

DESCRIPTION OF PLATE VIII.

Fig. 1. *Idiops kochii*, ♂, p. 103.

- a. Fore-right view of cephalothorax and falces.
- b, c. Palpus in two positions.
- d. Profile, without legs or palpi.
- e. Natural length of Spider.

2. *Idiops sigillatus*, ♂, p. 105.

- a. Fore-right view of cephalothorax and falces.
- b. Underside of cephalothorax, showing maxillæ, labium, and sternum.
- c, e. Palpus in two positions.
- d. Leg of first pair.
- f. Hinder portion of abdomen.
- g. Profile, without legs or palpi.
- h. Natural length of Spider.

3. *Idiops syriacus*, ♀, p. 107.

- a. Fore-right view of cephalothorax and falces.
- b. Profile, without legs or palpi.
- c. Natural length of Spider.

4. *Idiops meadii*, ♂, p. 152.

- a. Fore-right view of cephalothorax and falces.
- b, c. Palpus in two positions.
- d. Leg of first pair.
- e. Profile, without legs or palpi.

5. *Idiops blackwallii*, ♂, p. 154.

- a. Fore-right view of cephalothorax and falces.
- b, c. Palpus in two positions.
- d. Leg of first pair.
- e. Profile, without legs or palpi.
- f. Underside of tarsus and metatarsus.

6. *Idiops thorellii*, ♂, p. 156.

- a. Leg of first pair.
- b. Fore-right view of cephalothorax and falces.
- c, e. Palpus in two positions.
- d. Tarsal claws.
- f. Natural length of Spider.
- g. Profile, without legs or palpi.

March 24, 1870.

Dr. E. Hamilton, V.P., in the Chair.

Mr. P. L. Sclater exhibited a coloured drawing, forwarded to him by Dr. S. Salvadori of Turin, C.M.Z.S., representing a bird which that naturalist had proposed to describe as a new genus and species of Megapodes, but which was evidently the remarkable Pigeon recently named by Mr. Gould *Otidiphaps nobilis* (Ann. N. H. 4th series, vol. v. p. 62, 1870; cf. P. Z. S. *antedà*, p. 4). Dr. Salvadori had received the specimen in a box of skins bought at Singapore, but stated to have been brought from Macassar. All the other birds in this box (fifty-eight in number, belonging to forty different

species) were well-known inhabitants of New Guinea and the neighbouring islands, with the single exception of *Erythrura trichroa* (Kittl.), not hitherto recorded as a Papuan species.

A third letter* on the ornithology of Buenos Ayres, addressed to the Secretary by Mr. W. H. Hudson, C.M.Z.S., was read:—

“There are four Woodpeckers met with in this country [Buenos Ayres]. Two of these (*Picus mixtus* and *Chrysoptilus chlorozostus*) you have seen in my collections. To both these birds the natives have given the vulgar name ‘Come-palo,’ or ‘Woodeater.’ Both of these species are quite common in the places they frequent, and are occasionally seen in the thickets south of the Rio Salado; but this is the extreme southern limit of their range, and they prefer the Sayus forests bordering on the Rio de la Plata. *Chrysoptilus chlorozostus* is sometimes seen to alight on the ground, apparently for the purpose of feeding on worms and ants. Its cries are, when the bird is excited, loud, rapid, and shrill; at other times it modulates them to notes exceedingly soft and sorrowful.

“The third species (the *Carpintero blanco*, or White Carpenter†) affords another illustration of the influence of the riverine wood in introducing new species from the north to this country; for this bird, which is a native of the northern states of La Plata, is occasionally found within a few miles of the city of Buenos Ayres, though never, to my knowledge, south of it. Probably the divergence from the typical mottled colours of the Woodpeckers is greater in this species than in any other. I am not acquainted with its habits.

“The fourth species is the ‘*Carpintero*,’ more widely distributed and better known than the other members of the genus to which it belongs, and also of great interest in reference to the erroneous account of its habits in Mr. Darwin’s work, which makes it worthy of particular attention. However close an observer a naturalist may be, it is not possible for him to know much of a species from seeing perhaps one or two individuals in the course of a rapid ride across the pampas. Certainly, if Mr. Darwin had truly known the habits of the bird, he would not have attempted to adduce from it an argument in favour of his theory of the origin of species. In Chap. VI. of his well-known work on this subject the author speaks of the altered habits, caused by change of habitat and other extraneous circumstances, and infers that it would be an easy matter for natural selection to step in and alter an animal’s structure so as to make a new species of it, after its habits have been so altered. He then proceeds to ask whether ‘there can be a more striking instance of adaptation given than that of a Woodpecker for climbing trees and for seizing the insects in the chinks of the bark;’ and, in reference to this, states that there is a Woodpecker inhabiting the plains of La Plata, ‘where not a tree grows,’ and which is conse-

* For Mr. Hudson’s previous letters see *antea*, p. 87 et p. 108.

† [*Leuconerpes dominicanus*.—P. L. S.]

quently a 'Woodpecker which never climbs a tree' (Origin of Species, 4th ed. ch. vi. pp. 212, 213).

"The perusal of the passage quoted by one acquainted with the bird referred to and its habits might induce him to believe that the author had purposely wrested the truth in order to prove his theory; but as Mr. Darwin's 'Researches' were written long before the theory of natural selection was conceived, and abound in similar misstatements when treating of this country, the error must be attributed to other causes. The facts are, that besides orchards, and groves of willow, poplar, &c., which have been planted wherever the plains are settled, there is also the continuous wood, which I have already described, growing on the shores of the La Plata.

"South of Salado River the numbers of wild trees have given a name to a large department of this province. There is also in the vicinity of Dolores, 150 miles south of Buenos Ayres city, a very extensive forest. All these woods are frequented by the *Carpintero*, where he may be observed climbing the trees, resting on his stiff and frayed tail-feathers, and boring the bark with his bill as other Woodpeckers do. But his favourite resort is to the solitary *Ombu*, a tree found over a great extent of the plains of Buenos Ayres. This tree attains a considerable size; there is one situated within fifty paces of the room I am writing in that has a trunk which measures at a height of 3 feet above the ground 30 feet in circumference. This very tree was for years a breeding-place for several *Carpinteros*, and still exhibits on its trunk and larger branches scars of old wounds inflicted by their bills. The wood of the *Ombu* is very soft; and the *Carpintero* invariably bores for breeding where it is green and sound. The hole it forms runs horizontally about 9 inches into the tree, then slants upward a few inches more, and at the end of this passage a round chamber is excavated to receive the eggs.

"The *Carpintero* frequently lights on the ground, where it is seen to feed on ants and larvæ, and is sometimes found several miles distant from any trees. This, however, is very rare; and it is on such occasions always apparently on its way to some tree or trees in the distance. It very rarely takes a long flight, but travels by very easy stages. These circumstances have led to its being described as living exclusively on the ground. Outlying the regions abounding in trees, and which I have described as the habitat of the *Carpintero*, there are vast tracts in the southern and western portions of Buenos Ayres where, in truth, 'not a tree grows;' but in these regions the *Carpintero* is never seen. It is not only the erroneous account of this bird's habits that makes Mr. Darwin's mention of it peculiarly unfortunate, but also because this bird rather affords an argument against the truth of Mr. Darwin's hypothesis. Mr. Darwin describes it as a perfect Woodpecker, not only in conformation, but in its colouring, undulatory flight, and shrill obstreperous cries. It is plain, then, that natural selection has left it unaltered; and is it not reasonable to suppose that, if there was such an agency in nature, it would have done something to alter this species, placed as it is in a

situation so badly adapted for its structure and habits? But, in truth, natural selection has done absolutely nothing for our Woodpecker. Its colours are not dimmed, nor its loud notes subdued; but even when it traverses the open country it calls about it the enemies from which it has little chance to escape. Natural selection has not endowed it, for its safety, with the instinct of concealment, so common in the true pampas birds. Its peculiar flight also, so admirably adapted for gliding through the forest, here only excites the rapacious birds to pursuit. In fact, the residence of this species in a region of which the conditions seem inimical to its preservation, so far from modifying, seems rather to have intensified its characteristics. Compared with the other Woodpeckers of this portion of South America, in structure, size, colour, voice, and flight, it is the type of the genus. The habit of occasionally perching on the ground it possesses in common with other species; but it never roosts on the ground, like the true pampas birds; never builds a nest or burrows in banks, like the Patagonian Parrot; nor ventures on to those vast and treeless plains that border on its habitat. Scarcity of provisions and seeking for trees better adapted for breeding, with, perhaps, other reasons, have probably led to the distribution of this species over a great extent of country.

"Twenty years ago, which is as far back as my recollection extends, the *Carpintero* was rather a common bird; but it has now become so very rare, that for the last four years I have met with only three individuals."

Mr. Tegetmeier exhibited living specimens of the Axolotl (*Siredon mexicanus*), one of which (fig. 1, p. 161) had undergone the metamorphosis described by M. Aug. Duméril in the 'Annales des Sciences Naturelles' for 1867.

This animal had hitherto been regarded as a perennibranchiate amphibian, as it breeds freely in the larval state, and in Mexico appears to be only known in that condition, although many naturalists have suspected it to be the larva of a large Salamander.

The specimens exhibited were hatched in the summer of 1868, and kept under similar conditions, without any change taking place beyond a steady increase of growth, during the succeeding winter and summer of 1869. In the autumn one only out of five began to change; the external gills disappeared, the jaws became much more pointed, and the skin assumed a singularly mottled appearance. The animal did not leave the water, but, when the temperature was warm, usually breathed by standing erect against the side of the aquarium and elevating the nostrils above the surface, respiration being effected by the very rapid movement of the skin of the lower jaw. During cold weather it usually remained submerged, rising at intervals to the surface to breathe.

Mr. Tegetmeier also exhibited some microscopic slides, on which were mounted portions of the excessively thin cuticle of the feet of the animals, that had been shed like a glove, the skin of the toes being partly inverted.

Fig. 2. *Siredon mexicanus*, in normal state.Fig. 1. *Siredon mexicanus*, metamorphosed.

The following papers were read :—

1. Notice of the arrival in the Society's Gardens of living Specimens of two newly described Species of *Phasianidæ*.
By P. L. SCLATER, M.A., Ph.D., F.R.S., Secretary to the Society.

(Plates XIV., XV.)

Since the last Meeting, the Society's collection of living Phasianidæ has been enriched by the acquisition of the original typical specimens of two very fine species of the genera *Lophophorus* and *Ceriornis*, which have been lately described as new by Dr. Jerdon. The discovery of these remarkable additions to the list of known Pheasants is a matter of so much interest that I venture to offer to the Meeting a few remarks upon the subject, in connexion with the drawings of these splendid birds which I now exhibit.

In October last Dr. T. C. Jerdon, the well-known Indian naturalist, addressed to me a letter from Shillong, a new sanitarium on the Khasya Hills in Upper Assam, stating that he had obtained from the hill-ranges in the neighbourhood of Suddya a skin of a Tragopan (*Ceriornis*), distinct from either of the well-known Indian species, but which he believed might be *C. temminckii* of China, and had seen a living example of an Impeyan from the same Hills, which he regarded as probably new to science, and proposed to call *Lophophorus sclateri*. This letter was accompanied by an enclosure upon the same subject for publication in 'The Ibis,' which was duly forwarded to the editor of that journal, and appeared in the last number*.

In a subsequent communication, received through Dr. J. Anderson, our excellent correspondent and honorary agent at Calcutta, Dr. Jerdon informed me that, in the interests of the Society, he had begged of Major Montagu, of the Bengal Staff Corps, the fortunate possessor of the new Impeyan, the living bird in question, as also a living example of the so-called *Ceriornis temminckii*, in the same gentleman's possession, and had forwarded them to Calcutta to Dr. Anderson for transmission to the Society. Dr. Jerdon likewise stated that, since he last wrote, having had an opportunity of consulting authorities, he had convinced himself that the *Ceriornis* was distinct from *C. temminckii*, and, in a notice sent to the 'Journal of the Asiatic Society of Bengal,' had proposed to call it *Ceriornis blythii*.

It is to Major Montagu, therefore, that the Society are primarily indebted for these two splendid birds, which reached us in safety on the 12th inst., though our best thanks are likewise due to Dr. Jerdon and Dr. Anderson for their kind assistance in the matter, and to Mr. William Jamrach, who most liberally undertook to convey them home, under his personal care, and has delivered them to us in excellent condition.

* See 'Ibis,' 1870, p. 147, and J. A. S. B. 1870, p. 61.



M & N. Hanhart imp

LOPHOPHORUS SCLATERI.





J. C. Keulemans lith.

M & N Hanhart imp

CERIORNIS BLYTHII.

The new Impeyan *Lophophorus sclateri*, as will be seen by the figure which I now exhibit (Plate XIV.), is at once distinguishable from the *L. impeyanus* of the Himalayas, as also from the more recently discovered *L. lhuysi** of Szechuen by well-marked characters. The sides of the head are widely naked, and covered with bright blue skin. The top of the head is covered with short curly feathers of a bright green; and there is no appearance at all of the remarkable crest whence the genus has obtained its name, though it is just possible that this may be developed at a later period, for other indications lead me to believe that our specimen is not quite adult. The general colour of the plumage is velvety black, above glossed with green, and with coppery on the nape and wing-coverts. The lower back and upper tail-coverts are pure white, with some longitudinal black shaft-streaks. The tail-feathers are dark chestnut, terminated, I believe, by a narrow white end-band—although this is not distinguishable in our specimen, from the imperfect state of the tail; but it is mentioned by Dr. Jerdon, and there were some indications of it when the example first arrived. The bill is long and curved, and the feet large, as in the other Impeyans. The beak is of a yellowish horn-colour, the legs and feet dark horn-colour, the irides dark brown.

There can be no doubt, I think, that the present bird belongs to a species perfectly distinct from the two previously known members of the genus, and forms a third of this magnificent group of Phasianidæ.

