1837, p. 5; Darwin, Zool. Voy. Beagle, iii. p. 101; Scl. & Salv. P. Z. S. 1870, p. 323; Sundev. P. Z. S. 1871, p. 125.

Geospiza fuliginoux, Prévost et Des Murs, Voy. Vénus, Ois. p. 208.

Species quoad colores *G. strenuæ* et *G. forti* omnino similis, sed statura minore differens.

Hab. Chatham Island and James Island (*Darwin, Sundevall*); Indefatigable Island (*Habel*).

As in the previous species, I have taken the measurements of the numerous specimens (33) of *G. fuliginosa* in Dr. Habel's collection with the view of ascertaining to what extent they vary. The following is the tabulated result:—

Wing varies from	2·25 inches to 2·55 inches, or 0·30 inch.
Tail varies from	1·40 inch to 1·65 inch, or 0·25 inch.
Tarsus varies from	0·70 inch to 0·85 inch, or 0·15 inch.

The extent to which the bills vary is shown in the woodcuts:—



Geospiza fuliginosa ♂
(Indefatigable Island).



Geospiza fuliginosa
(Indefatigable Island).

It will be noticed that this bird appears to be absent from both Bindloe and Abingdon Islands, the still smaller *G. parvula* being found there. The omission of

this term in the series makes *Geospiza fortis* well defined, so far as these two islands are concerned, from *G. parvula*. But then we find *G. strenua*, the next larger in point of size to *G. fortis*; so that no rule can be traced showing that in each island the *Geospizæ* are well defined by the omission of some one or more intermediate species to be sought for in some other island.

Of this bird Dr. Habel says, "The members of this species, like the rest of the members of the genus *Geospiza*, associate in small flocks. Although seeds and other vegetable substances form their chief food, they resort at low tide to the sea-shore in search of sustenance."—*H.*

GEOSPIZA PARVULA.

Geospiza parvula, Gould, P. Z. S. 1837, p. 6; Darwin, Zool. Vog. Beagle, iii. p. 102, t. xxxix.;
Scl. & Salv. P. Z. S. 1870, p. 323; Sundevall, P. Z. S. 1871, p. 125.

Species quoad colores *G. strenuæ* similis, sed totius generis minima.

Hab. James Island (*Darwin*); Chatham Island (*Sundevall*); Bindloe and Abingdon Islands (*Habel*).

Considerable variation is shown in the size of individuals of this species, as will be seen from the following table:—

Wing varies from	2·15 inches to 2·40 inches, or 0·25 inch.
Tail varies from	1·30 inch to 1·50 inch, or 0·20 inch.
Tarsus varies from	0·63 inch to 0·72 inch, or 0·09 inch.

the variations in the bill being, as in the former cases, shown by the woodcuts:—



Geospiza parvula ♂
(Bindloe Island).



Geospiza parvula ♀
(Bindloe Island).

"In habits this species resembles the foregoing, with which it consorts."—*H.*

GEOSPIZA DENTIROSTRIS.

Geospiza dentirostris, Gould, P. Z. S. 1837, p. 6; Darwin, Zool. Voy. Beagle, iii. p. 102; Scl. & Salv.
P. Z. S. 1870, p. 323.

♂ niger, crisso stricte albo marginato: rostro nigro, maxilla dentata: pedibus obscure corylinis: long. tota 4·5, alæ 2·4, caudæ 1·4, tarsi 0·8.

♀ fusco-nigra, subtus pallido fusco variegata: long. tota 4·3, alæ 2·35, caudæ 1·35, tarsi 0·8.

Hab. Galapagos (*Darwin*); Abingdon Island (*Habel*).

Dr. Habel obtained five specimens of this species in Abingdon Island, of which four are marked males and one female. One only of the males is in the black dress of the

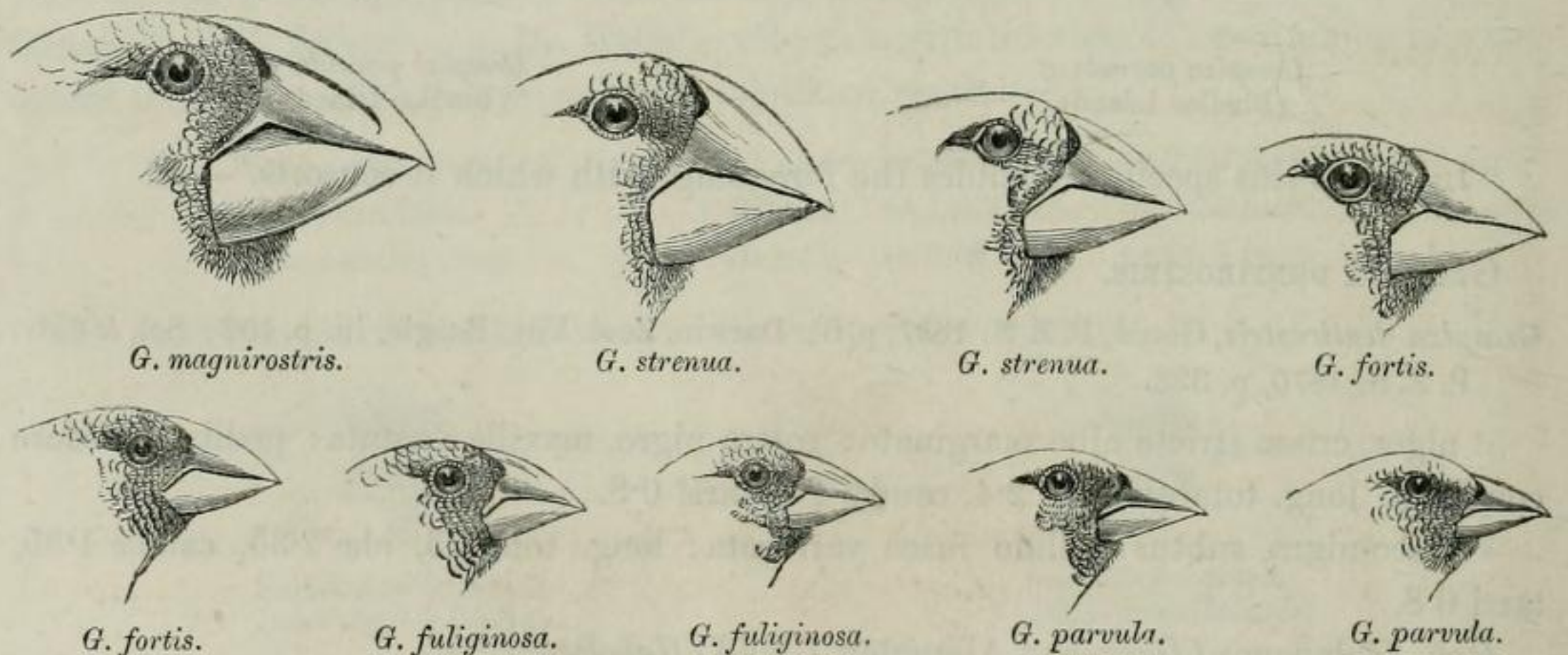
adult. In this the crissum is nearly pure black, the feathers being very narrowly edged with white. The bill, as pointed out by Mr. Gould, has a distinct tooth-like prominence in the middle of the cutting-edge of the mandible on either side. The female is darker than is usual in other *Geospizæ*.

Of *G. dentirostris* Dr. Habel says:—"Usually seen in groups of families, frequenting low bushes in search of fruit, the members uttering a cheerful chirping note. In the morning they visit the bushes growing near the shore; later in the day they retire more inland. I only met with this bird on Abingdon Island, where it predominates over the other species in numbers."—*H.*

Before passing to the next genus I will recapitulate the measurements of all the above species of *Geospiza*, except *G. nebulosa* and *G. dubia*, of which our knowledge is as yet incomplete, and also *G. dentirostris*, which seems to have distinct characters of its own.

	<i>G. magnirostris.</i>	<i>G. strenua.</i>	<i>G. fortis.</i>	<i>G. fuliginosa.</i>	<i>G. parvula.</i>
	inches.	inches.	inches.	inches.	inches.
Wing . . .	3·5	3·3-2·9	2·95-2·5	2·55-2·25	2·40-2·15
Tail . . .	2·0	2·1-1·8	1·85-1·5	1·65-1·4	1·50-1·3
Tarsus . . .	1·05	1·0-0·9	0·90-0·8	0·85-0·7	0·72-0·63

Of all except *G. magnirostris* the largest and smallest measurements are given. From this table it will be at once seen that the gradations from the largest to the smallest species are quite complete, and that the only grounds for separating them at all rests upon the dimensions of the bill, where the steps are not quite so gradual. But the dimensions of the bills furnish but slender specific characters, as will be seen by the accompanying cut.



The important and indisputable fact remains that whether we treat *Geospiza* as including one highly variable species, or as comprising several in themselves variable

species, we have in these islands an instance of instability as regards size not often met with in the class Aves. In some members, however, of the genus *Oryzoborus*, allied to *Guiraca*, considerable variation is to be found in size, especially of the bill; I refer to *O. crassirostris*, which has been divided into four or more so-called species, and to *O. torridus*, which has not, so far as I am aware, been divided at all.

Genus CACTORNIS.

In 1843 Mr. Gould described a bird from Bow or Harp Island, one of the Low archipelago, which he placed in the genus *Cactornis*, under the name *C. inornatus*. The specimen, which was obtained by Mr. Hinds, and subsequently figured in the 'Zoology of the Voyage of the Sulphur,' at the time it was described formed part of the collection of this Society, and afterwards passed into the British Museum. The type appears to be a specimen of an immature bird, but it belongs to a genus distinct from *Cactornis*, the tail being longer and somewhat forked, the bill more slender and curved, and the mandible slightly projecting, and shows some affinity to *Hemignathus*. G. R. Gray referred this bird to the Sandwich-Islands genus *Loxops*, calling it in his 'Hand-list' (i. p. 114) *Loxops inornata*; but it does not appear to be strictly congeneric with that bird, the nostrils being exposed and not covered with densely set feathers. The single specimen upon which Mr. Gould founded his *Cactornis inornata* is not sufficiently mature for me to pronounce decidedly upon its position, but it appears to belong to a distinct genus. Anyhow I feel justified in removing the bird from the genus *Cactornis*, where Mr. Gould placed it.

Omitting then *C. inornata* from *Cactornis*, this genus remains peculiar to the Galapagos Islands. Its relationship to *Geospiza* is evident, the chief difference being the great elongation of the bill compared with the stout bill of the latter genus.

CACTORNIS SCANDENS.

Cactornis scandens, Gould, P. Z. S. 1837, p. 7; Darwin, Zool. Voy. Beagle, iii. p. 104, t. xlii.; Sel. & Salv. P. Z. S. 1870, p. 323; Sundev. P. Z. S. 1871, p. 124.