Our example of this bird, which is the only individual of the species yet obtained, was received from the Mishmi Hills in Upper Assam, the same locality that has produced the remarkable mammal *Budorcas taxicolor*.

Not less easily distinguishable from its congeners hitherto known is *Ceriornis blythii*, of which I likewise exhibit a figure (Plate XV.). Amongst the described species of the genus it most nearly resembles *Ceriornis caboti*, being below mesially of a nearly uniform colour, somewhat as that species, and not distinctly ocellated as in the three other members of the genus. It is, however, to be recognized at first sight by the splendid golden yellow of the naked face and throat. It is not very easy to describe a living bird with accuracy; but no description of this species having yet appeared in this country, I have drawn up the subjoined diagnosis, which may be useful, until an opportunity occurs of making a better one.

CERIORNIS BLYTHII. (Plate XV.)

Ceriornis temminckii, Jerdon, Ibis, 1869, p. 147.

Ceriornis blythii, ej. J. A. S. B. 1870, p. 60.

Supra rubescenti-brunneus, nigro variegatus et albo ocellatus, capite, collo undique et pectore aurantiaco-castaneis: vitta verticali lata et fascia utrinque auriculari nigris: facie et gula nuda splendide aureis, hac in parte inferiore nitide viride-

* For notice and figure of this species see P. Z. S. 1868, p. 1, pl. 1.

scente, inde a pectore linea nigra divisa : abdomine cineraceo-fusco, obsolete variegato, hypochondriis albo ocellatis : tectricibus alarum et tibiis imis castaneis : cauda intus lacteo-alba nigro terminata, extus fusca : rostro (in ave viva) nigro, pedibus rubido-carneis : iride obscure brunnea : crassitie fere specierum reliquarum.

Hab. in Assamiâ superiore (*Jerdon*).

Vivario. Soc. Zool. Londinensis.

The present bird will therefore form a fifth member of the genus *Ceriornis*, of which the species now known to science will stand as follows:—

1. *CERIORNIS SATYRA* (Gould, B. Asia, pt. xx.).

Hab. Southern slopes of the Himalayas of Nepaul, Sikim, and Bhotan, at an elevation of from 6000 to 9000 feet.

Pairs of this Tragopan were first received by the Society in 1863. They bred in the Gardens in 1864 and the following years, and we had good hopes of their becoming permanent denizens of our aviaries*; but, I am sorry to say, these expectations have not been fulfilled, and we have since lost the whole of these birds. Nor, I believe, have the sister societies on the Continent been more successful in the present case.

2. *CERIORNIS MELANOCEPHALA* (Gould, B. Asia, pt. vii.).

Hab. Southern slopes of North-western Himalayas, at an elevation of from 6000 to 9000 feet, Kumaon, Gurwhal, and Cashmere.

3. *CERIORNIS TEMMINCKII* (Gould, B. Asia, pt. xxi.).

Hab. Hills of Eastern and Northern Szechuen, extending thence into Central China.

Monseigneur Chauveau sent skins of this *Ceriornis* from the hills above Ta-kien-liou along with those of *Lophophorus lhuysi* and *Ithaginis geoffroyi* (Bull. Soc. Acl. 1867, p. 705). Living examples were likewise obtained by Mr. Medhurst to the north of Hankow along with those of Reeves's Pheasant.

4. *CERIORNIS CABOTI* (Gould, B. Asia, pt. x.).

Hab. Hills of Quang-sze, Southern China.

The original specimen of this bird was obtained at Macao, and for some years was the only individual known of the species. Mr. Swinhoe subsequently purchased a living example in a bird-shop at Hong-kong (see 'Ibis,' 1865, p. 350), and has reason to believe it was brought down the Hong-kiang, or West River, from the hills of the interior of Quang-sze, where there is a fine unexplored country.

5. *CERIORNIS BLYTHII*.

Hab. Hills of Upper Assam, at the head of the valley (*Jerdon*).

* Cf. Wolf & Sclater, Zoological Sketches, ii. pl. xxxix.

2. Further Notes on the Cuckoos of the Genus *Coccyzus*.

By P. L. SCLATER, M.A., Ph.D., F.R.S., Secretary to the Society.

In an article "On the Species of the American Genus *Coccyzus*," published in this Society's 'Proceedings for 1864 (p. 119 *et seqq.*), I separated from *Coccyzus americanus* a Jamaican specimen, under the name of *C. bairdi*, distinguishing it by the absence of rufous colour on the outer wing-margins, smaller size, purer white colour below, and other minor differences. Since that time Mr. W. T. March, so well known by his excellent notes on the birds of Jamaica*, has kindly sent me several skins of the *Coccyzus americanus* of that island for comparison, and I have also obtained other specimens of this bird from various localities. After carefully examining all these, I have come to the conclusion that *C. bairdi* is not tenable as a species, the skin on which it was founded being in fact merely an individual variety of *C. americanus*.

I have also been lately able to compare together a larger series of the two "Mangrove Cuckoos," *Coccyzus seniculus* sive *minor* and *C. nesiotus*, than I had formerly been able to examine, and am now of opinion that the latter so-called species of Cabanis and Heine is not fairly separable from the former.

This reduces the number of species of *Coccyzus*, as given in my list (P. Z. S. 1864, p. 120), by two. On the other hand we must add *Coccyzus cinereus* of Vieillot, of which, as already stated in these Proceedings†, I have lately examined several specimens, and which proves to be a most distinct species, and *Coccyzus ferrugineus* of Gould, which was omitted in my former list. This raises the total number of valid species to eight again, which may be arranged as follows:—

- | | | |
|---|----|---------------------------|
| A. Species cauda valde graduata ; mandibula ad basin flava. | | |
| a. Supra pallide cinerei unicolores. | | |
| a'. Infra albus | 1. | <i>americanus</i> . |
| b'. Infra ochraceus..... | 2. | <i>minor</i> . |
| b. Supra rufus: pileo cinereo | 3. | <i>ferrugineus</i> . |
| B. Species cauda valde graduata; rostro nigro. | | |
| a. Supra fuscii. | | |
| a'. Pileo concolori: subtus albus..... | 4. | <i>erythrophthalmus</i> . |
| b'. Pileo cinereo: subtus ochraceus..... | 5. | <i>melanocoryphus</i> . |
| b. Supra subtusque rufus: pileo plumbeo | 6. | <i>landsbergi</i> . |
| C. Species cauda fere æquali: rostro nigro. | | |
| a. Pectore pallide cinereo | 7. | <i>cinereus</i> . |
| b. Pectore late rufo | 8. | <i>pumilus</i> . |

1. *COCCYZUS AMERICANUS*.

Cuculus americanus, Linn. S. N. i. p. 170.

Cuculus carolinensis, Wils. Am. Orn. iv. p. 13, pl. 28. f. 1.

Coccyzus pyrrhopterus, Vieill. Enc. Méth. p. 1343.

* Proc. Acad. Sc. Phil. 1863, pp. 150 et 283.

† P. Z. S. 1869, p. 633.

Coccyzus americanus, Bp. Consp. p. 111; Gosse, B. Jam. p. 279; Sel. et Salv. Ibis, 1860, p. 43; Gundlach, Rep. F. N. i. p. 295; Sclater, P. Z. S. 1860, p. 252, 1864, p. 120; Newton, Ibis, 1859, p. 149; Léotaud, Ois. de Trin. p. 350.

Coccyzus americanus, Baird, B. N. Am. p. 76; Cab. J. f. O. 1862, p. 167; Cab. et Hein. Mus. Hein. iv. p. 75.

Coccyzus dominicus, Baird, Proc. Ac. Phil. 1863, p. 64.

Coccyzus bairdi, Sclater, P. Z. S. 1864, p. 120; Pelzeln, Orn. Bras. p. 273.

Supra fuscus, fronte cinerascens: remigibus intus rufis: subtus albus: rectricibus lateralibus nigris albo late terminatis, duabus mediis dorso concoloribus: rostro superiore nigro, inferiore ad basin aurantiaco: long. tota 11, alae 5.5, caudae rectr. med. 5.8, ext. 3.5 poll. Angl.

Hab. North America, Eastern States to Missouri plains (*Baird*); Mexico, Orizaba (*Sallé*); Cuba (*Gundlach*); Jamaica (*Gosse & March*); Ste. Croix (*Newton*); Trinidad (*Léotaud*); Guatemala (*Salvin*); Costa Rica (*v. Frantzius*); Panama (*M'Cleannan*); Bogota (*Mus. P. L. S.*); S. Paulo, Brazil (*Natt.*).

I have examples of this species in my collection from the United States, Mexico, Jamaica, and Bogota. In Salvin and Godman's collection are others, from the United States, Guatemala, and Panama. I have also compared those in the British Museum from various localities.

The rufous colour of the primaries does not always extend through to the outer webs, but varies in amount. In the skin which I called *bairdi* (supposing it to be the *dominicus*, Baird *nec auct.*) it does not show on the outer web at all.

I have a "Bogota" skin certainly referable to this species, so that it may probably straggle further south occasionally, and may be the species called by Pelzeln *C. bairdi* (Orn. Bras. p. 273), which was obtained by Natterer in the province of S. Paul, S.E. Brazil.

2. COCCYZUS MINOR.

Coucou des Paletuviers de Cayenne, Buff. Pl. Enl. 813.

Cuculus minor, Gm. S. N. i. p. 411.

Cuculus seniculus, Lath. Ind. Orn. i. p. 219.

Coccyzus seniculus, Vieill. Enc. Méth. p. 1346; Sclater, Cat. Am. B. p. 323; Taylor, Ibis, 1864, p. 170; Gosse, B. Jam. p. 281; Newton, Ibis, 1859, p. 150; Sallé, P. Z. S. 1857, p. 234; Sclater, P. Z. S. 1861, p. 79, et 1864, p. 121; Cab. et Hein. Mus. Hein. iv. p. 78; Pelz. Orn. Bras. p. 273.

Coccyzus helviventris, Cab. in Schomb. Guian. iii. p. 714.

Coccyzus minor, Baird, B. N. Am. p. 78; Gundlach, Rep. F. N. i. p. 295.

Coccyzus dominicus, Sclater, Cat. Am. B. p. 323.

Coccyzus nesiotus, Cab. et Hein. Mus. Hein. iv. p. 78; Taylor, Ibis, 1864, p. 170; Sclater, P. Z. S. 1864, p. 121.

Coccyzus minor, Léotaud, Ois. de Trin. p. 353; Bryant, Pr. Boston Soc. N. H. x. p. 254, xi. p. 96.

Supra fuscus, fronte cinerascens : regione auriculari nigricante : subtus pallide fulvus : reatricibus lateralibus nigris, albo late terminatis, mediis duabus dorso concoloribus : rostro superiore nigro, inferiore ad basin aurantiaco : long. tota 12, alæ 5·2, caudæ rectr. med. 6·2, lat. 3·7.

Hab. Florida (*Audubon*) ; Cuba (*Gundlach*) ; Jamaica (*Gosse*) ; S. Domingo (*Sallé*) ; Porto Rico (*Bryant*) ; Sta. Cruz (*Newton*) ; Dominica (*Taylor*) ; S. Lucia (*Mus. P. L. S.*) ; Guadeloupe et Martinique (*Mus. Paris*) ; Honduras (*Whitely*) ; Chiriqui (*Kellett, Mus. Brit.*) ; Trinidad (*Léotaud*) ; Cayenne (*Mus. Brit.*) ; Brit. Guiana (*Schomb.*) ; Cajutata near Pará (*Natt.*).

I have seven skins of this Cuckoo in my collection from Jamaica, S. Domingo, Porto Rico, Honduras, and S. Lucia. I have also examined those in the British Museum, from Chiriqui, Trinidad, and Cayenne, and am now of opinion that they are all referable to one species. For this we must employ the specific name *minor*, imposed by Gmelin upon Buffon's Pl. Enl. 813, which unmistakably represents the species.

When I wrote my American catalogue I was inclined to believe there might be two allied species of this form—an insular one, which I then termed *dominicus*, and a continental one, distinguishable principally by its thicker bill, which I considered to be the true *minor* (sive *seniculus*). In my paper on the genus, written in 1864, I retained this view, merely adopting for the species previously termed *dominicus* the name *nesiotes*, under which Cabanis and Heine had then described it.

Having now had an opportunity of examining more specimens, I have come to the conclusion that there are no sufficient grounds for maintaining these two supposed species as distinct. The differences consist chiefly in general dimensions and size of the beak ; but there is much variation in both these particulars. The type of Cabanis and Heine's *C. nesiotes*, as pointed out by Dr. Bryant (P. B. S. N. H. x. p. 255), is probably a young bird.

3. COCCYZUS FERRUGINEUS.

Coccyzus ferrugineus, Gould, P. Z. S. 1843, p. 105, et Zool. Voy. Sulphur, p. 46, pl. 29 ; Bp. Consp. i. p. 97.

Nesococcyx ferrugineus, Cab. et Hein. Mus. Hein. iv. p. 79.

Rufus, pileo cineraceo : subtus pallide fulvus : alis extus rufis ; caudæ reatricibus externis pallide fulvis, ad apicem albicantibus ; proximis utrinque versus apicem nigricante brunneo subobsoleto notatis, duabus mediis dorso concoloribus : rostro nigricante, mandibula ad basin flava : long. tota 10, alæ 5·2, caudæ 6.

Hab. Cocos Island, Pacific.

The typical specimen of this species is now in the British Museum, and is the only individual yet obtained, as far as I know, Cocos Island being far out of the track of ordinary collectors. The bird appears to me to be a true *Coccyzus*, though with somewhat of the rufous colouring of a *Piaya*. I have placed it in the yellow-billed

section of the genus, to which it clearly belongs if this mode of division be adopted; but as regards the indistinct colour of the rectrices it approaches more nearly to *C. erythrophthalmus*.

4. COCCYZUS ERYTHROPHTHALMUS.

Cuculus erythrophthalmus, Wils. Am. Orn. iv. p. 16, pl. 28. fig. 2.