Tisserin des Gallapagoes, Néboux, Rev. Zool. 1840, p. 291.

Cactornis grimpeur, Prévost et Des Murs, Voy. Vénus, Ois. p. 204.

♂ nigerrimus, crissi plumis albo marginatis: rostro nigro flavo variegato, pedibus corylino-nigris: long. tota 5.75, alæ 2.85, caudæ 1.75, tarsi 0.9, rostri a rictu 0.7.

♂ juv. fuliginoso-niger, pileo obscuriore; gula et pectoris plumis fusco marginatis; ventre imo et crisso sordide fuscis.

♀ fusca, pileo obscuriore; ventre imo et crisso multo pallidioribus: dorsi, gulæ et pectoris plumis pallido fusco marginatis: long. tota 5.25, alæ 2.7, caudæ 1.6, tarsi 0.83, rostri a rictu 0.65.

Hab. James Island (*Darwin, Sundevall*); Charles Island (*Néboux, Sundevall*); Indefatigable Island (*Habel*).

“I found seeds in the stomachs of almost all of the specimens of *Cactornis* obtained on Indefatigable, whilst fibres of *Opuntia* were found in those from Bindloe. The reason of this doubtless is to be found in the fact that in the former island are many ponds of brackish water, where all the birds resort to drink. No such ponds exist on Bindloe or Abingdon, still less springs of water. Consequently the birds are entirely restricted for water to the morning dew and the drops produced by steam which, issuing out of the crevices of the rocks, becomes condensed on the foliage of the surrounding herbage. On Bindloe and Abingdon these birds resort more to the juice of the succulent leaves and fruit of the different species of *Opuntia*. Thus feeding, the feathers of the face of these birds become matted together. Their food also includes some gravel and insects.”—*H.*

CACTORNIS ASSIMILIS.

Cactornis assimilis, Gould, P. Z. S. 1837, p. 7; Darwin, Zool. Voy. Beagle, iii. p. 105; ScL. & Salv. P. Z. S. 1870, p. 323.

♂ *hornot.* fuliginosus, plumis singulis pallidioribus fusco marginatis: subtus, præcipue in ventre imo et crisso, plumarum marginibus latioribus: rostro flavescenti-corneo, pedibus corylinis: long. tota 5·0, alæ 2·7, caudæ 1·65, tarsi 0·8, rostri a rictu 0·75.

♀ et ♂ juv. omnino similes sunt.

Hab. Galapagos (*Darwin*); Bindloe Island (*Habel*).

Obs. Sp. *C. scandenti* similis sed rostro robustiore forsitan differt.

None of Dr. Habel's birds are adult; so that we have not yet seen that state of this species, which differs only slightly from *C. scandens*, and may ultimately prove to be not really distinct. Dr. Habel's note on it is as follows:—“All my specimens of this species were shot whilst feeding on the cactus plants. From the agglutinated state of the feathers of the face, which is more commonly seen in this than in other birds, it would appear that it feeds almost exclusively on the cactus. One of the females had very few feathers on the head and neck, and those badly trimmed in consequence of her rubbing and scratching her head. This I found to be occasioned by the presence of parasitic worms situated under the external covering of the skull.”—*H.*

CACTORNIS ABINGDONI.

Cactornis abingdoni, Salv. P. Z. S. 1870, p. 326.

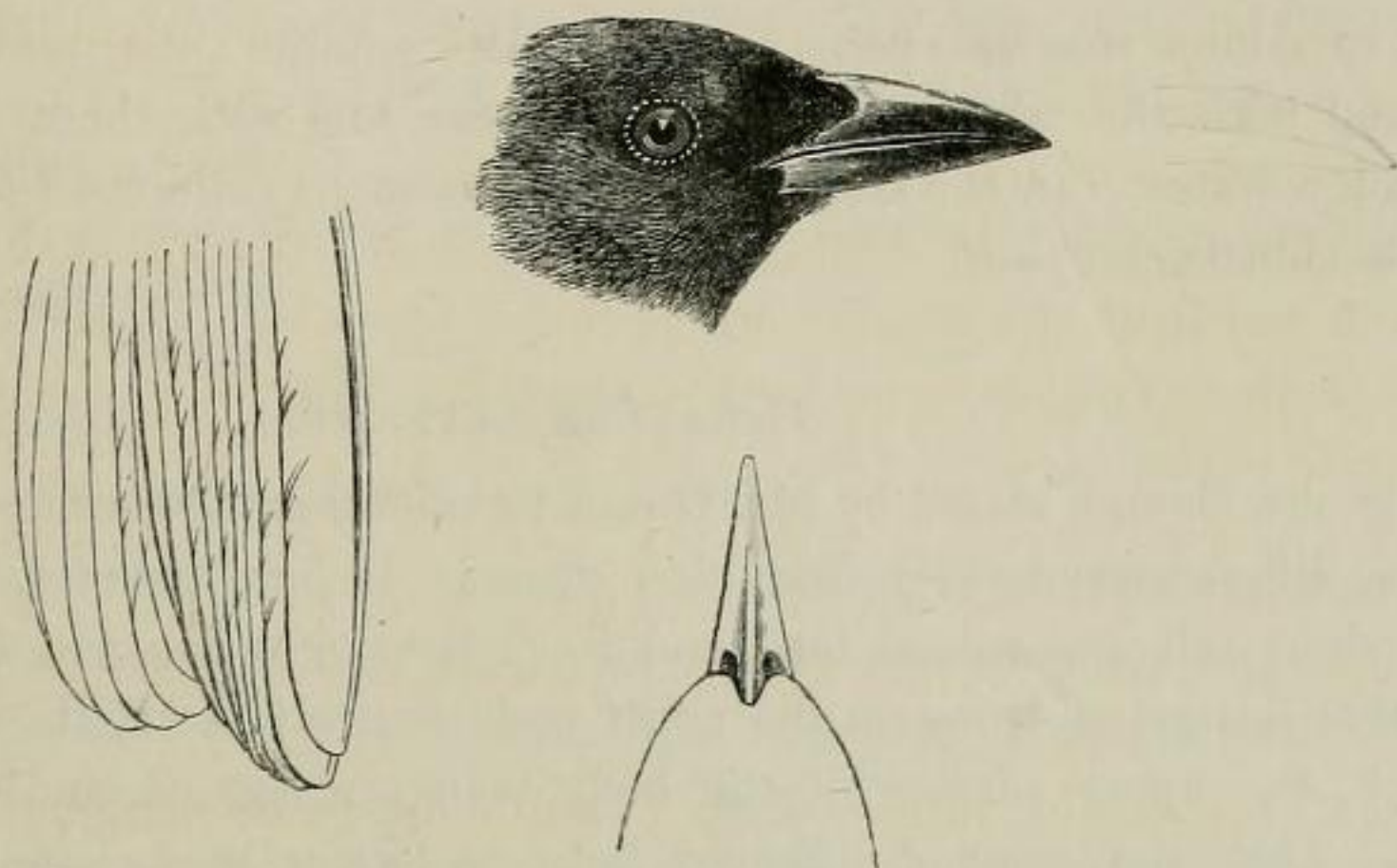
Fuscescenti-nigra, alis caudaque nigris fusco anguste limbatis: subtus nigra, ventre fuscescentiore et griseo variegato: tectricibus subalaribus nigricantibus: rostro elongato incurvo nigro: pedibus obscure fuscis: long. tota 5·0, alæ 2·8, caudæ 1·6, rostri a rictu 0·8, tarsi 0·9.

Hab. Abingdon Island (*Habel*).

Obs. Proxima *C. scandenti*, sed rostro elongato, magis compresso, nigro differt.

The narrowness and the black colour of the bill seem to distinguish this bird from

the commoner *G. scandens*. Neither of Dr. Habel's specimens is quite adult, when doubtless the plumage is of the same black colour as that of its congeners. Dr. Habel notes that he found vegetable substances in the stomachs of these birds, and that the

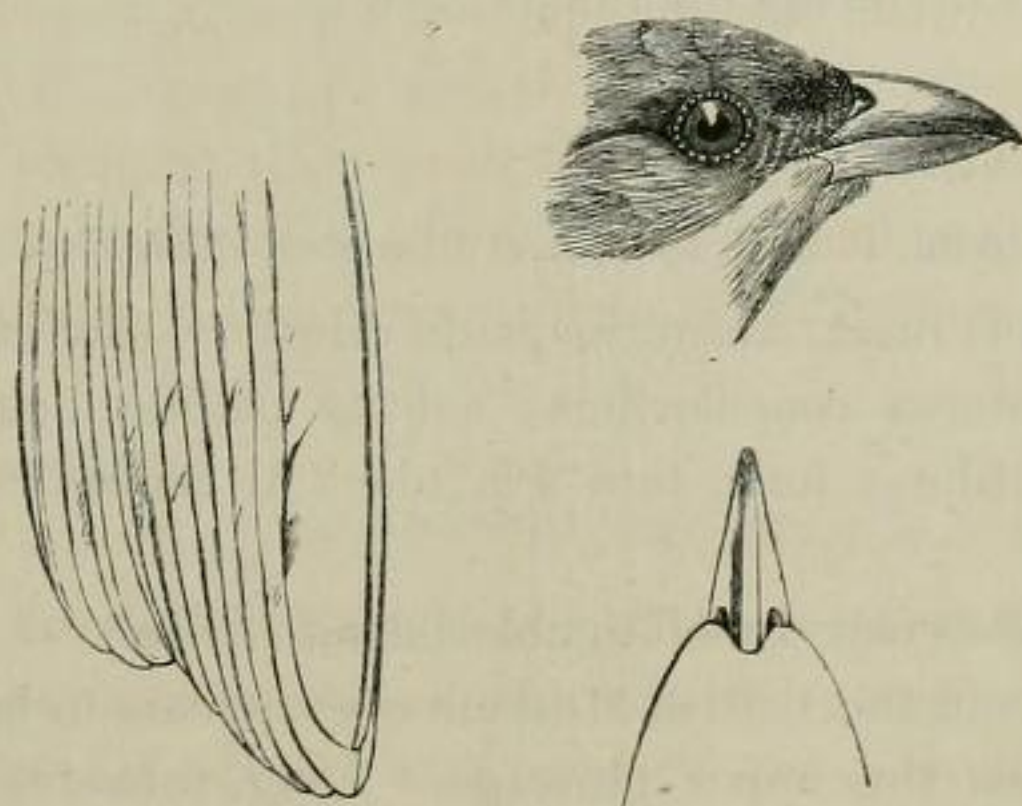


Cactornis abingdoni.

feathers of the head were sticky from the juice of the cactus they eat. He adds:—
“*C. abingdoni* I found only on Abingdon. Its habits are quite similar to those of the other species of the genus.”—*H.*

CACTORNIS PALLIDA.

Cactornis pallida, Sel. & Salv. P. Z. S. 1870, p. 327.



Cactornis pallida.

Supra olivaceo-fusca, alis caudaque obscure fuscis, dorsi colore anguste limbatis: subtus pallide ochracea: tectricibus subalaribus et remigum marginibus internis albis:

rostro pallide corneo, pedibus nigris: long. tota 4·7, alæ 2·7, caudæ 1·7, rostri a rictu 0·65, tarsi 0·9. *Fem.* mari similis.

Hab. Indefatigable Island (*Habel*).

Obs. Colore ab omnibus distincta, sed forsitan avis haud adulta. Attamen mas et femina, specimina sola quæ nobis adsunt, vestitu omnino congruunt.

“Found with the various species of *Geospiza*, and with them frequenting the seashore at low water. In the stomachs of the specimens collected I found insects, besides vegetable substances.”—*H.*

Genus CAMARHYNCHUS.

This genus, though stated by Mr. Gould to belong to the same group of Finches as *Geospiza*, differs considerably from that genus. It has, however, the same characteristically short tail and robust tarsi and feet; the coloration, too, is somewhat similar, except that instead of being in the adult male entirely black, the head and neck alone are black, the upper surface of the body being variegated and the under white or mottled. The chief point of difference between *Camarhynchus* and *Geospiza* lies in the form of the bill. The lower edge of the maxilla in *Camarhynchus* is not nearly so strongly angulated, but in some species is nearly straight and in others continuously curved. The bill, too, of the former is more compressed, being less tumid in the portion immediately anterior to the nostrils.

As regards its bill *Camarhynchus* has perhaps its nearest ally in *Neorhynchus*, a genus represented by one species, *N. nasesus*, which is found on the west coast of Peru. But *Neorhynchus* has a still more robust bill, and the edges of the mandible strongly arched; the tail, too, is of a length usual in *Spermophila*, and the feet of normal strength; in coloration *Neorhynchus* is decidedly Spermophiline.

CAMARHYNCHUS PSITTACULUS.

Camarhynchus psittaculus, Gould, P. Z. S. 1837, p. 6; Darwin, Zool. Voy. Beagle. iii. p. 103, t. xl.

♀ (Indefatigable Island) fusca, uropygio paulo dilutiore, alis et cauda obscurioribus, plumarum marginibus dorso concoloribus: subtus pallide ochrascenti-fusca: rostro flavido, pedibus nigricantibus: long. tota 4·5, alæ 2·6, caudæ 1·6, tarsi 0·85, rostri a rictu 0·5.

Hab. James Island (*Darwin*); Indefatigable Island (*Habel*).

Obs. Of two specimens in the British Museum one appears to be a young male, being darker than the other on the upper plumage. Long. tota 4·6, alæ 2·75, caudæ 1·6, tarsi 0·9, rostri a rictu 5·5.

The other specimen is paler above, and is probably a female.

Dr. Habel only obtained a single specimen of this species, of which he remarks:—“The habits of this species resemble those of the *Geospizæ*.”—*H.*

CAMARHYNCHUS CRASSIROSTRIS.

Camarhynchus crassirostris, Gould, P. Z. S. 1837, p. 6; Darwin, Zool. Voy. Beagle, iii. p. 103, t. xli.

Supra cinereus: capite fuliginoso-nigro: subtus albidus, gula et pectore superiore plumis singulis medialiter nigris; tectricibus alarum et rectricum apicibus fusco albido marginatis: long. tota 5·2, alæ 3·0, caudæ 1·9, tarsi 0·85, rostri a rictu 0·5.

Hab. Charles Island (?) (*Darwin*).

The type specimen in the British Museum, from which the above description is taken, is probably an adult male.

CAMARHYNCHUS VARIEGATUS. (Plate LXXXV.)

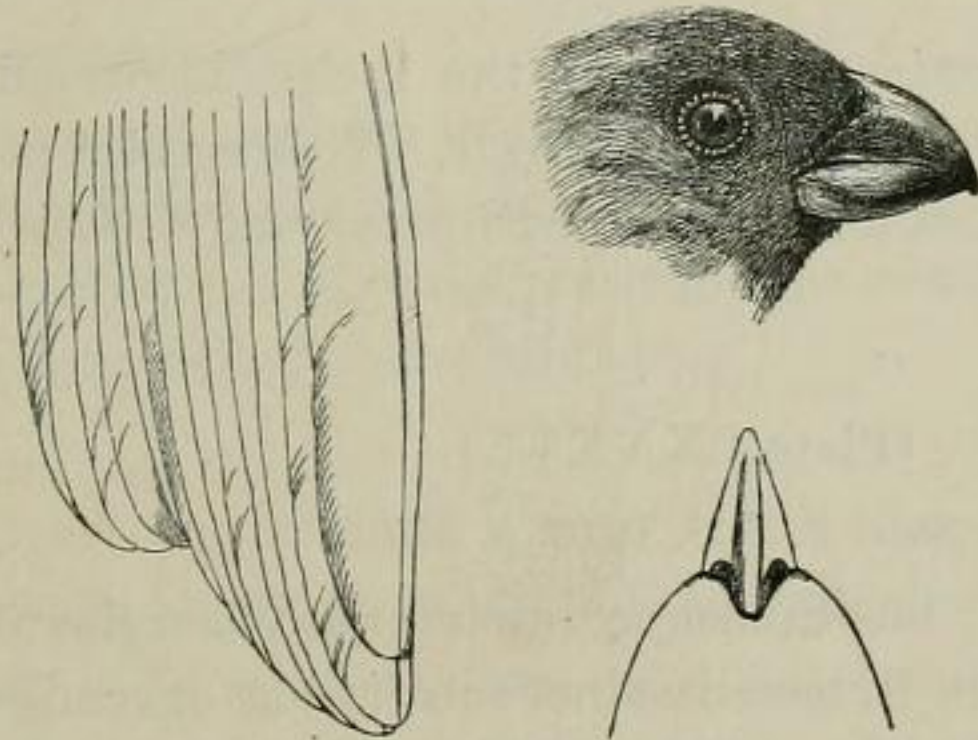
Camarhynchus variegatus, ScL. & Salv. P. Z. S. 1870, p. 324.

Supra sordide olivaceus fusco variegatus, alis caudaque nigricantibus, remigibus extus anguste fusco marginatis, capite toto undique et corpore subtus ad medium pectus nigris: ventre sordide ochraceo in summa parte nigro variegato: rostro et pedibus nigris: long. tota 5·5, alæ 3·3, caudæ 2·1, rostri a rictu 0·55, tarsi 1·1.

♀ supra fusca; subtus sordide ochracea, a mento usque ad ventrem nigricante frequenter variegata: rostro pallide corylino, pedibus nigris.

Hab. Bindloe and Abingdon Islands (*Habel*).

Obs. major quam *C. psittaculus* et capite nigro insignis, sed rostro, quoad formam, fere simili. Remiges secundus tertius et quartus fere æquales et longissimi.



Camarhynchus variegatus.

“In habits this bird resembles the members of the genus *Geospiza*. It utters a song which, however, is not so harmonious as that of the species next mentioned, with which it bears some affinity. *C. habeli* I met with singly, but this species in families of several individuals, gaily chirping, and eagerly selecting the swelling fruits of the *Euphorbia* bushes.”—*H.*

CAMARHYNCHUS PROSTHEMELAS.

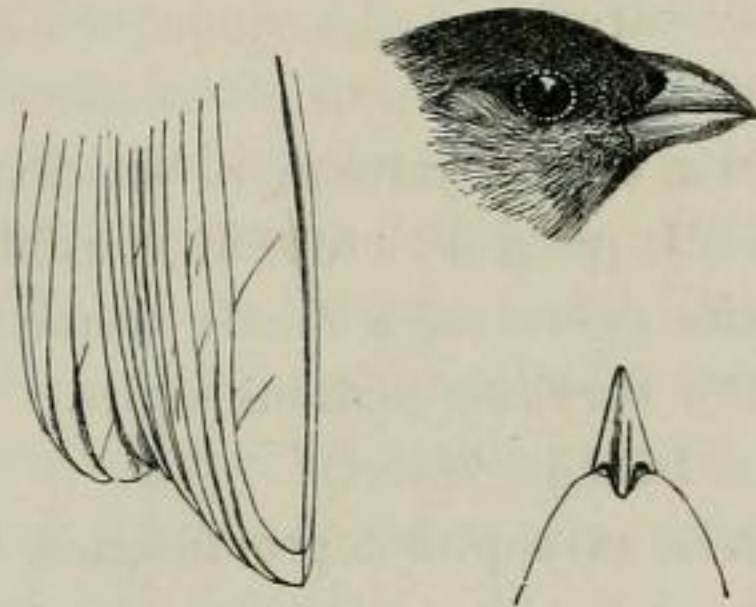
Camarhynchus prosthelas, Scl. & Salv. P. Z. S. 1870, p. 325; Sundev. P. Z. S. 1871, p. 125.

Supra niger, dorso olivaceo tincto: alis extus et cauda fuscis colore pallidiore limbatis: subtus niger, ventre toto pallide olivaceo: rostro rubello, pedibus fuscis.

♀ supra olivaceo-fusca, alis caudaque saturate fuscis, illarum marginibus dilute fuscis: subtus ochraceo-albida: long. tota 3·7, alæ 2·4, caudæ 1·5, rostri a rictu 0·4, tarsi 0·8.

Hab. Indefatigable Island (*Habel*); Chatham, Charles, and James Islands (*Sundevall*).

The smallest of the species of *Camarhynchus*. Our description of the male was taken from a specimen in the British Museum, brought by Mr. Darwin, but never described.



Camarhynchus prosthelas.

“Associates with *Geospiza* in visiting the rocks uncovered at low water. The stomachs of some specimens contained insects. This species and *C. psittaculus* I only found on Indefatigable Island, whilst *C. variegatus* and *C. habeli* inhabit Bindloe and Abingdon.”—*H.*

CAMARHYNCHUS HABELI. (Plate LXXXVI.)

Camarhynchus habeli, Scl. & Salv. P. Z. S. 1870, p. 325.

Supra olivaceo-griseus: alis caudaque fuscis griseo marginatis: capite undique cum pectore toto nigris: ventre lactescenti-albo, subalaribus et remigum marginibus internis albis: rostro valde compresso, culmine utrinque sulcato, colore sicut pedum nigro: long. tota 5·6, alæ 2·8, caudæ 1·8, rostri a rictu 0·5, tarsi 0·9.