Coccyzus erythrophthalmus, Bp. Consp. p. 111; Sclater, P. Z. S. 1859, p. 252; 1864, p. 122, et Cat. Am. B. p. 323; Léotaud, Ois. de Trin. p. 352; Scl. et Salv. Ibis, 1860, p. 276; Lawrence, Ann. L. N. Y. vii. p. 477; Gundlach, Rep. F. N. i. p. 295.

Coccygus erythrophthalmus, Baird, B. N. Am. p. 77; Cab. et Hein. Mus. Hein. iv. p. 76.

Supra fuscus, æneo lavatus: subtus albus: rectricibus pallide cinereis, albido terminatis: rostro nigro: long. tota 11, alæ 5.5, caudæ rectr. med. 6, lat. 3.5.

Hab. Eastern United States to Missouri plains (*Baird*); Cuba, rarely (*Gundlach*); Mexico (*Sallé*); Panama (*McCleannan*); Bogota (*Mus. P. L. S.*); Trinidad (*Léotaud*); Ucayali (*Hauxwell*).

This Cuckoo goes very far south, probably, however, only on its winter migration. It does not appear to visit the Antilles, except Cuba, and that rarely.

5. COCCYZUS MELANOCORYPHUS.

Coucou, Azara, Apunt. ii. p. 365. no. 267.

Coccyzus melanocoryphus, Vieill. Nouv. Dict. viii. p. 271, et Enc. Méth. p. 1344; Sclater, Cat. Am. B. p. 323; P. Z. S. 1864, p. 122, et 1866, p. 100; Scl. et Salv. P. Z. S. 1866, p. 195, 1867, p. 977, et 1869, p. 633; Pelz. Orn. Bras. p. 273.

Cuculus melanorhynchus, Cuv. in Mus. Par.; Less. Tr. d'Orn. i. p. 141.

Cuculus seniculus, Max. Beitr. iv. p. 348.

Coccyzus seniculus, Burm. Syst. Ueb. ii. p. 267; et La Plata-Reise, ii. p. 444.

Coccygus melanocoryphus, Cab. et Hein. Mus. Hein. iv. p. 77.

Piaya melacorypha, Léotaud, Ois. de Trin. p. 349.

Supra fuscus, pileo cinereo; regione auriculari nigra: subtus pallide ochraceus: rectricibus nigris albo terminatis, mediis duabus dorso concoloribus: rostro nigro: long. tota 11, alæ 4.6, caudæ rectr. med. 5.8, lat. 3.5.

Hab. Buenos Ayres, Conchitas (*Hudson*); Parana and Tucuman (*Burm.*); Paraguay (*Azara*); S.E. Brazil (*Max.*); Rio et S. Paulo (*Natt.*); Borba (*Natt.*); Ucayali (*Bartlett*); Pebas (*Hauxwell*); Cayenne (*Mus. P. L. S.*); Trinidad (*Léotaud*); Lima, W. Peru (*Nation*).

This *Coccyzus* has also an extensive range in South America, as will be seen from my list of localities. I have compared skins from Lima, Cayenne, Pebas, S.E. Brazil, and Buenos Ayres. The tinge of ochraceous colour below varies, as also the cinereous colour of the head; but the species may be always distinguished from *C. minor* (with which it has been confounded) by its black beak.

6. COCCYZUS LANDSBERGI.

Coccyzus landsbergi, Bp. Consp. p. 112; Cab. et Hein. Mus. Hein. iv. p. 79; Sclater, P. Z. S. 1864, p. 122.

Supra brunnescenti-rufus, pileo cinereo; alis extus rufis: subtus dilutior, pallide rufus: cauda æneo-nigra, rectricibus quatuor lateralibus albo late terminatis: mediis duabus dorso concoloribus: long. tota 10.4, alæ 4.5, caudæ 5.6.

Hab. S. Martha, New Granada.

Mus. Brit.

7. COCCYZUS CINEREUS.

El ceniciento, Azara, Apunt. ii. p. 368. no. 268.

Coccyzus cinereus, Vieill. N. D. d'H. N. viii. p. 272, et E. M. p. 1344; Bp. Consp. i. p. 112; Burm. Syst. Ueb. ii. p. 268; Hartl. Ind. Az. p. 17; Scl. et Salv. P. Z. S. 1869, p. 633.

Coccygus cinereus, Burm. P. Z. S. 1868, p. 634.

Fuscescenti-cinereus, subtus pallide cinereus, ventre medio albicante: subalaribus et crisso ochracescentibus: rectricibus fuscis, versus apicem nigricantibus, albo anguste terminatis; rostro nigro: long. tota 9, alæ 4.1, rectr. med. 3.11, lat. 3.7.

Hab. Paraguay (Azara); vic. of Buenos Ayres (Hudson).

This *Coccyzus* has been sometimes supposed to be the same as *C. melanocoryphus*, but is in fact, as recently pointed out by Dr. Burmeister, a most distinct species, having the lateral rectrices but slightly shorter than the middle pair. From what Mr. Hudson states (P. Z. S. 1870, p. 88) it would appear to have only lately become a denizen of the riverain forest near Buenos Ayres.

8. COCCYZUS PUMILUS.

Coccyzus pumilus, Strickl. Orn. Contr. 1852, p. 28, pl. 82; Sclater, Cat. Am. B. p. 323; Cab. et Hein. Mus. Hein. iv. 79; Scl. P. Z. S. 1864, p. 122.

Fuscescenti-cinereus, pileo cinereo: subtus ad imum pectus ferrugineus, ventre albo, subalaribus et crisso ochracescentibus: cauda fuscescenti-cinerea, nigro late terminata, inde albo anguste marginata: rostro nigro: long. tota 9, alæ 4, caudæ rectr. med. 4.2, lat. 3.8.

Hab. Trinidad (Strickl.); Venezuela, Bogota (Mus. S.-G.).

Mr. Strickland gives the locality of this Cuckoo as Trinidad; and I have a skin received in a collection which was stated to have come from that island. But I have some reason to believe that it is doubtful whether this bird really occurs in Trinidad. It is not mentioned by Léotaud, and many birds from the adjoining districts of Venezuela reach us in so-called "Trinidad" collections.

Messrs. Salvin and Godman have a "Bogota" skin of this Cuckoo, which shows that it is also found in the neighbouring republic of New Granada.

3. Descriptions of eight new Species of Shells from Australia and the Solomon Islands. By JAMES C. COX, M.D., C.M.Z.S.

(Plate XVI.)

1. *HELIX RAINBIRDI*, Cox. (Plate XVI. fig. 1.)

Shell deeply openly umbilicated, globosely turbate, rather thin, faintly striated, dark chestnut-brown, almost black, ornamented by two broad dark yellow bands about the centre of the whorls, and one round the umbilicus, which is much excavated and broadly funnel-shaped; spire broadly conoid, obtuse; whorls $6\frac{1}{2}$ to 7, convex, last deflected in front; aperture oblique, roundly lunate; lip dark and metallic at the margin, broadly expanded and somewhat reflected; margins approximating, joined by a thin callus; columellar margin much expanded, overhanging the broad, open, funnel-shaped umbilicus.

Hab. Mount Dryander, Port Denison, Queensland.

Diameter—greatest 1.75, least 1.20; height 1.35 inch.

This fine species, named after its discoverer, was sent to me as *Helix mitchellæ*, Cox, which in general appearance it much resembles; it is, however, easily distinguished by its less conical shape, and by its being openly umbilicated, whereas *H. mitchellæ* has a covered umbilicus.

2. *HELIX THATCHERI*, Cox. (Plate XVI. fig. 2.)

Shell deeply and openly umbilicated, depressedly globose, rather solid, finely obliquely striated, dull horny yellow, ornamented with a broad, dark chestnut band below the suture, with five or six fine dark lines round the centre of the whorls, and also a dark undefined zone round the umbilicus, which is of the same colour; this dark coloration extends across the last whorl in a broad undefined band along the margin of the aperture, and joins the band beneath the suture; spire flatly conoid; whorls $6\frac{1}{2}$, flattened, the last becoming much inflated, rapidly enlarged and a little depressed in front; base flat; aperture oblong-oval, large, oblique, livid white within; lip slightly thickened and everted, of a lighter colour than the interior; margins approaching, joined by a thin dark callus; columellar margin much dilated, half concealing the umbilicus.

Hab. Mount Bersaker, Rockhampton, Queensland (*Rainbird*).

Diameter—greatest 1.60, least 1.20; height 1.15 inch.

An interesting species, of an intermediate form between *Helix appendiculata* and *H. incei*, but easily distinguished from either by the marked inflation of the last whorl.

3. *HELIX NOVÆ-GEORGIENSIS*, Cox. (Plate XVI. fig. 3.)

Shell imperforate, globosely depressed, surface corrugated and shiny, white, ornamented with 5 or 6 narrow brown bands; apex of spire bluntly rounded; whorls 4, rapidly increasing in size, each



flatly sloping to the centre, causing a subcarinated appearance; last whorl suddenly reflected in front, and contracted near the aperture; aperture very oblique, ear-shaped, margin ivory-white, flatly expanded, the brown bands on the last whorl abruptly terminating at the base of the expanded lip; margins approaching, joined by a thin callus; columellar margin slightly dilated, and inclining to be tuberculated within.

Hab. New Georgia, Solomon Isles.

Diameter—greatest 0·95, least 0·70; height 0·55 inch.

4. *HELIX MACGREGORI*, COX. (Plate XVI. fig. 4.)

Shell very widely umbilicated, flatly discoidal, quite flat on the upper surface, widely excavated below, pale yellow brown; whorls 10 or 11, very slowly increasing, having a coiled-up appearance as in *H. polygyrata*, coarsely striated; last whorl keeled above, rounded below, slightly dilated and much deflected in front; suture margined; aperture very oblique, ovately rounded; lip with an irregular margin, very slightly thickened, not reflected.

Hab. New Ireland (*Brodie*).

Diameter—greatest 0·93, least 0·82; height 0·23 inch.

This species so much resembles the smaller varieties of *H. polygyrata* that it need not be mistaken for any other species; its coiled-up, money-like appearance would at once attract attention. I have named it in honour of my late friend Capt. MacGregor, who for several years was a most enthusiastic collector among the Solomon group of islands.

5. *HELIX CHANCEI*, COX. (Plate XVI. fig. 5.)

Shell imperforate, conoid, faintly striated from above downwards with straight striæ, and longitudinally striated with more distinct wavy striæ, white, ornamented on the centre of the whorls with a broad brown band, and round the base with a broad brown zone; spire pyramidal, black at the apex; whorls six, the last rapidly increasing in size and inflated, suddenly deflected in front, and contracted behind the lip; aperture large, irregularly ovately rounded, margins approaching, lip slightly thickened and reflected; columellar margin moderately dilated and excavated, and darkened by a black callus.

Hab. Ysabel Island, Solomon Islands.

Diameter—greatest 1·30, least 1·07; height 1·25 inch.

This handsome species is an intermediate form between *Helix coniformis* of Férussac and *H. louisidensis* of Forbes, but is of a more decidedly trochiform appearance.

6. *HELIX CONVICTA*. (Plate XVI. fig. 6.)

Shell imperforate, solid, orbicularly conoid, transversely faintly striated, and decussated with fine longitudinal striæ, pale yellowish white, ornamented with two narrow brown bands, one near the centre of the whorls, the other immediately below the suture, which is rather impressed; spire broadly conical, apex obtuse; whorls $6\frac{1}{2}$,

gradually increasing in size, last depressed in front; aperture roundately lunate; peristome white, expanded, margins slightly approaching; columellar margin ivory-white, triangularly expanded and fused into the body of the shell.

Diameter—greatest 0·90, least 0·73; height 0·74 inch.

Hab. Nichol Bay, Western Australia.

7. *BULIMUS SAN-CHRISTOVALENSIS*. (Plate XVI. fig. 7.)

Shell rimately perforate, conically ovate, club-shaped; spire elongated and proportionally slender, moderately thin, rather finely transversely malleated, pale brown, apex pink, abundantly and irregularly ornamented with triangular or irregular longitudinal zigzag markings; whorls 5, the last inflated and forming three-fourths the length of the shell; aperture elliptically oval; peristome pink, shortly expanded and very slightly thickened; columellar margin dilated and divided into two pillars—one, the larger and more highly coloured, prominent, and running spirally within the body of the shell, the second running forward toward the insertion of the opposite end of the peristome and becoming blended with a callus of union; in some specimens a tooth exists between the spiral internal pillar of the columella and the insertion of the opposite end of the peristome.

Diameter 1·20, length 1·60; aperture 1·45 long, 0·60 inch broad.

Hab. San Christoval, Solomon Islands.

8. *RECLUZIA HARGRAVESI**. (Plate XVI. fig. 8.)

Shell imperforate, pyriform, thin, scalariform, greenish horn-colour, shining, transversely obsoletely striated, and very indistinctly banded; whorls $6\frac{1}{2}$ –7, markedly rounded, and separated by a deep suture; aperture ovately rounded; peristome thin, simple; columellar margin thickened and expanded.

Hab. Miall River, Port Stephens, N.S.W.

Diameter—greatest 0·90, least 0·67; length 1·53; aperture 0·65 long, 0·50 inch wide.

DESCRIPTION OF PLATE XVI.

Fig. 1. *Helix rainbirdi*, p. 170.

2. *Helix thatcheri*, p. 170.

3, 3 a. *Helix novæ-georgiensis*, p. 170.

4, 4 a. *Helix macgregori*, p. 171.

5. *Helix chancei*, p. 171.

6. *Helix convicta*, p. 171.

7. *Bulimus san-christovalensis*, p. 172.

8. *Recluzia hargravesi*, p. 172.

* [Mr. H. Adams, who has been kind enough to look over this paper for Dr. Cox, remarks that this shell is pelagic, and was probably found at or near the mouth of the river, whither it had been driven by the winds from the sea.—ED.]

4. Note sur une nouvelle espèce de Pélican.

Par J. V. BARBOZA DU BOCAGE, F.M.Z.S. &c.

PELECANUS SHARPEI, nov. sp.