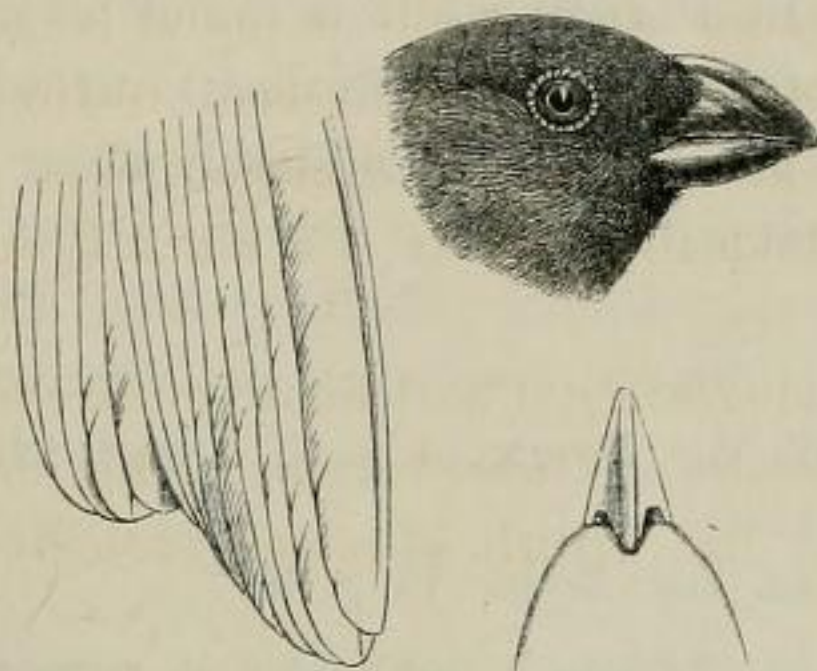
♀ grisea, subtus albida, capite nigro omnino carens.

Hab. Bindloe and Abingdon Islands (*Habel*).

Obs. Præcedenti similis, sed minor et rostro magis compresso et maculis abdominis nullis.

“A melodious song, strange to my ear, led me to look for a new bird, as this one proved to be. I never saw it associating in flocks like the *Geospizæ*, but always solitary individuals. From this fact I infer that it is not very numerous, which it certainly is

not on Bindloe, where I was unable to secure a female. It is more numerous on Abingdon, the only other island on which it is found except Albemarle. It not only



Camarhynchus habeli.

picks the *Opuntia* bushes to get at the juice, which serves it for water, but it also swallows the pulp as food. Its song is harmonious, and the bird one of the best songsters of these islands."—*H.*

[CAMARHYNCHUS CINEREUS.

Guiraca cinerea, Lafr. Mag. de Zool. 1843, pl. 30.

Camarhynchus cinereus, Bp. Consp. i. p. 542.

Guiraca cendré, Prév. et Des Murs, Voy. Vénus, Ois. p. 209.

Hab. Galapagos (*Léchlancher*).

I have not seen this species, and am unable to recognize it in Dr. Habel's collection. Judging from the figure (a bad one), the bird would appear to be quite distinct from any other of the known Galapagan birds. Lafresnaye considered it to belong to a distinct subgenus, which he called *Piezorhina*¹.]

Genus DOLICHONYX.

A widely ranging North-American genus of the family Icteridæ, migrating in winter to the northern portions of South America. *D. oryzivorus* is the only land-bird found in the Galapagos specifically identical with that found on the mainland.

DOLICHONYX ORYZIVORUS.

Emberiza oryzivora, Linn. Syst. Nat. i. p. 311.

Dolichonyx oryzivora, Sw. Zool. Journ. iii. p. 351; Darwin, Voy. Beagle, iii. p. 106.

Hab. James Island (*Darwin*).

¹ In his 'Conspectus Avium' (i. p. 479) Prince Bonaparte described a Fringilline bird from the Galapagos as *Zonotrichia galapagoensis*. From an examination of this type in the Paris Museum it appears to me to be only a specimen of the Californian *Z. coronata*, to which a wrong locality has been assigned.

Genus PYROCEPHALUS.

This genus is of purely Neotropical range, its most northern range extending in *P. mexicanus* to Mexico. In *P. rubineus* it is found in imperfectly segregated races all over the greater part of the southern continent, including the shores of Ecuador opposite the Galapagos Islands. *P. nanus* is closely allied to the other species of the genus, and strictly congeneric with them.

PYROCEPHALUS NANUS.

Pyrocephalus nanus, Gould, Zool. Voy. Beagle, iii. p. 45, t. vii. ; Scl. & Salv. P. Z. S. 1870, p. 323 ; Sundev. P. Z. S. 1871, p. 125.

Pyrocephalus dubius, Gould, Zool. Voy. Beagle, iii. p. 46.

♂ (Indefatigable Island) fusco-niger: pileo toto et corpore subtus coccineis: tectricibus subalaribus rosaceis: rostro et pedibus nigris: long. tota 4·25, alæ 2·5, caudæ 2·5, tarsi 0·7, rostri a rictu 0·7.

♀ (Indefatigable Island) fusca, alis caudaque paulo obscurioribus: loris et corpore subtus albis, abdomine luteo induto: rostro et pedibus nigris: long. tota 4·5, alæ 2·5, caudæ 2·1, tarsi 0·75, rostri a rictu 0·7.

♂ *juv.* feminae omnino similis, sed pectore striis fuscis indistincte notato.

Hab. "Several islands of the Galapagos" (*Darwin*); Indefatigable and Bindloe Islands (*Habel*); Indefatigable and James Islands (*Sundevall*).

Having examined the types of *P. dubius* in the British Museum, I believe them to be young males of *P. nanus*. This may account for their different appearance in life from *P. nanus*, to which Mr. Darwin alludes. It also accounts for the slightly smaller dimensions compared with the adults to which I believe them to belong.

"Nearly related to a common and favourite species of the mainland of Ecuador, which is known by the name of 'Chocoterin.' The female is tamer than the male, and frequents shady spots under the trees. The male seeks a solitary bush, from which he darts upon his prey. The plumage of the young male resembles that of the female. This species was found on all the islands visited."—*H.*

Genus MYIARCHUS.

This, too, is a member of a Neogean family, the species of which are distributed over the greater part of the two continents, as well as the West Indies. Its nearest allies are perhaps the island races of the Antilles rather than those of the continent; and in this respect the affinities of *Dendræca aureola* are, to some extent, repeated; but in the present case the specific differences of *M. magnirostris* are well defined.

MYIARCHUS MAGNIROSTRIS.

Tyrannula magnirostris, Gould, MS.

Myiobius magnirostris, G. R. Gray, Zool. Voy. Beagle, iii. p. 48, tab. viii.

Myiarchus magnirostris, Scl. & Salv. P. Z. S. 1870, p. 323; Sundev. P. Z. S. 1871, pp. 125, 127.

♂ (Indefatigable Island) supra fuscescens, capite paulo obscuriore ac rufescentiore, uropygio dilutiore: alis interne fuscis, remigibus rufescente marginatis, tectricibus pallido fusco limbatis: cauda fusca, rectricibus internis in pogonio interno rufescentibus, extimis fusco albidis: subtus, gula cinerea, abdomine pallide flavo, pectore paulo grisescentiore: rostro et pedibus nigris: long. tota 5·25, alæ 2·65, caudæ 2·45, tarsi 0·9, rostri a rictu 0·75.

♀ mari omnino similis.

Hab. Chatham Island (*Darwin, Sundevall*); James Island (*Sundevall*); Indefatigable, Bindloe, and Abingdon Islands (*Habel*).

“This Tyrant-bird was found on all the islands visited. It utters a feeble cry like that of the preceding species. It brings its mandibles together with an audible snap as they close upon its insect prey.”—*H.*

Genus ASIO.

Asio galapagensis is barely separable from the widely spread *A. brachyotus*, which extends not only over the greater part of the Old World, except Australia, but also is found in North America and as far south as the Falkland Islands. *Asio* is also an inhabitant of the Sandwich Islands.

ASIO GALAPAGENSIS.

Brachyotus galapagoensis, Gould, P. Z. S. 1837, p. 10.

Otus galapagoensis, Darwin, Zool. Voy. Beagle, iii. p. 32, t. iii.; Scl. & Salv. P. Z. S. 1870, p. 323.

Asio galapagoensis, Strickl. Orn. Syn. p. 211.

Asioni brachyoto similis, sed minor, coloribus obscurioribus, hypochondriorum fasciis transversis fuscis et tarsi plumatis striis longitudinalibus ornatis distinguendus: long. tota 14, alæ 11·25, caudæ 5·6, tarsi 2·1. (♂.)

Hab. James Island (*Darwin*); Indefatigable Island (*Habel*).

Dr. Habel's six specimens of this Owl agree closely with one another, and with the plate in the 'Zoology of the Voyage of the Beagle.' They confirm the differences pointed out by Mr. Darwin between it and the well-known Short-eared Owl, to which I have alluded above. This being the case, I think the species must stand under a distinct title, though these differences are but slight.

Of this bird Dr. Habel writes:—"A common species on Indefatigable, but not observed by me either on Bindloe or Abingdon. I saw it on Hood's Island. Specimens were covered with lice, which ran over my hands and arms as I took off the skins. Under the skin, near the throat, of a male I found twenty-six parasitic worms."—*H.*

Genus STRIX.

The most recent views unite the Barn-Owl of America with the European *Strix flammea*, which ranges, under various names, over the whole of Asia and Australia. *Strix punctatissima* is a distinct and peculiar species, well differentiated from the widely ranging bird.

STRIX PUNCTATISSIMA.

Strix punctatissima, G. R. Gray, Zool. Voy. Beagle, iii. p. 34, tab. iv.; Sci. & Salv. P. Z. S. 1870, p. 323.

♂ (Indefatigable Island) supra griseo-nigricans, albo minutissime irroratus: plumis singulis (remigibus et rectricibus inclusis) macula subapicali nigra, apicibus ipsis albis nigro circumdatis: subtus ochrascenti-albus, nigro vermiculatus, plumis singulis macula subapicali nigra, deinde macula subrotundata alba terminatis: disco faciali extus rufo, gulam versus multo obscuriore, intus nigro irrorato; facie rosaceo-alba: loribus et oculorum ambitu fuscis: alis et cauda ochraceo-fulvis fusco vermiculatis, illis fasciis latis fuscis transfasciatis: hac fasciis quatuor transversis angustis fuscis notata: tarsorum dimidio antico plumato, dimidio postico et digitis plumis sparsis capilliformibus vestitis: long. tota 12.0, alæ 9.0, caudæ 4.1, tarsi 2.4.

Hab. James Island (*Darwin*); Indefatigable Island and Abingdon Island (*Habel*).

Strix punctatissima is, I believe, restricted in its range to the Galapagos, though its presence elsewhere has been asserted more than once. In Strickland's 'Ornithological Synonyms' (p. 182) it is stated to be found at Para; but having recently examined Strickland's bird I find it identical with the Australian *S. castanops*, an erroneous locality having been doubtless attached to the specimen. Professor Orton, in his notes on some birds in the Museum of Vassar College (Am. Nat. iv. p. 711), says that *S. punctatissima* is rather abundant in the valley of Quito. I omitted to examine his specimens when visiting Vassar College last year (1874), but am inclined to believe that they should rather be referred to the ordinary South-American form of *S. flammea*.

Dr. Habel says:—"I only obtained two specimens of this Owl, both on Indefatigable, and did not observe it on either Bindloe or Abingdon or the other islands touched at. From this I gather that it is not an abundant species, unless its habit of not stirring until nightfall is the reason I did not observe it oftener. *Asio galapagensis* came near our tent soon after sundown. The food of *Strix punctatissima* appears to consist chiefly of insects, as I found the remains of grasshoppers in their stomachs."—*H.*

Genus BUTEO.

Most recent authorities place the large accipitrine bird of the Galapagos in the genus *Buteo*, though Mr. Gould instituted a genus *Craxirex*¹ to receive it. Under this name a wide-ranging species of the American continent, *C. unicinctus*, has been classed. In

¹ Changed by Sundevall to *Dromolestes*, Öfvers. af K. Vet. Ak. Förh. 1874, p. 27.

certain respects, especially in the relationship as to colour between young and old, *B. galapagensis* has some affinity to this bird; but structurally *B. galapagensis* is a *Buteo*, and its divergence from the ordinary typical form is too slight to warrant generic separation.

BUTEO GALAPAGENSIS.

Polyborus galapagoensis, Gould, P. Z. S. 1837, p. 9.

Craxirex galapagoensis, Gould; Darwin, Zool. Voy. Beagle, iii. p. 23, t. ii.; Sci. & Salv. P. Z. S. 1870, p. 323.

Buteo galapagensis, Sundev. P. Z. S. 1871, p. 125; Sci. & Salv. Nomencl. p. 119; Sharpe, Cat. Acc. p. 170.

Buteo leucops, G. R. Gray, Hand-list, i. p. 36 (descr. nulla).

♂ *ad.* (Abingdon Island) fuliginosus unicolor: remigum pogoniis internis grisescenti-albidis fusco variegatis, fascias irregulares formantibus: cauda fuliginoso-nigra, rectricibus mediis griseo, externis, præcipue in pogonio interno, albido transfasciatis: tectricibus caudæ superioribus griseo et fusco transfasciatis: inferioribus rufescente tinctis: iride obscure fulva, pedibus flavis: long. tota 20·0, alæ 16·0, caudæ 8, tarsi 2·9, rostri a rictu 1·7. ♀ mari similis sed major: long. tota 22·0, alæ 17·0, caudæ 9·0, tarsi 3·1.

Jun. supra fuliginosus, fulvo variegatus, dorsi plumis ad basin albis medialiter fusco transfasciatis, capitis et colli plumis ad basin albis, medialiter fulvis, fuliginoso terminatis: subtus fulvus, fusco præcipue in pectore variegatus, ventre et tibiis rufescente magis lavatis: alis et cauda sicut in ave adulta.

Hab. Galapagos Islands (*Darwin*); Indefatigable and Abingdon Islands (*Habel*).

Dr. Habel gives the following remarks respecting this species, which he observed in all the islands which he visited.

“Having obtained both male and female birds in the ochre-coloured plumage with dark spots, and also birds of both sexes in plumage of a uniform dusky colour, I imagined that they belonged to two distinct species. I was still more confirmed in my impression by the different habits observable in the two. The lighter-coloured birds are very numerous and form large flocks. The birds are so tame that they cannot be frightened away. If you throw a stone at one it avoids it by bending its head or lifting up a leg. If hit, it flies but a short way and alights again. They are so tame that one can hit them with a stick, and even catch them with the hand. When flying they only rise high enough to clear the tops of the bushes and trees. The dark-coloured birds are rare, and keep separate from the lighter variety, and far from human intruders.

“I examined the stomachs of all the specimens obtained: some I found empty; and others contained insects, mostly grasshoppers. In the œsophagus of a male of the dark variety I found a large *Scolopendra*, of a species common in the islands. It would appear therefore that this bird lives chiefly on insects.”—*H.*

Genus PELECANUS.

Pelicans are found in all tropical seas; and *P. fuscus*, the species of the Galapagos, is common along the western shores of Central America. A second species (*P. molinæ*) occurs further to the southward; but its presence in these islands has not yet been noticed.

PELECANUS FUSCUS.

Pelecanus fuscus, Gm. Syst. Nat. i. p. 570; Sundev. P. Z. S. 1871, p. 125.

Hab. Galapagos (*Sundevall*).

Genus SULA.

Gannets are also abundant on the coasts of America, both species found in the islands lying off the shores of Central America. On the Peruvian coast a third species (*S. variegata*) is found; but its range seems to be much more restricted than that of either of the following birds.

SULA LEUCOGASTRA.

Petit Fou, Buff. Pl. Enl. 973.

Pelecanus leucogaster, Bodd. Tabl. Pl. Enl. p. 57.

Dysporus leucogaster, Sundev. P. Z. S. 1871, p. 125.

"*Sula fiber*, Linn." *Scl. & Salv. Nomencl.* p. 124.

Hab. Galapagos (*Sundevall*).

In our 'Nomenclator' Mr. Sclater and I adopted Linnæus's name *fiber* for this species; but on reconsidering the question I think it very doubtful whether this name is really applicable to it; as Sundevall suggests (*Ann. & Mag. N. H.* xix. p. 237, 1847), it more probably belongs to the immature of *S. piscator*. Boddaert's name, *leucogaster*, founded on Buffon's Plate 973, seems to be the first certainly bestowed upon the brown-and-white *Sula* of tropical seas. I therefore follow Sundevall in adopting it.

SULA CYANOPS.

Dysporus cyanops, Sundev. *Phys. Tidskr. Lund*, 1837, pt. 5; *Ann. & Mag. N. H.* 1847, xix. p. 236; et *P. Z. S.* 1871, p. 125.

Hab. Galapagos (*Sundevall*).

Accidentally omitted from our 'Nomenclator Avium Neotropicalium.' This species was noticed off the island of Socorro by Grayson. (*Cf. Lawr. Proc. Bost. Soc. N. H.* xiv. p. 302.)

Genus FREGATA.

Abundant along the western shores of America within the tropics. *Fregata aquila* swarms in the Bay of Panama, and breeds in vast numbers on Pajaros Island, in the Gulf of Fonseca.

FREGATA AQUILA.

Pelecanus aquilus, Linn. Syst. Nat. i. p. 216.

Fregetta aquila, Darwin, Zool. Voy. Beagle, iii. p. 146.

Tachypetes aquilus, Sundev. P. Z. S. 1871, p. 125.

Hab. Galapagos (*Darwin, Sundevall*).

Dr. Habel observed this bird breeding on Tower Island, but he did not secure any specimens.

Genus PHAETON.

Universally distributed throughout the tropics.

PHAETON ÆTHEREUS.

Phaeton æthereus, Linn. Syst. Nat. i. p. 219.

Hab. Tower Island (*Habel*).

Genus ARDEA.

A genus universally distributed. The species found in the Galapagos is the North- and Central-American bird, not the *Ardea cocoi* of the southern continent.

ARDEA HERODIAS.

Ardea herodias, Linn., Baird, B. N. Am. p. 668; Darwin, Voy. Beagle, iii. p. 128; Scl. & Salv. P. Z. S. 1870, p. 323.

Hab. Galapagos (*Darwin*); Indefatigable Island (*Habel*).

“This Heron is the largest bird I collected on the islands, though I saw flying high in the air larger birds with white and cream-coloured bodies and pink wings. They were called Flamingoes by our men¹. I always saw solitary birds of the Heron visiting the ebb tide, the exposed reefs, and the rocky shore, seeking small fish left in the rocky pools. At high tide it will pathetically, with bent head, wade the swamps in pursuit of fish. When flying it utters a hoarse cry. It is somewhat shy, perhaps from being hunted by the visitors from the mainland, to whom it is known as the ‘Garza real,’ and by whom it is esteemed good to eat.”—*H.*

Genus BUTORIDES.

A widely ranging genus, represented by different species in North and South America. The Galapagos bird more closely resembles *B. javanicus*, a species widely ranging over Australia and the Indian and Australian Islands.

BUTORIDES PLUMBEUS.

Ardea plumbea, Sundev. P. Z. S. 1871, pp. 125, 127.

Butorides javanicus, Scl. & Salv. P. Z. S. 1870, p. 323.

Hab. Indefatigable Island (*Habel*); James Island (*Sundevall*).

¹ Doubtless *Phœnicopterus ruber*.

“This Heron cowers motionless and solitary in the daytime in dark shady places, either on cliffs or amongst the mangrove roots on the sea-shore, or else in a decaying tree in a swamp. The neck and head being drawn in, the bird does not look half its real size. At night time its movements are livelier. It utters a kind of shrieking call. It is so tame that it may be caught by the hand or struck with a short stick. It is considered good eating by the inhabitants of the mainland, by whom it is called ‘Quague.’ It feeds on crabs and other crustaceans.”—*H.*

Genus NYCTICORAX.

A genus of wide range, occurring in both continents of America, as well as in the Old World. The species found in the islands is most nearly related to the North-American *N. violaceus*.

NYCTICORAX PAUPER.

Nycticorax violaceus, Darwin, Zool. Voy. Beagle, iii. p. 128 (nec Linn.).

Ardea violacea, L. (var.), Sundev. P. Z. S. 1871, pp. 125, 127.

Nycticorax pauper, Scl. & Salv. P. Z. S. 1870, pp. 323, 327.

Similis *N. violaceo*, sed omnino minor, et præcipue in dorso multo obscurior: dorsi plumis elongatis, non, sicut in *N. violaceo*, griseo marginatis, sed saturate cinereo-nigris unicoloribus: long. tot. 16, alæ 2·2, caudæ 4, rostri a rictu 3·2, tarsi 3·3.

Obs. Hujus *Nycticoracis* specimina duo tantum, quorum neutrum adultum, habemus, sed ad speciem Americæ meridionalis vulgarem vix referenda esse censemus.

Hab. Galapagos (*Darwin, Sundevall*); Indefatigable Island (*Habel*).

“The two birds included under this name in my collection did not seem to me to belong to the same species. There is, however, little discrepancy in their colour, and none in their dimensions. It feeds on crabs. Both my specimens were obtained on Indefatigable Island; but I also saw it on Bindloe.”—*H.*

Genus PHÆNICOPTERUS.

Flamingoes occur both in the Old and the New World. Three species, including the following, are found in America.

PHÆNICOPTERUS RUBER.

Phænicopterus ruber, Linn. Syst. Nat. i. p. 230.