Supra albus, collo imo, interscapulio et tergo vix roseo tinctis; subtus cinnamomeo lavatus, macula magna pectorali cinnamomeo-castanea; fronte valde tumida; plumis frontalibus angulum acutum antice formantibus; crista cervicali brevi, erecta; rostro flavo, medio et lateribus nigricantibus, apice marginibusque rubris; genis nudis rubentibus; sacco gulari viridescenti-flavo; pedibus sordide carneis.

Hab. Angola.

Deux individus d'Afrique occidentale (Angola) en plumage de noces. Ils diffèrent beaucoup par la taille. Le plus grand dépasse en dimensions un exemplaire, qui existe au Muséum de Lisbonne, du *P. onocrotalus* ♂, provenant des mers d'Europe et acheté il y a longtemps à M. Verreaux; l'autre a à peu près la taille de celui-ci.

Ils appartiennent évidemment par la disposition des plumes frontales à la *section* qui comprend *P. onocrotalus*, *P. mitratus*, et *P. javanicus*; mais je crois impossible de les rapporter à aucune de ces espèces.

Le *P. onocrotalus* en est bien distinct par l'existence d'une crête occipitale pendante et par la teinte jaune-clair de la tache qui lui recouvre le jabot pendant la saison des amours.

Le *P. mitratus*, d'après Mr. Selater, est facile à reconnaître par sa taille plus petite, à son plumage d'un blanc pur et à sa longue crête occipitale, caractères qui ne se retrouvent pas chez nos spécimens. En outre Mr. Jerdon (*Birds of India*, iii. p. 856) lui donne pendant l'époque des noces une tache jaune au jabot.

Quant au *P. javanicus*, Horsf., qui n'est pas généralement admis, Mr. Selater le décrit, d'après Mr. Blyth, comme ne portant jamais de crête pendante à l'occiput ni de renflement au front, et ayant les couvertures alaires et les tertiaires liserées de noir, le bec d'un bleu livide et la tache pectorale d'un jaune foncé. À l'exception de l'absence de crête occipitale, tous les autres caractères ne conviennent pas à notre espèce.

Je profite de cette occasion pour rendre à Mr. Sharpe un témoignage public de mon admiration pour ses travaux, en lui dédiant cette espèce.

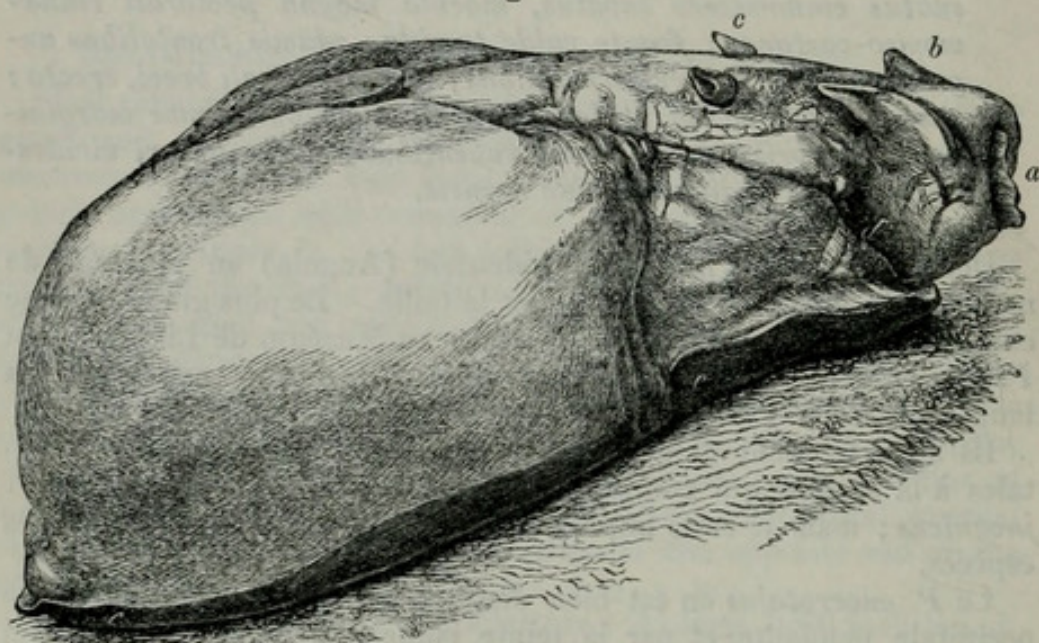
5. Description of a new British Mollusk, *Aplysia melanopus*.

By JONATHAN COUCH, F.L.S., C.M.Z.S.

A couple of molluscous animals were brought to me on the 3rd of January (1870), having been thrown on shore within the harbour of Polperro (on the east coast of Cornwall), in a severe storm. One of them was in a good state of preservation; but the other was

greatly bruised and mutilated, and was thus deprived of the lively colours which the first possessed. As I have never seen the species before, I have judged these animals worthy of particular notice; and I think that the more perfect example is deserving of a minute

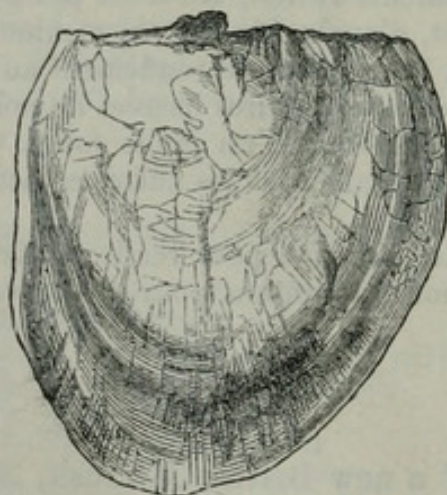
Fig. 1.

*Aplysia melanopus*, nat. size.

a, mouth; *b*, *c*, tentacles; *d*, reproductive organ (this and the eye scarcely visible in the woodcut); *e*, foot, of a dark colour.

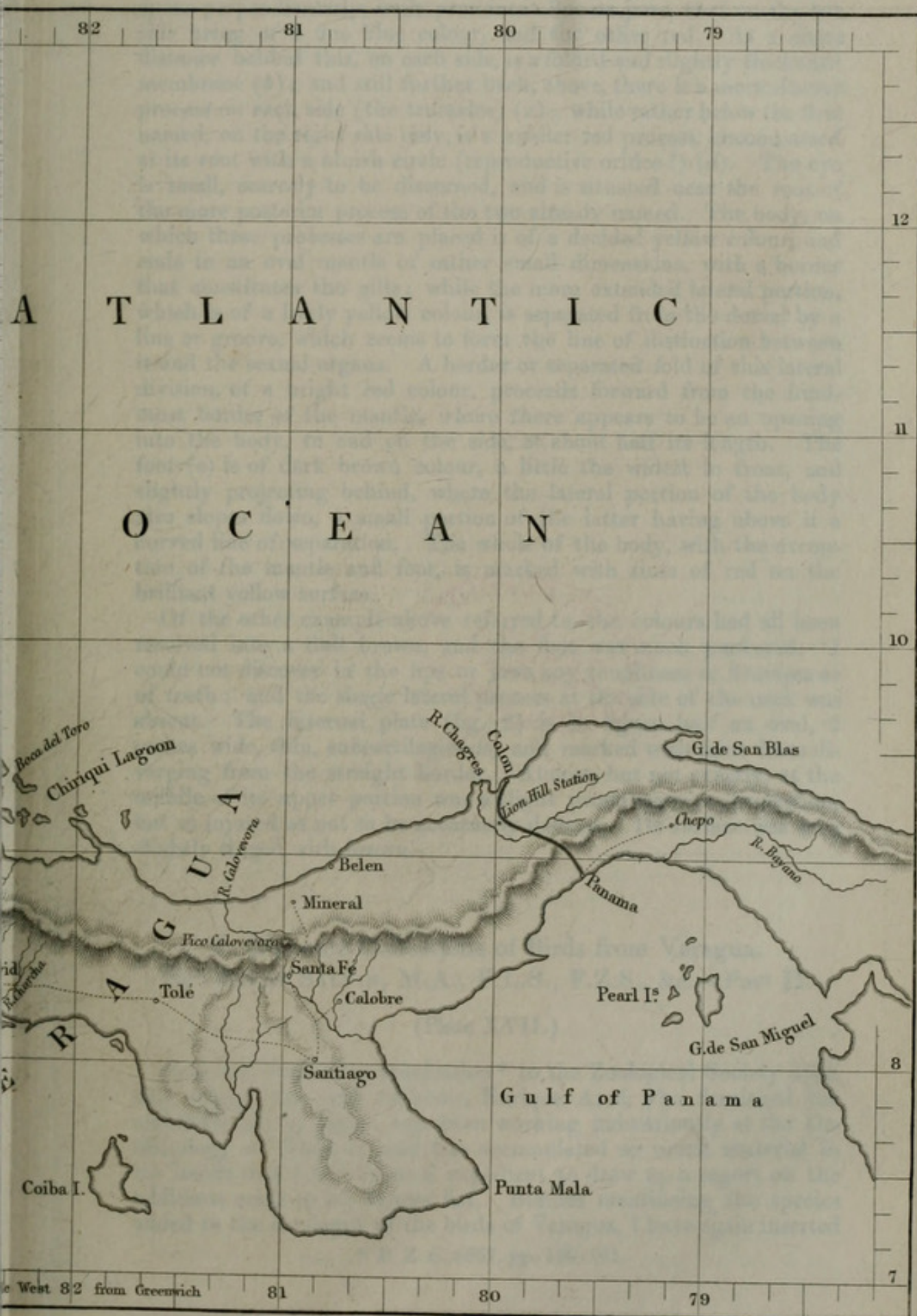
Fig. 2.

Nucleus.

Shell of *Aplysia melanopus*, showing nucleus to be nearly central.

description, as also of a place in the British Museum. Measured in a straight line, its length is $4\frac{1}{2}$ inches; it is very plump, especially posteriorly, where, in girth, it measures 6 inches. That part which forms the head projects; and in front of it is the mouth (*a*), which





opens perpendicularly, with prominent lips or jaws, that on the left side being of a fine blue colour, and the other red. At a short distance behind this, on each side, is a folded and slightly thickened membrane (*b*); and still further back, above, there is a more slender process on each side (the tentacles) (*c*); while rather below the first named, on the right side only, is a smaller red process, encompassed at its root with a bluish circle (reproductive orifice?) (*d*). The eye is small, scarcely to be discerned, and is situated near the root of the more posterior process of the two already named. The body, on which these processes are placed is of a decided yellow colour, and ends in an oval mantle of rather small dimensions, with a border that constitutes the gills; while the more extended lateral portion, which is of a lively yellow colour, is separated from the dorsal by a line or groove, which seems to form the line of distinction between it and the sexual organs. A border or separated fold of this lateral division, of a bright red colour, proceeds forward from the hindmost border of the mantle, where there appears to be an opening into the body, to end on the side, at about half its length. The foot (*e*) is of dark brown colour, a little the widest in front, and slightly projecting behind, where the lateral portion of the body also slopes down, a small portion of the latter having above it a curved line of separation. The whole of the body, with the exception of the mantle and foot, is marked with tints of red on the brilliant yellow surface.

Of the other example above referred to, the colours had all been resolved into a dull brown, and the foot was much puckered. I could not discover in the lips or jaws any roughness or firmness as of teeth; and the single lateral process at the side of the neck was absent. The internal plate (fig. 2) is in figure half an oval, 2 inches wide, thin, subcartilaginous, and marked with faint lines diverging from the straight border. Almost, but not exactly, at the middle of its upper portion was a slight prominence or projection, but so injured as not to be accurately defined. Its surface was very slightly tinged with brown.

6. On some Collections of Birds from Veragua.

By OSBERT SALVIN, M.A., F.L.S., F.Z.S., &c.—Part II.

(Plate XVII.)

Since my former communication* to the Zoological Society upon this subject, the same collector, Enrique Arcé, who furnished the materials for my paper, has been working industriously at the Ornithology of Veragua, and has accumulated so much material in my hands that I now deem it expedient to draw up a report on the additions made to my former list. Besides mentioning the species added to the catalogue of the birds of Veragua, I have again inserted

* P. Z. S. 1867, pp. 129-161.

into the present list the species concerning which fresh information, whether of distribution or classification, has been acquired. Although the greater number of species recorded in my former paper are here re-introduced, a considerable addition to our knowledge of their local distribution is made, and our information of the whole subject brought down to the most recent date in a complete form. Since 1867 Arcé has had the field to himself, no other naturalist having worked in his immediate district; though in the adjoining country of Costa Rica the Messrs. Carmiol and others have continued their assiduous labours. I have, then, nothing to add to the history of the literature of the birds of Veragua. The birds (of Arcé's collecting) described in these Proceedings since 1867 by Mr. Sclater and myself will all be inserted in their places; so it is unnecessary to enumerate them here.

That no small success has attended Arcé's labours will be manifest on referring to the total number of species of birds now given as inhabitants of Veragua. Nor are the novelties few or insignificant. The result shows that even the most limited areas of this rich country, when diligently examined, seldom fail to reveal some striking novelty, the existence of which in some cases could have in no way been anticipated, every gap in the distribution of allied forms being apparently filled in. The whole number of new species described since 1867, together with those now given, amounts to nineteen. Their names are as follows:—*Thryothorus semibadius*, *Buthraupis arcaei*, *Pyranga testacea*, *Tachyphonus nitidissimus*, *T. chrysomelas*, *Chlorospingus punctulatus*, *C. hypophæus*, *Grallaria princeps*, *Leptotriccus superciliaris*, *Empidonax atriceps*, *Chiromachæris aurantiaca*, *Antrostomus saturatus*, *Chætura fumosa*, *Lophornis adorabilis*, *Selasphorus torridus*, *S. ardens*, *Eupherusa egregia*, *Chloronerpes simplex*, *Melanerpes chrysauchen*.