Phænicopterus glyphorhynchus, Gray, Ibis, 1869, p. 442, pl. xiv. f. 5.

Having examined the type specimen of the species described by Mr. Gray as *P. glyphorhynchus*, and also a specimen living in the Zoological Gardens, which appears to be undoubtedly *P. ruber* of N. America, as well as a mounted specimen in the British Museum doubtless belonging to the same species, I am unable to see any grounds for separating the Galapagos bird from *P. ruber*, though Gray places them in different subgenera! I may add that Gray did not recognize the British-Museum specimen as

P. ruber when compiling his paper, and that, so far as I can see, the plates accompanying his paper are of little assistance in differentiating the species.

Genus QUERQUEDULA.

The group of Teals to which the following species belongs is peculiar to South America. If Professor Sundevall's determination of its specific name is correct, the bird is the same as a common Chilian and Patagonian Teal.

QUERQUEDULA VERSICOLOR.

Anas versicolor, Vieill. N. Dict. d'Hist. Nat. v. p. 109 (1816).

Anas maculirostris, Licht. Sundev. P. Z. S. 1871, p. 126.

Hab. Galapagos (*Sundevall*).

Genus DAFILA.

A genus of wide range. The species, too, found in the islands is pretty generally distributed over the whole South-American continent.

DAFILA BAHAMENSIS.

Anas bahamensis, Linn., Sundev. P. Z. S. 1871, p. 126.

Pæcilonetta bahamensis, Darwin, Zool. Vog. Beagle, iii. p. 135.

Dafila bahamensis, Scl. & Salv. P. Z. S. 1870, p. 323.

Hab. Galapagos (*Darwin*); Indefatigable Island (*Habel*).

“This Duck is found in small flocks on the estuaries and small lagoons in the islands, and then in company with other water-birds. It feeds on insects, and probably on other food found at the bottom of the lagoons. It is tame enough to be killed by a blow of a long switch or a stone. On the approach of a person it will not fly, but paddle away a short distance; and when scared will not leave the lagoon entirely, but retire to another part of it. This tameness would indicate that the bird is indigenous to the islands, Ducks, as a rule, being extremely shy. I saw the species on Hood Island, and am convinced of its presence on Charles Island, though I did not see any birds. On Bindloe and Abingdon it is not found.”—*H.*

Genus ZENAIDA.

Zenaida has a wide range in South America, five species (from all of which, however, *Z. galapagensis* is distinct) being found within the limits of that continent. Sundevall places this bird in a separate genus, *Nesopelia*, but its distinctness from *Zenaida* seems to me to be slight.

ZENAIDA GALAPAGENSIS.

Zenaida galapagoensis, Gould, Zool. Voy. Beagle, iii. p. 115, t. xlvi.; Scl. & Salv. P. Z. S. 1870, p. 323; Sundev. P. Z. S. 1871, p. 125.

Columbi-galline des Gallapagoes, Néboux, Rev. Zool. 1840, p. 290; Prév. et Des Murs, Voy. Vénus, Ois. p. 270, Atlas, t. 8.

Nesopelia galapagensis, Sundev. Meth. Nat. Av. Disp. Tent. p. 99.

♂ (Indefatigable Island) vinaceo-chocolatino-cinnamomeus, subtus, præcipue in pectore, clarior: colli lateribus nitente æneo et rosaceo decoratis: oculorum ambitu nudo (in ave viva læte cæruleo) plumis circumdatis nigricantibus: stria utrinque sub oculis albida nigro marginata: dorso medio et tectricibus alarum albo nigroque variis, harum externis in pogonio externo nisi apicibus fere albis, remigibus nigris angustissime albo marginatis: rectricum apicibus cinereis fascia subapicali nigra, in rectricibus mediis angustiore: subcaudalibus et tectricibus subalaribus griseis: rostro nigro: pedibus rubris: long. tota 8·5, alæ 5·3, caudæ 3·0, tarsi 0·9, rostri a rictu 0·95.

♀ mari similis, coloribus paulo dilutioribus.

Hab. Galapagos Islands (*Darwin*); Charles Island (*Néboux*); Indefatigable and Bindloe Island (*Habel*); James Island (*Sundevall*).

This species was also noticed by Dr. Habel in Albemarle, Tower, and Hood Islands, where, however, no specimens were secured.

“The female of this species appears to be a little smaller than the male. The iris in both sexes is dark brown, rather darker in the female, and the feet of a pink colour. The eyelids are a beautiful pale blue. Having been accustomed to find the skins of Central-American Doves very tender and difficult to remove, I was surprised at the toughness of the skin of this species, it being even stronger than the rest of the land-birds of these islands.

“For some years parties have visited these islands to collect the orchilla (*Rocella tinctoria*), a kind of moss growing on the bushes, trees, and even rocks on the windward side of the islands. This Dove being considered by these men a delicate morsel, is caught by them in numbers. It is therefore neither so abundant nor so tame as in former years; nevertheless many were knocked down with switches every morning by our men, as many as three dozen sometimes falling to one man before breakfast, all of which he would devour at one meal! I met with the species on all the islands I visited.”—*H.*

Genus PORZANA.

The section of this genus to which *P. spilonota* belongs has a wide range throughout the continents of America, being found in *P. jamaicensis* from the West Indies and Central America to Chili. The present bird has some resemblance in colour to *P. tabuensis*, a species ranging extensively over the islands of the South Pacific and Australia. *P. tabuensis*, however, may easily be recognized by its much longer tail and red legs.

PORZANA SPILONOTA.

Zapornia spilonota, Gould, Zool. Voy. Beagle, iii. p. 132, t. xlix.

Porzana spilonota, ScL. & Salv. P. Z. S. 1868, p. 456; 1871, p. 323.

♂ (Indefatigable Island) nigricanti-cinereus, fere unicolor, dorso et alis extus rufescente oleagineo perfusus, hypochondriis imis et tectricibus caudæ inferioribus obsolete albo notatis, alis extus, dorso postico et uropygio interdum eodem modo ornatis: iride coccinea: pedibus olivaceo-brunneis: rostro nigro: long. tota 5·0, alæ 2·6, caudæ 1·0, tarsi 0·9, rostri a rictu 0·75.

Obs. Sp. *P. jamaicensis* similis, sed nucha omnino nigricanti-cinerea et maculis dorsi fere obsolete diversa: *P. tabuensi* quoad colores affinis, sed cauda brevi primo visu distinguenda.

Hab. James Island (*Darwin*); Indefatigable Island (*Habel*).

A specimen in Dr. Habel's collection has no spots on the wings and lower back, but does not otherwise differ from the rest of his examples. These spots are somewhat variable, being well defined in some, obsolete in others, and entirely wanting in a few. In none, however, are they so well developed as in *P. jamaicensis*, the nearest ally to the present bird.

"I found this bird only amongst low bushes which sometimes formed the undergrowth of taller trees, in the swampy ground formed by the spring-tide floods in the lower parts of the islands. It has rather a dismal note, like other members of the family. In all the males I examined I observed that the left testicle was grey, while the right one was yellow. All my specimens were collected on Indefatigable Island. I did not meet with it on either Abingdon or Bindloe, where there are no swamps suitable for it."—*H.*

Genus ÆGIALITIS.

A world-wide genus of Plovers. The species mentioned below is found nearly everywhere in both North and South America.

ÆGIALITIS SEMIPALMATA.

Charadrius semipalmatus, Bp. Journ. Ac. Sc. Phil. v. p. 98 (1825).

Ægialitis semipalmata, Baird, Birds N. Am. p. 694; Sci. & Salv. P. Z. S. 1870, p. 323.

Hiaticula semipalmata, G. R. Gray, Zool. Voy. Beagle, iii. p. 128.

Hab. Galapagos (*Darwin*); Indefatigable Island (*Habel*),

"This Plover frequents the sandy beach or the shallow depressions of inland lagoons. On the beach it watches each receding wave, and after its retreat it thrusts its bill into the little holes in the sand, out of which water bubbles, to seize the crustacean hidden therein. It is not so shy as some other wading birds found in these islands; still it is not so tame as to be approached closely. In flying it utters some shrill note of alarm. Its eyelids are of a dark yellow colour"—*H.*

Genus HÆMATOPUS.

Another universally distributed genus, *H. palliatus* being common throughout the shores of the two continents of America.

HÆMATOPUS PALLIATUS.

Hæmatopus palliatus, Temm. Man. d'Orn. ii. p. 532; Scl. & Salv. P. Z. S. 1870, p. 323; Sundev. P. Z. S. 1871, p. 125.

Hab. Galapagos (*Sundevall*); Indefatigable Island (*Habel*).

"This bird is either found in solitary individuals or three or four a short distance apart. They remain perched motionless on the rocks along the shore, or, moving slowly, watch for crabs. They are shy birds, not permitting a near approach. They run a short distance before rising to fly, and in doing so utter the cry *tira, tira*, as the inhabitants of the mainland pronounce it; and from this cry they take their name. They feed on crabs. The eyelid is of a scarlet colour."—*H.*

Genus HIMANTOPUS.

Also widely distributed. *H. nigricollis* is abundant in North America, and southward along the northern parts of South America.

HIMANTOPUS NIGRICOLLIS.

Himantopus nigricollis, Vieill. N. Dict. d'Hist. Nat. x. p. 41; Scl. & Salv. P. Z. S. 1870, p. 323, et 1873, p. 453.

Hab. Indefatigable Island (*Habel*).

As already mentioned in the last reference given above, it is this species, and not the more southern *H. brasiliensis*, that occurs in the Galapagos.

Concerning it Dr. Habel says, "the Black-necked Stilt is to be met with in flocks of four or five, always in company with other wading birds, frequenting the lagoons in search of its food, which consists of crabs and other crustaceans. Next to *Numenius hudsonicus*, it is the shyest bird on the islands, not permitting one to approach. Its red legs, white breast, and black wings give it a very neat appearance."—*H.*

Genus STREPSILAS.

One of the most widely distributed genera of birds, *S. interpres* being probably found on the shores of all parts of the world.

STREPSILAS INTERPRES.

Tringa interpres, Linn. Syst. Nat. i. p. 248.

Strepsilas interpres, Darwin, Zool. Voy. Beagle, iii. p. 132; Scl. & Salv. P. Z. S. 1870, p. 323.

Hab. Galapagos (*Darwin*); Indefatigable and Bindloe Islands (*Habel*).

"This bird is found in flocks of varying numbers either on the rocks, on the beach, or in company with other waders in the lagoons. Like the other aquatic birds it is somewhat shy, and, not allowing of a close approach, is very vigilant. Crabs and small crustaceans seem to be its chief food."—*H.*

Genus CALIDRIS.

Like *Strepsilas*, to be found on almost every shore.

CALIDRIS ARENARIA.

Scolopax calidris, Linn. Syst. Nat. i. p. 245.

Calidris arenaria, Cuv. ; ScI. & Salv. P. Z. S. 1870, p. 323.

Hab. Bindloe Island (*Habel*).

“The only specimen of the Sanderling secured on these islands was shot on Bindloe sand-beach, where it was found associating with other wading birds. From these its lighter colour distinguished it, as well as its smaller size. Our tents being pitched on the shore, these birds soon became shy ; and this one was killed by a long shot.”—*H.*

Genus HETEROSCELUS.

This genus, as restricted, comprises one or two species which are found on the coasts and islands of the Pacific Ocean and along the western shores of the continent of North America.

HETEROSCELUS INCANUS.

Ash-coloured Snipe, Lath. Syn. iii. p. 154 (Eimeo and Palmerston Islands) ; undè

Scolopax incana, Gm. S. N. i. p. 658.

Heteroscelus brevipes, Baird, Birds N. Am. p. 734.

Totanus fuliginosus, Gould, Zool. Voy. Beagle, iii. p. 130 ; Gray & Mitch. Gen. B. iii. t. 154.

Totanus brevipes, ScI. & Salv. P. Z. S. 1870, p. 323 (ex Vieill.).

Actitis incanus, Finsch & Hartl. Orn. Centr.-Polyn. p. 182.

Hab. Galapagos (*Darwin*) ; Indefatigable and Abingdon Islands (*Habel*).

There can be no doubt, I think, that G. R. Gray (Hand-l. iii. p. 45) was right in referring this species to the Ash-coloured Snipe of Latham's Synopsis. The bird has a wide range, being found throughout the Pacific. The particulars of its distribution are fully given in Finsch and Hartlaub's work quoted above.

“This bird was obtained with difficulty, partly because of its shyness, partly because it seeks the outlying reefs, seldom coming inshore. On the rocks it remains stationary, moving but little in search of its food, which consists of crabs, which are seized with a sudden dart of its beak. One of my two specimens was secured on Indefatigable Island, the other on Abingdon, thus showing its wide distribution.”—*H.*

Genus TRINGA.

This genus is found on the sea-coasts of all parts of the world. The species occurring in the Galapagos is identical with a common North-American bird, which in winter migrates into South America, reaching far beyond the equator.

TRINGA MINUTILLA.

Tringa minutilla, Vieill. ; Darwin, Zool. Voy. Beagle, iii. p. 131 ; Sci. & Salv. P. Z. S. 1870, p. 323.

Hab. Galapagos (*Darwin*); Indefatigable Island (*Habel*).

"I only obtained two females of this species, indicating its scarcity on these islands. I noticed that the legs of one of these specimens were grey, while those of the other were green. One bird I shot in a lagoon that was drying up. It remained alone after all the other waders had departed, thus proving to be less shy than the others. The food of this species appears to consist of insects as well as crabs; for in one I found the former, and in the other the latter food."—*H.*

Genus NUMENIUS.

Also a world-wide genus, *N. hudsonicus* ranging from the arctic regions of North America to Cape Horn.

NUMENIUS HUDSONICUS.

Numenius hudsonicus, Lath. Ind. Orn. ii. p. 712 ; Sci. & Salv. P. Z. S. 1870, p. 323.

Hab. Indefatigable Island (*Habel*).

"This Curlew is the shiest bird on the islands, permitting of no near approach. No sooner does it get sight of a person, which it does at a great distance, and far out of reach of a gun, than it utters its shrill call and flies away. It thus alarms the other waders frequenting the beach or drying lagoons, inducing them to take flight also. It can only be approached under cover of bushes. Its food consists of crabs and other crustaceans. On the mainland it is known as el Piloto (the Pilot), and is supposed to indicate by its call a change of weather. I found it on all the islands I visited."—*H.*

Genus ANOUS.

Anous is found in all tropical seas, *A. stolidus*, by far the commonest of its species, ranging wherever the genus is found.

ANOUS STOLIDUS.

Sterna stolidus, Linn. Syst. Nat. i. p. 227.

Megalopterus stolidus, Darwin, Voy. Beagle, iii. p. 145.

Anous stolidus, Sundev. P. Z. S. 1871, p. 125.

Hab. Galapagos (*Darwin*, *Sundevall*); Dalrymple Rock, Chatham Island (*Kellett & Wood*).

Genus LARUS.

Larus is found throughout the world, frequenting the sea-coast. The species found in the Galapagos is peculiar to those islands, and belongs to a section of the genus called *Blasipus* by Bonaparte. Its nearest allies are found on the western coasts of North and South America.

LARUS FULIGINOSUS. (Plate LXXXVII.)

Larus fuliginosus, Gould, Zool. Voy. Beagle, iii. p. 141; Sci. & Salv. P. Z. S. 1870, p. 323, et 1871, p. 574; Sundev. P. Z. S. 1871, p. 125.

Obscure cinereus, capite undique obscuriore; subtus pallidior, abdomine imo albicanti-griseo: secundariorum apicibus et tectricibus supracaudalibus albidis, his griseo tinctis: remigibus 1°, 2°, 3° omnino nigris, 4°, 5°, 6° griseo terminatis; reliquis griseo-nigris, apicibus paulo pallidioribus: cauda dorso concolori, rectricibus duabus utrinque externis albidis: macula supra et infra oculos alba, ciliis rubris, iride brunnea: rostro et pedibus rufescenti-nigris: ore ruberrimo: long. tota 18·0, alæ 13·8, caudæ 5·9, tarsi 2·3, rostri a rictu 2·5.

♀ *juv.* fuliginosa, subtus paulo dilutiore: alarum tectricibus pallide fusco marginatis: remigibus et tectricibus nigris: rostro et pedibus nigris: iride obscure brunnea.

Hab. Galapagos (*Darwin*); Indefatigable and Abingdon Islands (*Habel*); Charles and Indefatigable Islands (*Sundevall*).

The nearest allied species to *Larus fuliginosus* is *L. modestus* of the coasts of Peru and Chili. We have already pointed out the differences between these birds in our paper on South-American Laridæ (P. Z. S. 1871, p. 573). They consist in the Galapagos bird having a stouter bill and a well-marked blackish hood. The figure now given, compared with the plate of *Larus modestus* in Fraser's 'Zoologia Typica' (t. 69), will, I trust, prevent further confusion respecting these species.

"A pleasing bird, which does not fly away, but on the contrary approaches one with a friendly greeting call-note. They sometimes become troublesome, as they feed on meat hung up to dry, and are driven off only to return again. They take little notice of stones thrown at them, unless actually hit. They appear to be always quarrelling and chattering with each other over their food, each one trying to take the morsels from another. When I shot a bird the others all circled round me, whether in grief or rage I could not say. They form more or less numerous groups, chiefly frequenting the sea-shore, and in smaller numbers they visit the lagoons. This Gull feeds on crabs and any dead animal substance. Amongst a large flock of slaty-coloured birds some few of a brown colour will be seen. I was inclined to look upon these as varieties, being at a loss how else to account for them. These Gulls fly but a short way, and do not appear to pass from island to island. I did not observe any on Hood's island."—*H.*

Genus CREAGRUS.

This genus seems to have been suggested by Bonaparte in his criticism of Herr Bruch's first paper on Laridæ, published in the 'Journal für Ornithologie' in 1853. Bonaparte writes, "Le sixieme genre de M. Bruch est coupé par moi en deux: chacune de ces espèces formant le type d'un genre séparé, *Xema* restant à *sabini*, Leach, pour laquelle il fut créé, et *furcatus*, Néboux (non Lesson), étant celui de *Creagrus*, Bp."

(Rev. Zool. 1855¹, p. 14). *Creagrus*, as a genus, differs but slightly from *Xema*, both having a deeply forked tail. The former, however, is a more robust form, and has the nostril situated rather nearer the point of the bill. In coloration *Creagrus* wants the black ring which encircles the hood of *Xema*. I doubt whether, in a well-considered classification of the Laridæ, the two genera could be maintained as distinct.

CREAGRUS FURCATUS.

Mouette à queue fourchue, Néboux, Rev. Zool. 1840, p. 290.

Larus furcatus (Néboux), Prév. et Des Murs, Voy. Vénus, v. Ois. p. 277, Atlas, t. x.

Xema furcatus, Bruch, J. f. Orn. 1853, p. 103.

Creagrus furcatus, Bp. Rev. Zool. 1855, p. 14.

Supra cinereus: capite toto et colli dimidio antico undique fuliginoso-nigris: plaga frontali, scapularium margine externo, tectricibus alarum internis, cauda et corpore subtus albis: remigum 1ⁱ, 2ⁱ, 3ⁱ, 4ⁱ pogoniis externis cum pogoniorum internorum parte interiore et apicibus nigris: rem. 3^o et 4^o ad basin griseis; 5^o et 6^o extus griseis, parte apicali nigra; 4^o, 5^o, 6^o plaga apicali alba præditis: rostro et pedibus rubris: long. tota 23·0, alæ 16·0; caudæ rectr. med. 4·7, rectr. ext. 8·0; tarsi 1·9, digit. med. cum ung. 2·0.

Hab. Dalrymple Rock, Chatham Island (*Kellett & Wood*).

The above locality is assigned to a single adult specimen of this rare species in the British Museum. It was obtained with other Galapagos birds during the voyage of H.M.S.S. 'Herald' and 'Pandora.' This locality is given with such precision that I think there can be little doubt as to its correctness. The original example of this Gull, the only other known, was obtained by Néboux, the surgeon of the French frigate 'Vénus,' but is said to have been shot at Monterey, in California. Though it is possible that the species may occur both in the Galapagos and on the mainland, it is also possible an error has been made as regards one of the localities assigned to it. Now as the species has never been seen by any of the many collectors of the United States, and as several of the birds obtained during the voyage of the 'Vénus' have wrong localities assigned to them, such as *Calliste ruficervix* from Guatemala instead of Columbia, and, I believe, *Zonotrichia coronata* from the Galapagos (described under the name *Z. galapagoensis*) instead of California, I am inclined to think the Californian locality an erroneous one, and that this well-marked species must be added to the peculiar fauna of the Galapagos archipelago.

The British-Museum specimen has the division between the dark hood of the head and neck more clearly defined from the white of the breast than is shown in the plate above quoted, where the lower neck is suffused with a pale shade of grey. I have, however, no doubt as to the identity of the specimen, and believe this difference is to

¹ Separate copies of this paper are dated 1854; but the paper itself was published, with different pagination, in January 1855. Gray gives the former date for the introduction of the genus; but the latter must be considered correct.

be attributed to age, or perhaps to the not too accurate colouring of the plate. There is shown too, in the latter, a white spot near the eye, which I have not been able to trace in the Museum example.

Genus PROCELLARIA.