Besides these nineteen species, five others are now added to the Central-American fauna, viz. *Leistes guianensis*, *Pseudocolaptes boissoneauti*, *Thamnophilus immaculatus*, *Stenopsis cayennensis*, and *Urubitornis solitaria*.

The genera now first introduced into the Central-American fauna are *Buthraupis*, *Leptotriccus*, *Leistes*, *Pseudocolaptes*, *Stenopsis*, and *Urubitornis*.

My first paper on the birds of Veragua records the occurrence of 216 species of birds in that country*. This number Arcé has now exactly doubled, by having transmitted no less than 216 additional species, thus raising the whole number to 432. It is more than probable that this number will be considerably increased; for in Costa Rica 520 species are recorded as inhabitants of that country, whilst on the Panama Railway-line the number is about 400.

Of these 432 species, 113 are not included in the Costa-Rican list, and at least 70 more are found at Panama which have not as yet been recorded from either Veragua or Costa Rica. From these figures we

* The actual number is 220, from which 4 (viz. nos. 37, 93, 159, and 206) must be deducted, the species being now otherwise determined.

get 703 species as an approximate estimate of the number of species included in the whole bird-fauna of Central America south of the Lake of Nicaragua. Considering how imperfectly several orders must be represented, we shall certainly not be estimating the whole number too highly if we place it at 720 species.

The superficial area of Central America south of the Lake of Nicaragua is about 38,000 square miles, or an area about equal to two-thirds that of England and Wales; yet in this limited extent of country we find a considerably greater number of birds than in the whole of Europe; in fact, the number nearly equals that of the whole continent of America, north of Mexico.

The names of the places visited by Arcé in his collecting-expeditions are Calovevora, Calobre, Chitra, Boqueti de Chitra, Castillo, Laguna del Castillo, and Cordillera del Chucu. Many of these places are unmarked on the best map I can find, viz. that of Codazzi, published in Bogotá in 1864; but from Arcé's letters I gather they are all situated in one district, near Calobre and Santiago de Veraguas, and are in what is called El Mineral de Veraguas. I also infer that Arcé's collecting-ground has been almost, if not entirely, on the southern, or that slope of the main Cordillera which stretches towards the Pacific Ocean.

The later collections, which bear the localities Mina de Chorchá, Bugaba, and Volcan de Chiriqui, were all made since Arcé reached David, the principal village of the district of Chiriqui. These collections, too, were formed on the southern slope of the Volcano, the highest point reached being about 6500 feet above the sea-level.

I hope yet to be able to fill in, on the accompanying map (Plate XVII.), all the names of the places above mentioned. In the meantime, those already supplied will give the general position of the districts explored.

The publication by Mr. Lawrence of 'A Catalogue of the Birds found in Costa Rica' (Ann. Lyc. N. Y. ix. pp. 86-149) supplies an important addition to our knowledge of the isthmian avifauna, and enables me to review in a more complete manner the generalizations I ventured to make respecting the relationship the birds of Veragua bear to those of the surrounding countries.

In my former paper I stated that the portion of Veragua then explored showed that, as regards its birds, a rather stronger numerical affinity was exhibited towards Panama than towards Costa Rica, and a slightly closer connexion with the more northerly portions of Central America than with the adjacent southern continent. But, owing to the incompleteness of our knowledge at the time of the bird-fauna of Costa Rica, I somewhat mistrusted the result shown by the facts at my disposal. Partly owing to the exploration of the district of Chiriqui, and partly to the large amount of distributional knowledge acquired by the publication of Mr. Lawrence's list, the relationship between bird-life in Veragua and in the adjoining countries now assumes to a great extent a different aspect. The bonds of union with Costa Rica are drawn much more close;

and, further, it now appears that the connexion with the Isthmus of Panama is hardly greater than with the more northern portions of Central America. These results may be exhibited as follows in a tabular form:—

Total number of species found in Veragua, 432.

Number of Veraguan species also found in

South America	179, or 41 per cent of the whole.
Panama	238, or 55 " "
Costa Rica	317, or 74 " "
Guatemala and Mexico	210, or 49 " "
North America	60, or 14 " "

I find that the number of birds which are not found outside the limits of Panama, Veragua, and Costa Rica, or that part of Central America included between the Isthmus of Darien and the Lake of Nicaragua, is altogether about 175 species; or, if we take the whole bird-fauna of this district, at say 720, 25 per cent. are peculiar.

These 175 species are distributed as follows:—

Number peculiar to

Panama	15, or $3\frac{3}{4}$ per cent. of the ascertained fauna.
Veragua	29, or 7 " "
Costa Rica	35, or 7 " "

79

Veragua and Costa Rica have in common	49 species
Veragua and Panama " 	14 "
Veragua, Panama, and Costa Rica " 	26 "
Costa Rica and Panama " 	7 "

96

Add peculiar species 79

175

Thus, viewing this section of the Isthmus as a whole, we find that, without making any deductions whatever, no less than 25 per cent. of its bird-population is unrepresented specifically in any other portion of the adjoining regions. When, however, we take a portion of this country and compare it with the rest of the whole district, we find that the greatest amount of peculiarity does not exceed 7 per cent.; and the least amount reaches as low as $3\frac{3}{4}$ per cent.

The characteristic elements of the Central-American fauna consist not so much in the amount of generic peculiarity, which is very small, but in the fact that a very considerable portion of South-American forms are here represented, not as specifically identical, but, in a large number of instances, as definably distinct in degrees of varying value. The element of the Central-American bird-fauna to be traced to the northern continent, on the other hand, maintains a very different relationship to the bird-fauna of that continent. With the exception of a few species isolated in the mountains of the higher

portions of the Isthmus, and some others, we find that northern forms found in Central America are specifically identical with northern species, and that their presence is due in a great measure to migration during the winter season. As regards numbers, we find a gradual diminution as we proceed away from North America. These migrants, however, are everywhere present, some few passing still further south into the equatorial provinces of the southern continent.

Costa Rica and Veragua, with Panama, possess these characteristics of the Central-American fauna in the highest degree. It is here we find the greatest number of South-American genera represented; but the species are to a considerable extent not the same as the continental species.

We find, too, a considerable number of northern migrants, most of which are specifically identical with northern birds.

In endeavouring to account for the facts as we find them, by changes in past times in the physical features of the Isthmus, we seem to require:—1st. A union between Costa Rica, Veragua, and Panama with the southern continent, when those united lands possessed in common a much larger number of species specifically the same than at present. During this time the oceans may have been united north of Costa Rica. 2nd. The long duration of Costa Rica and Veragua as a “continental” island, during which time the union of the two oceans has been of greater extent. This period must be long enough to have established specific differences much as we now find them. 3rd. The emergence of the whole Isthmus in its present form.

These requirements seem to fall in fairly with what has been demanded in other branches of natural science. Dr. Duncan* requires a union in Miocene times between the oceans to account for the specific identity of certain corals; Dr. Günther†, too, requires a union between the oceans to account for the specific identity of 30 per cent. of the fish now found on both sides of the Isthmus.

The union here demanded will suit my first and second requirements, I only regulate the amount; and as for the period when it took place, the fixing it to Miocene times would seem to answer to the requirements of the birds.

That *all* the peculiar features of so varied a fauna can be accounted for by this theory I do not pretend to say. The changes in the physical features of the Isthmus indicated by the numerous minor modifications of existing species, belong to the most recent events in geological history. To account for the greater differences observable we must go deeper into the abyss of geological time, where light at present is barely perceptible.

Catharus griseiceps.

Chitra; Calovevora; Calobre.

1. CATHARUS MEXICANUS, Bp.; Scl. Cat. Am. B. p. 1.

Calovevora; Cordillera del Chucu.

* Quart. Journ. Geol. Soc. xix. 1863, p. 455.

† Trans. Zool. Soc. vi. p. 397.

Contrary to my expectations (P. Z. S. 1867, p. 132), it appears that this species is found in Veragua, as well as the next following, which is also met with in Costa Rica (Lawr. Ann. Lyc. N. Y. ix. p. 90). Arcé has sent us two specimens.

Catharus fuscater.

Calovevora; Cordillera del Chucu.

2. *TURDUS ALICLÆ*, Baird, Rev. Am. B. p. 21.

V. de Chiriqui.

A single specimen from the southern slope of the Volcano of Chiriqui agrees accurately with a specimen thus named by Prof. Baird in our collection, received from the Smithsonian Institution. This Thrush has not as yet been noticed in Mexico or Guatemala; but in Costa Rica its occurrence is recorded (Lawr. Ann. Lyc. N. Y. ix. p. 91).

Turdus grayi.

Chitra; V. de Chiriqui.

Turdus tristis (Sw.); Scl. & Salv. Ex. Orn. p. 145. *T. leucauchen*, Scl.; Salv. P. Z. S. 1867, p. 132.

Calovevora; Calobre; Boquete de Chitra; V. de Chiriqui.

A typical specimen from Bullock's Mexican collection, marked "*Turdus tristis*" in Swainson's MS., now in the Museum of the University of Cambridge, fully confirms the view taken (Ex. Orn.) as to the bird called *T. assimilis*, Cab., being identical with *T. tristis* of Swainson.

Turdus obsoletus.

The acquisition of additional specimens from Costa Rica tend to confirm Mr. Lawrence's view that the sexes of this species are similar in plumage, and that the bird is allied to *T. grayi* rather than to the section containing such species as have the male black and the female brown.

3. *TURDUS NIGRESCENS*, Cab. J. f. Orn. 1860, p. 324.

V. de Chiriqui.

Evidently a highland species. It has hitherto only been noticed in the woods of the Volcano of Yrazu, in Costa Rica, and similar localities. Arcé has forwarded a pair. The sexes, as marked by him, are quite similar in coloration.

Rhodinocichla rosea.

Calovevora; Chitra; Mina de Chorchá.

4. *MYIADESTES MELANOPS*, Salv. P. Z. S. 1864, p. 580, t. 36.

Calovevora; Cordillera del Chucu.

5. *THRYOTHORUS FASCIATOVENTRIS*, Lafr.; Scl. & Salv. P. Z. S. 1864, p. 346.

Bugaba.

This fine species is also found in Costa Rica (Lawr. Ann. Lyc. N. Y.

ix. p. 92). Arcé obtained several specimens, in some of which the cross markings on the under parts are almost obsolete.

6. *THRYOTHORUS SEMIBADIUS*, sp. n.

Supra intense castaneus, fronte et capitis lateribus albis, plumis singulis nigro marginatis: alis et cauda nigris extus badio transfasciatis, tectricibus alarum minoribus albo transvittatis: subtus albus, a pectore usque ad caudam nigro transfasciatus, gula pure alba, hypochondriis postice castaneo lavatis: rostro corneo mandibula pallidiore; pedibus nigricantibus: long. tota 5.3 poll. angl., alæ 2.6, caudæ 2.0, rostri a rictu 0.9, tarsi 0.9.

Fem. *Omnino mari similis.*

Hab. Bugaba (Arcé).

Obs. Species distincta, *T. nigricapillo* Scl. forsan affinis, sed pileo nigro carens.

This species belongs to the section *Thryophilus*, Baird, having an open and not operculated nostril. It has no very near allies, but somewhat resembles *T. nigricapillus* and *T. castaneus*, Lawr., both of which, however, are black-headed species, and have the under parts less densely and regularly marked. Arcé has forwarded us both sexes of this Wren from the district of Chiriqui.

7. *THRYOTHORUS MODESTUS*, Cab. J. f. Orn. 1860, p. 409.

Bugaba.

Specimens from this locality resemble the Panama race (Baird, Rev. Am. B. p. 131).

Thryothorus rufalbus.

Calovevora; Chitra; Castillo.

Thryothorus rutilus.

Boqueti; Calovevora; Bugaba.

This species, though common in Veragua, has not yet been met with in Costa Rica.

Henicorhina leucosticta.

Boqueti de Chitra; Cordillera del Chucu.

8. *HENICORHINA LEUCOPHRYS* (Tsch.). *Heterorhina leucophris*, Baird, Rev. Am. B. p. 118.

Calovevora; Chitra; Cordillera del Chucu; Mina de Chorchá.

Prof. Baird (*l. c.*) recognizes two races of this form; but after a close examination of our series of specimens, which includes examples from Bogota, I confess I do not think he has established his case. In all the differential characters brought forward I find variation in different individuals, so that the nine specimens before me, if separated, cannot be grouped in a definite manner. It is true, I may not have the species called by Baird *H. leucophris*; but a single Costa-Rica skin, and several from Veragua, seem to agree very well with his description. Our Guatemalan specimens are darker on the head than others from Bogota; the Veraguan examples are variable in this respect, as also in the amount of dark striations on the throat.

Baird, with some doubt, refers Mexican and Guatemalan specimens to *Merulaxis griseicollis*, Lafr. (R. Z. 1840, p. 103), a species Sclater considers, with Lafresnaye himself, to be a *Scytalopus* (Cat. Am. B. p. 168), and to belong to the *Pteroptochidæ*. Though not altogether satisfactory, I must say I think Lafresnaye's description suits the *Scytalopus* better than the *Henicorhina*, no mention whatever being made of the conspicuous markings on the sides of the head in the present bird. Taking Baird's list of localities, the evidence afforded by the distribution of this Wren is all in favour of there being but one species.

9. *CISTOTHORUS ELEGANS*, Scl. & Salv. ?; Baird, Rev. Am. B. p. 146.

Bugaba.

A single specimen in abraded plumage seems to belong to this species. The bill, however, is very robust, and the head exhibits none of the longitudinal light markings to be seen in *C. elegans*. As regards the colouring of the lower back and uropygium, the chief distinguishing character between *C. elegans* and *C. palustris*, this skin agrees very fairly with the former. The specimen is not in a condition good enough to enable me to determine it satisfactorily.

10. *POLIOPTILA SUPERCILIARIS*, Lawr.; Baird, Rev. Am. B. p. 71.

Bugaba.

Mniotilta varia.

Calovevora; Cordillera del Chucu; V. de Chiriqui.

11. *PARULA INORNATA*, Baird, Rev. Am. B. p. 171.