An oceanic genus of nearly universal range.

PROCELLARIA TETHYS. (Plate LXXXVIII. fig. 2.)

Procellaria tethys, Bp. Notes Orn. p. 92, et Consp. ii. p. 197.

Fuliginoso-nigra: tectricibus alarum mediis et corpore subtus brunnescentioribus: tectricibus subalaribus fuliginoso-brunneis, tectricibus caudæ superioribus elongatis, omnino albis; uropygio dorso concolori; rostro et pedibus nigerrimis: long. tota 6·0, alæ 5·2, caudæ rectr. ext. 2·4, rectr. med. 2·2, tarsi 0·85, dig. med. ·70, rostri a rictu ·65.

Obs. *P. pelagicæ* affinis, sed tectricibus caudæ magis elongatis et apicibus omnino albis, alarum tectricibus mediis brunnescentioribus, cauda sensim furcata, tectricibus subalaribus et axillaribus omnino fuliginosis distinguenda.

There is a specimen of this species in the British Museum, marked in Bonaparte's handwriting "*P. tethys*, Bon.", and referred to by him in the 'Conspectus.' It bears the mark 193 *a*; but no record of its origin or locality is extant.

As it answers to Bonaparte's description, and agrees with the type in the Paris Museum (which I have lately examined), I have no doubt it belongs to the species obtained by Néboux in the Galapagos Islands. The species seems to be little known, no specimen having come under Dr. Coues's observation when engaged in compiling his monograph of this family.

Mr. Gray refers this species to *P. pelagica* in his 'Hand-list' (iii. p. 103), having apparently overlooked the differences which distinguish it. The plate taken from the British-Museum specimen, will, I trust, tend to establish *Procellaria tethys* in its rightful position.

Genus ŒSTRELATA.

This genus of Procellariidæ has a wide range in both the Atlantic and Pacific Oceans, the species being most numerous in the southern temperate zone. In the Atlantic a single species ranges as far north as the Canaries, where *Œ. mollis* is found. In the Pacific the Galapagos Islands appear to be the limit of the northern range. The species there found, which I describe below, has its nearest ally in a West-Indian Petrel which has strayed to the coasts of Europe.

ŒSTRELATA PHÆOPYGIA, sp. n. (Plate LXXXVIII. fig. 1.)

Supra brunnescenti-nigra fere unicolor, dorsi plumis cinereo stricte marginatis; fronte, loris, corpore subtus, pagina alarum inferiore (nisi in margine), et crisso albis: remige primo omnino nigro, remigibus reliquis in dimidio basali pogonii interni albis: rectricibus dorso concoloribus, in pogonio interno basin versus albis; tarsi et pedum dimidio

antico carneis; harum dimidio postico et rostro nigris: long. tota 16·0, alæ 12, caudæ 5·5, tarsi 1·5, rostri a rictu 1·65.

Obs. *Æ. hæsitatæ* affinis, sed tectricibus supracaudalibus dorso concoloribus nec albis distinguenda.

There are two specimens of this species in the British Museum, both obtained by Captain Kellett and Lieut. Wood in the Galapagos, one of them being labelled as coming from Chatham Island. These skins differ from a mounted specimen of *Æ. hæsitata* in the British Museum, from Haiti, in having the upper tail-coverts of the same colour as the back, and in the dark colour of the crown being connected with that of the back by the feathers of the hind neck being tipped with the same dark colour. There is no other species to which, so far as I am aware, this bird is at all nearly allied. I have little doubt but this Petrel is the small "Albatross" spoken of by some of the early visitors to these islands.

Genus SPHENISCUS.

The Penguins are restricted in their range to the southern hemisphere. The peculiar species of the Galapagos has probably the most northern habitat of any member of the family. Its nearest ally is *S. magellanicus*, from the Straits of Magellan and the Falkland Islands.

SPHENISCUS MENDICULUS. (Plate LXXXIX.)

Spheniscus mendiculus, Sundeval. P. Z. S. 1871, pp. 126, 129.

Niger, subtus albus: capitis latera cum gula nigro-fusca, mento albo: linea superciliaris angusta, alba, a macula lori majore incepta, aurem cingens, in jugulo supremo cum pari conjuncta: cervix et colli latera nigricantia: color nigricans jugulum ambit ibique torquem format albedinem juguli in fascias duas separantem: linea infra lateralis nigra ut in *S. demerso* linea laterali interjecta alba a nigridine dorsali separata et in jugulo medio cum pari arcuatim conjuncta: ala subtus nigra cum vitta longitudinali minus definita, albida, in carpo abbreviata: rostrum nigrum, maxilla inferiore lutea (vel aurantia) apice ante nares nigra, limite definito: pedes (sicci) fusci (*Sundeval*): long. tota 17·5, alæ (humero excluso) 4·5, tarsi 1·4, dig. med. cum ung. 2·4, rostri a rictu 2·6.

Hab. James Island (*Sundeval*).

The above description is the original one given by Professor Sundeval in the 'Proceedings' for 1871. He there compares the species to *S. demersus* of South Africa; but its relationship, so far as is indicated by the distribution and number of the dark and white bands on the neck are concerned, show that it has greater affinity with *S. magellanicus* of the Straits of Magellan and the Falkland Islands, where these marks, in a more decided form, are quite similarly distributed, except that in the Galapagos bird the chin is white. From *S. magellanicus* *S. mendiculus* differs in its longer and more slender bill, three fourths of the base of which is yellow instead of black, and in its

generally smaller size, as well as in the colour of the chin, already mentioned. On the west coast of South America another species is found, *S. humboldti*, which differs both from *S. magellanicus* and *S. mendiculus* in having only one white band crossing the throat instead of two. In this respect the Chilian bird agrees closely with the true *S. demersus* of the Cape of Good Hope, from which it only differs in having the superciliary white line narrower.

Dr. Elliott Coues, in his monograph of the Spheniscidæ, published in the 'Proceedings of the Academy of Natural Sciences of Philadelphia' (1872, p. 211), unites the Chilian bird with the true *S. demersus* of the Cape of Good Hope, and treats *S. magellanicus* as a variety of the same species. This view does not, in my opinion, give the real relationship these birds bear to one another. *S. magellanicus* in its adult dress can at once be distinguished from either *S. demersus* or *S. humboldti* by the additional black band which crosses the throat; and this also forms a distinctive character in *S. mendiculus*. Dr. Coues likewise says that *S. magellanicus* is found in the same localities as *S. demersus* (in which he includes *S. humboldti*). My experience, however, shows that *S. magellanicus* is entirely replaced on the west coast of America by *S. humboldti*, and is restricted in its range to the Falklands and the extreme south of South America.

As regards the retention of the name *humboldti* (given by Meyen to the Chilian Penguin), I may say that I do so in preference to adopting the name *chilensis*, supposed to have been bestowed by Molina on the same species. Molina's species are too inadequately described to warrant his names being substituted for others about which no doubts hang. Moreover I question the propriety of any deduction which might be made from the signification of the name *chilensis* standing in the place of a good description.

The figure is taken from a typical specimen brought to Europe by the Swedish frigate 'Eugenie,' and now in our collection.

VII. CONCLUDING REMARKS.

Before concluding this paper a few conjectural remarks on the process by which these islands have become tenanted with bird-life may not be out of place.

Considering their purely volcanic nature, it cannot reasonably be doubted that these islands have always been islands since they emerged from the sea. Such is Mr. Darwin's view; and it is fully indorsed by Dr. Hooker and others. The birds that are now found, being related to American birds, must have emigrated thence and become modified by the different circumstances with which they became surrounded. The oldest immigrants seem to be indicated by their generic difference from their continental allies, the more modern comers by their merely specific distinctness, and the most recent by their identity with birds now found on the adjoining continent. On this view the islands were first taken possession of by individuals of the parent stock of *Certhidea* and *Conirostrum*, *Geospiza* and *Guiraca*, *Camarhynchus* and *Neorhynchus*. Then came perhaps the ancestors of *Buteo*; after these followed those of *Mimus*, *Pyrocephalus*, and *Myiarchus*,

Strix and *Asio*, *Zenaida*, *Larus*, and *Spheniscus*. Then those of *Dendræca*, *Progne*, *Butorides*, *Nycticorax* and *Porzana*, and, finally, *Dolichonyx orizivora*, *Ardea herodias*, and the Ducks, Flamingo, Gannets, Plovers, and Sandpipers, though of these last a constant stream of immigrants may have been maintained from the earliest times. It must be remembered, however, that no precise order of immigration can be absolutely laid down, even approximately; for one term in the proposition is an absolutely unknown quantity. We know nothing of the rate of change that has taken place in any one species. Outward circumstances may have acted upon one species so as to leave it little changed in a given time, whilst in the same time another species may have assumed distinctive generic characters. Viewing the very peculiar physical characters possessed by these islands when contrasted with the neighbouring American shores, it would seem reasonable to consider that the rate of change demanded of an immigrant species would be high; consequently the origin of the islands need not be dated back to a more distant period than seems indicated by their volcanic origin. But I am writing of the Birds alone; other forms of life found in these islands present far more complex problems for solution, into which I am not prepared to enter.

DESCRIPTION OF THE PLATES.

PLATE LXXXIV.

Outline Chart of the Galapagos Islands, taken from the Admiralty Chart, No. 1375.
The dotted line shows Dr. Habel's route.

PLATE LXXXV.

Camarhynchus variegatus, p. 489: fig. 1, ♂; fig. 2, ♀.

PLATE LXXXVI.

Camarhynchus habeli, p. 490: fig. 1, ♂; fig. 2, ♀.

PLATE LXXXVII.

Larus fuliginosus, p. 505: fig. 1, adult; fig. 2, immature.

PLATE LXXXVIII.

Figs. 1 & 3. *Æstrelata phæopygia*, p. 507. Fig. 2. *Procellaria tethys*, 507.

PLATE LXXXIX.

Spheniscus mendiculus, p. 508.

All the figures are taken from specimens in the collection of Mr. Godman and myself, except those of *Æstrelata phæopygia* and *Procellaria tethys*, the originals of which are in the British Museum.



J G Keulemans lith.

M & N Hanhart imp

CAMARHYNCHUS VARIEGATUS Fig 1 ♂ 2 ♀





J.G. Keulemans lith.

M&N Hanhart imp.

CAMARHYNCHUS HABELI Fig 1 ♂ 2 ♀





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J. G. Keulemans lith.

M. M. Harhart imp.

LARUS FULIGINOSUS, Fig. I. ad. 2. Jr.





J. G. Keulemans lith.

M. & N. Harhart imp.

1. 3. CESTRELATA PHÆOPYGIA. 2. PROCELLARIA TETHYS.





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J. G. Keulemans del.

M. H. Hartert sculp.

SPHENISCUS MENDICULUS.