Boqueti de Chitra; V. de Chiriqui.

12. *PARULA GUTTURALIS* (Cab.), J. f. Orn. 1860, p. 329; Baird, Rev. Am. Birds, p. 172.

V. de Chiriqui.

Arcé's last collection contains three specimens of this beautiful species, which are the first I have ever seen. According to Arcé's dissections, both sexes have the interscapular region black; but in the female this character is neither so extensive nor so regular in form as in the male.

Helminthophaga chrysoptera.

Calovevora.

Helminthophaga peregrina.

Calovevora; V. de Chiriqui.

Dendræca pennsylvanica.

Chitra; Calovevora; V. de Chiriqui.

13. *DENDRÆCA VIRENS* (Gm.); Baird, Rev. Am. B. p. 182.

V. de Chiriqui.

14. *DENDRÆCA CÆRULEA* (Wils.); Baird, Rev. Am. B. p. 191.
Calovevora.

Dendræca blackburniæ.

Calovevora; Chitra; Calobre; Cordillera del Chucu; V. de Chiriqui.

Dendræca æstiva.

Calovevora; Chitra; Calobre; Cordillera del Chucu; Bugaba.

15. *MYIODIOCTES PUSILLUS* (Wils.); Baird, Rev. Am. B. p. 240.

V. de Chiriqui.

16. *HENICOCICHLA NOVEBORACENSIS* (Gm.); Baird, Rev. Am. B. p. 215.

Calovevora.

17. *HENICOCICHLA LUDOVICIANA* (Aud.); Baird, Rev. Am. B. p. 217.

Bugaba.

18. *HENICOCICHLA AUROCAPILLA* (L.); Baird, Rev. Am. B. p. 214.

V. de Chiriqui.

Basileuterus mesochrysus.

Chitra; Calobre.

19. *BASILEUTERUS CULICIVORUS* (Licht.); Baird, Rev. Am. B. p. 245.

Calovevora.

20. *BASILEUTERUS BIVITTATUS* (Lafr. & D'Orb.), Salv. Ibis, 1870, p. 108. *B. melanotis*, Lawr. Ann. Lyc. N. Y. ix. p. 95.

Cordillera del Chucu.

21. *BASILEUTERUS MELANOGENYS*, Baird, Rev. Am. B. p. 248.

V. de Chiriqui.

A very well marked and distinct species, hitherto only known from the highlands of Costa Rica.

Basileuterus uropygialis.

Bugaba.

Setophaga ruticilla.

Calovevora; Chitra.

22. *SETOPHAGA AURANTIACA*, Baird, Rev. Am. B. p. 261; Salv. Ibis, 1869, p. 313.

Calovevora; V. de Chiriqui.

This species is exceedingly closely allied to *S. verticalis* (D'Orb. & Lafr.), the under surface of which, however, is lemon- rather than

orange-coloured. This difference is well shown by a very bright-coloured specimen from Chiriqui, which has also the forehead and sides of the crest deep black, instead of plumbeous, the other distinctive character pointed out by Prof. Baird.

23. *HIRUNDO HORREORUM*, Barton ; Baird, Rev. Am. B. p. 294.

Calobre ; V. de Chiriqui.

24. *ATTICORA CYANOLEUCA*, Vieill. *A. cyanoleuca*, var. *montana*, Baird, Rev. Am. B. p. 310.

Calovevora.

25. *STELGIDOPTERYX FULVIPENNIS* (Scl.) ; Baird, Rev. Am. B. p. 316 ; Salv. Ibis, 1870, p. 108.

Calovevora.

Two examples, agreeing with Costa-Rican and Guatemalan specimens.

26. *STELGIDOPTERYX UROPYGIALIS* (Lawr.). *S. fulvigula*, Baird, Rev. Am. B. p. 317.

Chitra.

Agrees with Panama specimens.

Vireosylvia flavoviridis.

Chitra ; Mina de Chorchá ; Bugaba.

27. *VIREOSYLVA PHILADELPHICA*, Cass. ; Baird, Rev. Am. B. p. 340.

Chitra.

28. *VIREOSYLVA FLAVIFRONS* (Vieill.) ; Baird, Rev. Am. B. p. 346.

Calovevora ; V. de Chiriqui.

29. *HYLOPHILUS OCHRACEICEPS*, Scl. ; Baird, Rev. Am. B. p. 376.

Bugaba.

Hylophilus viridiflavus.

Bugaba.

Hylophilus decurtatus.

Castillo ; Chitra ; Calovevora.

30. *VIREOLANIUS PULCHELLUS*, Scl. & Salv. Ex. Orn. p. 13, t. 8.

Calovevora.

31. *CYCLORHIS SUBFLAVESCENS*, Cab. J. f. Orn. 1860, p. 405 ; Baird, Rev. Am. B. p. 388.

V. de Chiriqui.

32. *PTILOGONYS CAUDATUS*, Cab. J. f. Orn. 1860, p. 402 ; Scl. & Salv. Ex. Orn. p. 11, t. 6.

V. de Chiriqui.

Arcé has sent two fine male specimens of this bird from the southern slope of the volcano of Chiriqui, a new and more southern locality for this beautiful species.

33. *DIGLOSSA PLUMBEA*, Cab. J. f. Orn. 1860, p. 411.

V. de Chiriqui.

As in the case of the last-mentioned species, the occurrence of *Diglossa plumbea* in the Chiriqui volcano indicates a more southern range for this hitherto purely Costa-Rican bird.

The female of *D. plumbea*, as might have been anticipated, is not distinguishable from that of *D. baritula*, Wagl. It is olivaceous brown above, with dark ochraceous edgings to the wing-coverts and secondaries ; beneath it is light brown, with an olive tinge over the breast and sides.

34. *DACNIS VENUSTA*, Lawr.

Bugaba.

35. *DACNIS CAYANA* (Linn.) ; Scl. Cat. Am. B. p. 50.

Mina de Chorcha.

I can detect no differences whatever between an adult male from this locality and a specimen from Pebas, Upper Amazons, which has been called *D. cayana* (Scl. & Salv. P. Z. S. 1867, p. 977). Two immature males from Chepo are somewhat intermediate between *D. cayana* and *D. ultramarina*, Lawr., inclining rather to the former. I should have expected that *D. ultramarina* would have alone represented this form in Central America, but such does not appear to be the case.

Chlorophanes guatemalensis.

Calovevora ; Boqueti de Chitra ; Bugaba.

Cæreba carneipes.

Calovevora ; Castillo ; Chitra ; Cordillera del Chucu ; Bugaba.

Cæreba lucida.

Bugaba.

Certhiola luteola.

Cordillera del Chucu ; Bugaba.

36. *CHLOROPHONIA CALOPHRYS* (Cab.) ; Scl. & Salv. Ex. Orn. p. 135, t. 68.

Calovevora ; Cordillera del Chucu ; V. de Chiriqui.

A highland species, hitherto only observed in Costa Rica.

37. *EUPHONIA ELEGANTISSIMA*, Bp. ; Scl. Cat. Am. B. p. 56.

Calovevora.

38. *EUPHONIA MINUTA*, Cab. ?; *Scl. Cat. Am. B.* p. 57. *E. minuta*, *Scl. & Salv. Ibis*, 1860, p. 275.

Calovevora ; Bugaba.

Two adult male specimens sent by Arcé agree accurately with the single example I obtained at Coban in 1859. The yellow forehead is rather darker in colour and greater in extent than in a Bogotan specimen of *E. minuta*. In the white crissum, in the markings of the tail-feathers, and in the tint of the upper surface, I can trace no difference, and therefore think it best not to describe the bird under a new name, believing that did I do so I should only be adding to the confusion introduced into the group by Cabanis, whose descriptions of the Costa-Rican species, being in several instances based upon immature birds, are very unsatisfactory and perplexing.

39. *EUPHONIA GRACILIS* (Cab.) ; *J. f. Orn.* 1860, p. 333.

Bugaba ; V. de Chiriqui.

The original specimens upon which Cabanis founded this species were all immature. We now have what I believe to be the adult, of which I give the following description :—

Supra cum gutture toto cærulescenti-nigra : alis extus viridi-æneo tinctis : fronte, pilei dimidio antico et corpore subtus luteis : cauda nigra immaculata : long. tota 3·8, alæ 2·3, caudæ 1·3, tarsi 0·65.

Obs. E. concinnæ affinis, sed fronte lutea nec nigra et colore supra cærulescentiore facile distinguenda.

40. *EUPHONIA LUTEICAPILLA* (Cab.) ; *J. f. Orn.* 1860, p. 332.

Boquete de Chitra ; Bugaba.

A very pretty and distinct species, of which we have received several specimens, both from Veragua and also from Panama (Paraiso Station). The female may be described as follows :—

Supra olivacea : alis caudaque nigris, extus olivaceo limbatis : subtus flava, medialiter clarior, hypochondriis olivaceo indutis.

Euphonia crassirostris.

Chitra ; Boqueti de Chitra ; Calovevora.

The undetermined specimen (No. 37 of my previous list) is an immature bird of this species.

Euphonia annæ.

Cordillera del Chucu ; Calovevora.

41. *EUPHONIA GOULDI*, *Scl. Cat. Am. B.* p. 60.

Bugaba ; V. de Chiriqui.

Calliste icterocephala.

Calovevora ; Boqueti de Chitra ; Cordillera del Chucu ; V. de Chiriqui.

Calliste gyroloides.

Calovevora ; Boqueti de Chitra ; Cordillera del Chucu ; Bugaba ; V. de Chiriqui.

Calliste franciscæ.

Calovevora ; Chitra ; Laguna del Castillo ; Mina de Chorchá ; Bugaba.

42. *CALLISTE DOWII*, Salv. P. Z. S. 1863, p. 168 ; *Scl. Ibis*, 1863, p. 451, t. 12.

Cordillera del Chucu.

The sexes of this species, as marked by Arcé, hardly differ. The male is somewhat brighter in plumage than the female.

43. *CALLISTE GUTTATA*, Bp. ; *Sclater*, Mon. *Calliste*, t. 10.

V. de Chiriqui.

44. *BUTHRAUPIS ARCÆI*, *Scl. & Salv. P. Z. S.* 1869, p. 439, t. 31.

Cordillera del Chucu.

Tanagra diaconus.

Calovevora ; Chitra.

Ramphocælus dimidiatus.

Calovevora ; Chitra ; Castillo ; Cordillera del Chucu ; Mina de Chorchá.

The last-mentioned locality, in the neighbourhood of Chiriqui, seems to be the most northern limit of the range of this species, as in Costa Rica it has not yet been observed.

Ramphocælus passerinii.

Mina de Chorchá ; Bugaba.

This species, on the other hand, seems to attain its most southern limit in the neighbourhood of Chiriqui.

45. *PYRANGA RUBRA* (L.).

Calovevora.

Pyranga æstiva.

Calovevora ; Chitra ; Boqueti de Chitra ; Cordillera del Chucu.

Pyranga testacea, *Scl. & Salv. P. Z. S.* 1868, p. 388. *P. hepatica*, *Salv. P. Z. S.* 1867, p. 139.

Calovevora ; Chitra ; Boqueti de Chitra.

This species has also been found in the vicinity of Belize, British Honduras (*Ridgway, Pr. Ac. Phil.* 1869, p. 133).

46. *PYRANGA ERYTHROMELÆNA* (Licht.).

Calovevora ; V. de Chiriqui.

47. *PYRANGA BIDENTATA*, Sw.

V. de Chiriqui.

Phœnicothraupis vinacea, *Lawr. Proc. Ac. Phil.* 1867, p. 94 ; *Ann. Lyc. N. Y.* ix. p. 99. *P. rubica*?, *Salv. P. Z. S.* 1867, p. 139.

Calovevora ; V. de Chiriqui.

Lanio leucothorax.

Calovevora ; Chitra ; Cordillera del Chucu ; Bugaba ; V. de Chiriqui.

Eucometis spodocephala.

Bugaba ; Mina de Chorchá.

With two adult specimens of this species, Arcé has sent a bird that I for some time considered to be an undescribed member of this genus, as the head and throat are of precisely the same tinge of olivaceous as the back, instead of being plumbeous as in adult birds of *E. spodocephala*. As I can detect no other differences whatever, except smaller dimensions, and the bird shows some signs of immaturity, I now think that it may be a young individual of the above species. The sex is not marked ; but it cannot be the normal adult female of *E. spodocephala*, as we have dissected specimens both of that species and *E. cristata*, which have shown that the sexes do not differ in coloration in this group.

48. *TACHYPHONUS NITIDISSIMUS*, sp. n.

Nitenti-niger, crista aurantiaca, tectricibus alarum minoribus et subalaribus albis : rostro nigro, mandibulæ basi albicante, pedibus fuscis.

Fem. Olivacea, subtus flavescens : alis et cauda fuscis, extus olivaceo limbatis : long. tota 5.5, alæ 2.8, caudæ 2.4, tarsi 0.75.

Hab. Bugaba (Arcé).

Obs. Affinis *T. delatirii* et *T. luctuoso*, sed ab hoc colore nitentiore et subalaribus albis, ab illo crista aurantiaca differt.

A very distinct species, curiously combining the characters of the two species above mentioned. In size it is also intermediate, being smaller than *T. delatirii* and larger than *T. luctuosus*. Arcé has sent several specimens, all from the district of Chiriqui.

49. *TACHYPHONUS CHRYSOMELAS*, Scl. & Salv. P. Z. S. 1869, p. 440, t. 32.

Cordillera del Chucu.

50. *CHLOROSPINGUS PUNCTULATUS*, Scl. & Salv. P. Z. S. 1869, p. 440.

Cordillera del Chucu.

51. *CHLOROSPINGUS HYPOPHÆUS*, Scl. & Salv. P. Z. S. 1868, p. 389.

Calovevora ; Chitra ; Boqueti de Chitra.

52. *CHLOROSPINGUS ALBITEMPORALIS*, Lafr. ; Scl. & Salv. P. Z. S. 1868, p. 630.

V. de Chiriqui.

Arremon aurantirostris.

Cordillera del Chucu ; Mina de Chorchá ; Bugaba.

Buarremon crassirostris.

Cordillera del Chucu.

53. BUARREMON CHRYSOPOGON (Bp.).

Castillo; V. de Chiriqui.

Buarremon brunneinuchus.

Calovevora; V. de Chiriqui.

54. PEZOPETES CAPITALIS, Cab. J. f. Orn. 1860, p. 415.

V. de Chiriqui.

This appears to be a rare species, as none of the collectors of the Smithsonian Institution have yet met with it. When in Costa Rica, Arcé was fortunate enough to obtain two specimens in the Volcan de Cartago; these are the only others I have seen. With the exception of the tarsi and toes being rather stronger, *Pezopetes* does not differ from *Buarremon*, in which genus it might be very properly included.

Saltator magnoïdes.

Calovevora; Chitra; Mina de Chorchá; Bugaba; V. de Chiriqui.

Saltator isthmicus.

Chitra.

55. HEDYMELES LUDOVICIANUS.

V. de Chiriqui.

56. PHEUCTICUS TIBIALIS, Lawr. Ann. Lyc. N. Y. viii. p. 478.

Calovevora; Chitra; Boqueti de Chitra; Calobre.

Guiraca concreta.

Calovevora; Boqueti de Chitra; Bugaba.

Oryzoborus funereus.

Calovevora.

57. SPERMOPHILA INTERMEDIA, Cab. Mus. Hein. i. p. 149. *S. schistacea*, Lawr. Ann. Lyc. N. Y. viii. p. 10.

Bugaba.

Agrees with specimens in Sclater's collection from Cayenne, Venezuela, and Bogotá.

Spermophila semicollaris.

Bugaba.

A specimen from this locality is without the white collar across the throat; others, from Calovevora, Chitra, and Mina de Chorchá, have this collar, but to a variable extent: I suppose these last should be called *S. collaris*, Lawr. One of the Chitra specimens has the rump quite white. Judging from seven specimens before me, and seeing that the amount of white forming the collar is variable, I find great difficulty in assigning my specimens to the species described by Mr. Lawrence as *Spermophila hicksi*, *S. semicollaris*, *S. collaris*, and *S. fortipes*, all of which are found on the Panama Railway-line or at Chiriqui. Concise diagnostic characters of these four birds would be useful, and would afford a better opportunity of judging

whether the grounds for their separation are based upon sufficiently constant characters.

From Mr. Lawrence's descriptions I gather that *S. semicollaris* has a white patch on each side of the neck, but no collar interrupting the uniform black of the chin, throat, and breast. *S. collaris* has a narrow white collar. *S. hicksi* has the throat white and a collar uniting with it. *S. fortipes* has a white patch on each side of the neck connected with a narrow collar, and thus differs from *S. semicollaris*, but resembles *S. collaris*, with which it is not compared.

Have we here really more than one variable species?

Volatinia jacarina.

Chitra.

Phonipara pusilla.

Chitra.

Cyanospiza ciris.

V. de Chiriqui.

58. CYANOSPIZA CYANEA (Linn.) ; Scl. Cat. Am. B. p. 107.
Calovevora.

59. ZONOTRICHIA PILEATA (Bodd.).
Calovevora ; Chitra ; V. de Chiriqui.

Embernagra striaticeps.

Calovevora ; Chitra ; Bugaba.

Euspiza americana.

Chitra.

60. CHRYSOMITRIS MEXICANA (Sw.) ; Scl. Cat. Am. B. p. 124.

This species ranges as far south as Panama (Scl. & Salv. P. Z. S. 1864, p. 353). The presence of *C. columbiana*, Lafr. (Lawr. Ann. Lyc. N. Y. ix. p. 103) in Costa Rica is at present hypothetical.

Ocyalus wagleri.

Chitra ; Calobre.

61. OSTINOPS CRISTATUS.

Bugaba.

This is the most northern locality yet recorded for this wide-ranging species. It is found at Panama but not in Costa Rica.

Cacicus microrhynchus.

Bugaba.

Cassiculus prevosti.

Calovevora ; Calobre.

Icterus baltimorensis.

Calobre.

Icterus gairaudi.

Chitra ; Castillo.

62. *LEISTES GUIANENSIS* (Linn.) ; Scl. Cat. Am. B. p. 138.

This common South-American species has not hitherto been noticed in Central America. Arcé's specimens differ in no way from Guiana and Bogotá examples.

63. *MOLOTHRUS ÆNEUS* (Wagl.) ; Scl. Cat. Am. B. p. 135.

Chitra ; Calobre.

A Central-American species occurring in Costa Rica, but not yet noticed at Panama.

64. *QUISCALUS MACRURUS*, Sw. ?

Calovevora ; Calobre.

Two males sent by Arcé are smaller than Guatemalan specimens attributed to this species, but do not otherwise differ. They agree in dimensions with a specimen from Panama in our collection.

Sturnella ludoviciana.

Castillo ; Calovevora ; V. de Chiriqui.

65. *CASSIDIX ORYZIVORA* (Gm.) ; Scl. Cat. Am. B. p. 142.

Calovevora ; Chitra ; Calobre.

This common species has not yet been sent from Costa Rica. In Guatemala it is abundant in the lowland forests of Vera Paz in the vicinity of the clearings.

66. *CYANOCORAX AFFINIS*, v. Pelz. ; Scl. Cat. Am. B. p. 145.

Calobre ; Bugaba.

The only member of the Corvidæ in Veragua and Panama. Its range does not extend to Costa Rica.

Sclerurus mexicanus.

Calovevora.

This species, now found to inhabit portions of the southern continent as well as Mexico, will almost certainly occur in Costa Rica, where, however, its presence has not yet been discovered.

67. *SYNALLAXIS ERYTHROPS*, Scl. P. Z. S. 1860, p. 66 ; Lawr. Ann. Lyc. N. Y. ix. p. 105.

V. de Chiriqui.

The four specimens forwarded by Arcé all agree with one another, and with Sclater's type specimens, with which I have compared them. We possess a specimen of *Synallaxis* from Costa Rica (*Carmiol*), which agrees accurately with Mr. Lawrence's description of his *S. rufigenis* (Ann. Lyc. N. Y. ix. p. 105). The bird is in immature plumage, and may possibly turn out to be a young state of *S. erythroptus*, though I hardly think so. Still the immature plumages of *Synallaxis* are so perplexing that I throw out this suggestion to induce a further examination should additional specimens come to hand.

68. *AUTOMOLUS PALLIDIGULARIS*, Lawr. ; Scl. & Salv. P. Z. S. 1864, p. 354.

Boqueti de Chitra ; Bugaba.

69. *PSEUDOCOLAPTES BOISSONEAUTI* (Lafr.) ; Scl. Cat. Am. B. p. 156.

Cordillera del Chucu.

A single immature specimen from the above locality agrees fairly with Bogotá specimens of this species. It is not improbable, however, that, when we see adult examples, differences may be found.

70. *ANABAZENOPS VARIEGATICEPS*, Scl. Cat. Am. B. p. 159.

V. de Chiriqui.

A Mexican and Guatemalan species, found also in Costa Rica, and here at probably the southern limit of its range.

71. *ANABAZENOPS SUBALARIS*, Scl. ; Salv. Ibis, 1870, p. 110. *A. lineatus*, Lawr. Ann. Lyc. N. Y. viii. p. 127, et ix. p. 106.

Calovevora.

72. *XENOPS HETERURUS*, Cab. ; Scl. Cat. Am. B. p. 159 ; Salv. Ibis, 1869, p. 319.

V. de Chiriqui.

This species hardly differs from the Brazilian *X. rutilus*, Licht. It also occurs in Costa Rica (Salv. *l. c.*).

Xenops mexicanus.

Calovevora ; Bugaba.

Margarornis brunnescens.

Chitra ; Cordillera del Chucu.

Costa-Rican agree with Veraguan specimens of this bird and with the type in Sclater's collection.

73. *SITTASOMUS OLIVACEUS* (Max.). *S. sylvioïdes*, Lafr. et auct. ; Lawr. Ann. Lyc. N. Y. ix. p. 106.

Calovevora ; V. de Chiriqui.

We have already given (Scl. & Salv. P. Z. S. 1868, p. 630) our reasons for uniting the Central-American with the Amazonian and Brazilian species described by Prince Max under the above name.

74. *GLYPHORHYNCHUS PECTORALIS*, Scl. & Salv. P. Z. S. 1864, p. 354.

Bugaba ; Mina de Chorchá ; V. de Chiriqui.

75. *DENDROMANES ANABATINUS*, Scl. Cat. Am. B. p. 161.

Bugaba.

A Mexican and Guatemalan species, but not yet observed in Costa Rica. A single example sent by Arcé agrees fairly with Guatemalan skins ; it is, however, rather darker in general tint, somewhat larger, and has the bill blacker.

76. *DENDROMANES HOMOCHROUS*, Scl. Cat. Am. B. p. 162.

V. de Chiriqui.

This species, in Guatemala at least, is frequently found associating with the last on the same tree, where they assemble, perhaps half a dozen together, to feed on ants.

77. *DENDROMANES ATRIROSTRIS* (Lafr. & D'Orb.); Scl. & Salv. P. Z. S. 1864, p. 355.

Chitra.

Also found in Costa Rica, but not further north.

Dendrocolaptes sancti-thomæ.

Bugaba.

78. *DENDRORNIS NANA*, Lawr.; Scl. & Salv. P. Z. S. 1864, p. 355.

Calovevora; Bugaba.

Agrees with Panama specimens referred to this species.

Dendrornis lacrymosa.

Bugaba; V. de Chiriqui.

Dendrornis erythropygia.

Calovevora; Boqueti de Chitra; Cordillera del Chucu; Bugaba, V. de Chiriqui.

79. *PICOLAPTES COMPRESSUS*, (Cab.) J. f. Orn. 1861, p. 243; Salv. Ibis, 1869, p. 314.

Mina de Chorchá; Bugaba.

This lowland forest species is distributed over the whole of Central America, from Mexico to this point; it is not, however, found at Panama. This species was formerly considered by writers on Central-American ornithology (except Cabanis) to be the *P. lineaticeps* of Lafresnaye (see Cabanis, *l. c.*).

80. *PICOLAPTES AFFINIS* (Lafr.); Scl. Cat. Am. B. p. 166.

V. de Chiriqui.

This species, unlike the last, frequents only the forests of the upland districts of Central America and the forest-belts of the higher volcanoes. It occurs at intervals from Mexico to Veragua, keeping, however, its specific characters with great constancy.

81. *XIPHORHYNCHUS PUSILLUS*, Scl. P. Z. S. 1860, p. 278.

Boqueti de Chitra.

Three specimens of this curious form sent by Arcé agree with the type of *X. pusillus* in Sclater's collection, and present none of those perplexing variations observable in *X. trochilirostris* and its allies. *Xiphorhynchus pusillus* may be readily recognized by its dark coloured bill, which is not red, as in some allied species, nor black as in *X. procurvus*, Temm. The plumage, too, is dark-coloured, and the elongated stripes are narrow. The species is not smaller than

some other members of the genus, as its name would imply, but even exceeds Bogotá specimens of *X. trochilirostris* in our collection. The sexes, as determined by Arcé, are quite alike.

82. *OXYRHYNCHUS FRATER*, Scl. & Salv. Ex. Orn. p. 131, t. 66.

Calovevora ; Chitra.

For a full account of this bird see our plate, *l. c.*

Cymbilanius lineatus.

Calovevora ; Calobre ; Mina de Chorchá.

83. *THAMNOPHILUS IMMACULATUS*, Lafr. ; Salv. Ibis, 1870, p. 114.

Calobre ; Calovevora ; V. de Chiriqui.

This species, of which Arcé has sent both sexes, is also found in Costa Rica as well as in New Granada. It has not yet been noticed at Panama.

84. *THAMNOPHILUS PUNCTATUS*, Cab. J. f. Orn. 1861, p. 241.

Mina de Chorchá, Bugaba, V. de Chiriqui.

Originally described from Costa Rica, whence we have a single skin collected by Carmiol. The bird appears to be commoner in the district of Chiriqui, where Arcé has obtained us a good supply of specimens.

85. *THAMNOPHILUS RADIATUS*, Vieill.

Chitra ; Calovevora.

Specimens from these localities agree with others from Panama ascribed to this species (see Scl. & Salv. P. Z. S. 1864, p. 355.).

Thamnophilus affinis, Cab. *T. doliatus*, Scl. P. Z. S. 1856, p. 141. Bugaba.

Specimens agreeing with this northern race having been sent from the district of Chiriqui, it follows that Bridges's specimens must also be ascribed to the same race.

Thamnophilus bridgesi.

Mina de Chorchá ; Bugaba.

On reaching the Chiriqui district, the original *habitat* of this species, Arcé at once obtained specimens. The same species also occurs in Costa Rica (Lawr. Ann. Lyc. N. Y. ix. p. 107).

86. *THAMNISTES ANABATINUS*, Scl. & Salv. P. Z. S. 1860, p. 299.

Calovevora ; Bugaba.

Arcé's determination of the sexes of this species confirms the view originally taken, that the individuals which possessed the ferruginous dorsal spot were males. Costa-Rican and Veraguan specimens agree with the types from Vera Paz.

Dysithamnus semicinereus.

Calovevora ; Chitra ; Calobre ; V. de Chiriqui.

Myrmotherula menetriesi.

Calovevora; Chitra; Bugaba; V. de Chiriqui.

The undetermined species, no. 93 of my previous list, is, I think, a female of this species, which is the only member of the genus *Arcé* has yet sent us from Veragua. Mr. Lawrence enumerates four species of this genus as found in Costa Rica, two of which I have not yet seen; the two others are also found at Panama, and may therefore belong to Veragua, but have hitherto escaped notice. I may also mention that we possess a skin collected by Carmiol in Costa Rica, which does not differ from these Veraguan birds, to which we have applied the above name.

87. *FORMICIVORA BOUCARDI*, Scl. Cat. Am. B. p. 183.

Bugaba.

Ramphocænus rufiventris.

Calobre; Bugaba.

Ramphocænus semitorquatus.

Calovevora.

Cercomacra tyrannina.

Mina de Chorchá; Bugaba.

88. *MYRMECIZA IMMACULATA*, Scl. & Salv. P. Z. S. 1864, p. 357.

Bugaba.

Agrees with Panama specimens. The species is also found in Costa Rica (Lawr. Ann. Lyc. N. Y. ix. p. 109).

89. *PITHYS BICOLOR*, Lawr.; Scl. & Salv. P. Z. S. 1864, p. 257.

Bugaba.

This species is also found in Costa Rica (Lawr. *l. c.*). *Arcé's* specimens agree with others from Panama, whence the types were obtained.

90. *GYMNOCICHLA NUDICEPS*, Cass.; Scl. & Salv. P. Z. S. 1864, p. 356, et 1869, p. 417.

Mina de Chorchá; Bugaba.

Specimens, including examples of both sexes, from the district of Chiriqui, agree with Panama skins of the true *G. nudiceps*, Cassin. A little further north, in Costa Rica, the race Sclater and I described as *G. chiroleuca* is found, which extends onwards into Honduras.

91. *FORMICARIUS HOFFMANNI* (Cab.); J. f. Orn. 1861, p. 95; Salv. P. Z. S. 1866, p. 75.

Bugaba.

This bird seems to be much more abundant at Panama than further to the northward, as no additional specimens have been obtained in Costa Rica since the original examples were sent to Berlin by Dr. Hoffmann.

Grallaria princeps, Scl. & Salv. P. Z. S. 1869, p. 418. *G. guatemalensis*, Salv. P. Z. S. 1867, p. 146.

Calovevora; V. de Chiriqui.

Since describing this species, Arcé has sent us another specimen, agreeing accurately with the two from which our characters were drawn (*l. s. c.*).

Grallaria perspicillata.

Mina de Chorchá; V. de Chiriqui.

Pittasoma michleri.

Calovevora.

Grallaricula costaricensis.

Calovevora; Chitra.

Attila sclateri.

Calovevora; V. de Chiriqui.

92. *PLATYRHYNCHUS ALBOGULARIS*, Scl. P. Z. S. 1860, p. 68, et Cat. Am. B. p. 207; Salv. Ibis, 1869, p. 314.

Calovevora; Chitra; Calobre.

A specimen from Costa Rica (*Carmioli*) and others from the above localities agree accurately with Sclater's types of this species. As yet the bird has not been seen at Panama.

Platyrrhynchus superciliaris.

Bugaba.

Todirostrum cinereum.

Calovevora; Calobre; Mina de Chorchá; Bugaba.

93. *ONCOSTOMA CINEREIGULARE*, Scl. P. Z. S. 1856, p. 295, et Cat. Am. B. p. 208.

Bugaba.

Here, as in Costa Rica, the northern race of this form prevails. At Panama we find *O. olivaceum*, Lawr.

94. *EUSCARTHUS SQUAMICRISTATUS* (Lafr.); Scl. Cat. Am. B. p. 209.

Calobre; Chitra; Boqueti de Chitra; V. de Chiriqui.

This species, abundant in Veragua, appears to be equally common in Costa Rica, though at Panama it does not seem to occur.

95. *LEPTOTRICCUS SUPERCILIARIS*, Scl. & Salv. P. Z. S. 1868, p. 389.

Chitra; Calovevora.

As yet Arcé has not sent any additional specimens of this species.

96. *MIONECTES OLIVACEUS*, Lawr. Ann. Lyc. N. Y. ix. p. 111; Salv. Ibis, 1869, p. 314.

Calovevora; Chitra; Boqueti de Chitra; V. de Chiriqui.

Mionectes oleagineus.

Calovevora; Boqueti de Chitra; Bugaba.

97. *LETOPOGON PILEATUS*, Cab. J. f. Orn. 1865, p. 414. *L. amaurocephalus*, Scl. & Salv. Ibis, 1860, p. 399.

Calovevora.

98. *LEPTOPOGON SUPERCILIARIS*, Cab. in Tsch. F. P. p. 161, t. 10. f. 2; Scl. Cat. Am. B. p. 214.

Calovevora; Bugaba; V. de Chiriqui.

Specimens of this species have also been sent us from Costa Rica. They do not differ from Ecuadorean examples in Sclater's collection, which he has referred to this species, though Cabanis (Mus. Hein. ii. p. 55) has separated the New-Granadan bird as *L. poliocephalus*, without having reexamined Peruvian examples.

99. *CAMPTOSTOMA FLAVIVENTRE*, Scl. & Salv. P. Z. S. 1864, p. 358.

Bugaba.

A single specimen agrees with our Panama types. At Realejo, in Nicaragua, I found the more northern *C. imberbe*, Scl.

Tyranniscus parvus.

Calovevora; Chitra; Boqueti de Chitra; Bugaba; V. de Chiriqui.

Elainea subpagana.

Chitra.

100. *ELAINEA FRANTZII*, Lawr. Ann. Lyc. N. Y. viii. p. 173.

V. de Chiriqui.

Two specimens of this *Elainea* agree with a typical specimen received from the Smithsonian Institution.

101. *ELAINEA PLACENS*, Scl. P. Z. S. 1859, p. 46, et Cat. Am. B. p. 217.

Calovevora; Chitra; Boqueti de Chitra.

Legatus albicollis.

Chitra; Bugaba.

Myiozetetes columbianus.

Calovevora; Chitra; Bugaba.

Rhynchocyclus brevirostris, Cab. Orn. Not. i. p. 249; Scl. Cat. Am. B. p. 220. *R. griseimentalis*, Lawr. Ann. Lyc. N. Y. ix. p. 112.

Calovevora; Bugaba; V. de Chiriqui.

I am quite unable to detect any tangible differences between Costa-Rican, Veraguan, and Guatemalan specimens of this form. Whether *R. mesorhynchus*, Cab. J. f. Orn. 1865, p. 414, is really separable from *R. brevirostris* of Mexico, I have no materials to determine. There is a curious feature in the formation of the first primary in this group of the genus, which is not shared by the *R. sulphurescens* section: the shafts of the outer web are slightly recurved and pointed, and form a stiff pectinated edge. The determination of the sexes in our specimens is not very satisfactory; but as I find that a

number of specimens have the outer web of the ordinary type, I conclude that this peculiar feature is an attribute of the male only.

Rhynchocyclus flavo-olivaceus.

Calovevora.

Myiodynastes nobilis.

Chitra ; Calobre ; Bugaba.

102. *HYPERMITRIS HEMICHRYsus*, Cab. J. f. Orn. 1861, p. 246.

Myiodynastes superciliaris, Lawr. Ann. Lyc. N. Y. viii. p. 470.

Chitra ; Calovevora ; Calobre.

Muscivora mexicana.

Calovevora ; Mina de Chorchá ; V. de Chiriquí.

Myiobius sulphureipygius.

Calobre ; Bugaba ; V. de Chiriquí.

103. *MYIOBIUS ATRICAUDUS*, Lawr. Ibis, 1863, p. 183.

Calovevora.

This species, as well as the last mentioned, occur in Veragua. A single specimen from the above locality quite agrees with Panama specimens.

Myiobius nævius.

Calovevora.

Myiobius erythrurus.

Bugaba.

104. *MITREPHORUS AURANTIIVENTRIS*, Lawr. Ann. Lyc. N. Y. viii. p. 174.

Calovevora.

105. *EMPIDONAX ATRICEPS*, sp. n.

Supra fuscus : uropygio et collo postico paulo dilutioribus, pileo toto nigro : alis et cauda nigro-fuscis, secundariis et tectricibus alarum majoribus sordide albo marginatis, rectricibus utrinque extimis extus albo limbatis : subtus ochraceo-fuscus, gula et ventre imo albicantibus, loris et macula postoculari albidis : campterio et subalaribus sordide albis : rostri maxilla nigra, mandibula flava, pedibus nigris : long. tota 4·5, alæ 2·3, caudæ 2·0, tarsi 0·6.

Hab. Volcan de Chiriquí (*Arcé*).

Obs. Species distincta, pileo nigro facile dignoscenda.

Arcé's collection from Chiriquí contains two specimens of this species, which, though a true *Empidonax*, is quite distinct in its coloration from any species I am acquainted with.

106. *EMPIDONAX FLAVESCENS*, Lawr. Ann. Lyc. N. Y. viii. p. 133.

Calovevora ; V. de Chiriquí.

This species is closely allied to *E. bairdi*, Scl., but differs in

having a larger bill, and in the more ochraceous tinge of the upper and under plumage. The markings on the wings, too, are ochre, and not olivaceous as in *E. bairdi*.

107. *EMPIDONAX FLAVIVENTRIS*, Baird ; Scl. Cat. Am. B. p. 229.
Calovevora.

108. *CONTOPUS BRACHYTARSUS* (Scl.) ; Cat. Am. B. p. 231.
Calovevora.

109. *CONTOPUS RICHARDSONI* (Sw.) ; Scl. Cat. Am. B. p. 231.
Calovevora ; Bugaba ; V. de Chiriqui.

This species has been recorded as occurring both in Costa Rica and Panama. I am not sure that I am right in referring these Veraguan specimens to *C. richardsoni*. The confusion in which these sombre-coloured *Contopodes* are involved makes their determination very unsatisfactory.

110. *CONTOPUS BOREALIS* (Sw.) ; Scl. Cat. Am. B. p. 230.
Calobre.

111. *MYIARCHUS PANAMENSIS*, Lawr. Ann. Lyc. N. Y. vii.
p. 295 ; Scl. & Salv. P. Z. S. 1864, p. 360.

Calovevora.

A single specimen agreeing with Panama skins.

Myiarchus nigricapillus.
Chitra.

Tyrannus melancholicus.
Calovevora ; Castillo ; Calobre.

Milvulus tyrannus.
Calovevora ; Castillo ; Calobre.

Tityra personata.
Calovevora ; Bugaba.

112. *TITYRA FRASERI*, Kp. ; Scl. & Salv. P. Z. S. 1867, p. 757.
Bugaba.

113. *PACHYRHAMPHUS ALBOGRISEUS*, Scl. P. Z. S. 1857, p. 78.
Calovevora ; Bugaba.
Specimens of both sexes, agreeing with Sclater's types.

Pachyrhampus cinereiventris.
Calovevora ; Bugaba.

Lipaugus unirufus.
Bugaba.

Lipaugus holerythrus.
Calovevora ; Chitra ; Boqueti de Chitra ; V. de Chiriqui.

114. *HETEROPELMA VERÆPACIS*, Scl. & Salv. P. Z. S. 1860, p. 300.

Castillo; Calovevora; Bugaba; V. de Chiriqui.

Rather darker in colour than Guatemalan specimens (typical), but not otherwise distinct.

115. *PIPRA MENTALIS*, Scl.

Mina de Chorchá; Bugaba.

Pipra leucocilla.

Calovevora; Chitra; Boqueti de Chitra.

Pipra leucorrhœa.

Calovevora; Laguna del Castillo; Bugaba; V. de Chiriqui.

Pipra cyaneocapilla.

Bugaba; V. de Chiriqui.

Chiroxiphia lanceolata.

Castillo; Calovevora; Chitra; Boqueti de Chitra; Calobre; Mina de Chorchá.

116. *CHIROMACHÆRIS AURANTIACA*, sp. n.

Supra olivacea, pileo toto, interscapulio et alis nigris, collo postico et corpore subtus læte aurantiacis, primariis extus et cauda olivaceo indutis: rostro nigro, pedibus carneis.

Fem. olivacea, uropygio et corpore subtus dilutioribus: long. tota 3·8, alæ 1·8, caudæ 1·2, tarsi 0·75.

Hab. Mina de Chorchá et Bugaba (*Arcé*).

Obs. *C. vitellinæ* similis, sed statura minore, ventre aurantiaco nec olivaceo, et colore subtus saturatiore aurantiaco facile dignoscenda.

In the distribution of its colours this species much resembles *C. vitellina* (Gould); but the distinctions given above suffice to show that it must be considered a different species.

That a distinct race of *Chiromachæris* should now be found in Veragua is remarkable, seeing that in Costa Rica we find the Central-American *C. candæi*, whilst at Panama *C. vitellina* occurs.

Arcé has sent a sufficient number of specimens to prove that the characters given above are quite constant.

117. *COTINGA AMABILIS*, Gould?

Bugaba.

I doubt whether an immature specimen of a *Cotinga* from Chiriqui is really referable to *C. amabilis*; but as that species is stated to be found both in Costa Rica and at Panama, it is more than probable that it should also occur at Chiriqui.

This specimen is much darker than a female example of *C. amabilis* from Vera Paz; and the edgings of the feathers both above and below are pale cinnamon-colour, instead of grey. The tail, too, is tipped with the same colour.

Chasmorhynchus tricarunculatus.

Calovevora.

Cephalopterus glabricollis.

Calovevora; Calobre.

Momotus lessoni.

Chitra; Mina de Chorchá; Bugaba; V. de Chiriquí.

Momotus martii.

Calobre.

Ceryle amazona.

Calovevora; Chitra.

Ceryle cabanisi.

Calovevora; Calobre.

Galbula melanogenia.

Mina de Chorchá; Bugaba; V. de Chiriquí.

The southern range of this species does not seem to pass the district of Chiriquí. Arcé has not sent a single specimen from Calobre or any of the neighbouring localities.

118. MALACOPTILA PANAMENSIS, Lafr. R. Z. 1847, p. 79.

Mina de Chorchá; Bugaba; V. de Chiriquí.

After comparing together about forty specimens of *Malacoptila* from various parts of Central America and Western Ecuador, Mr. Sclater and I have come to the conclusion that it is not possible to distinguish more than two species within these limits. As already hinted in our paper on Panama Birds (P. Z. S. 1864, p. 363), the paler-plumaged birds (*M. inornata*, Du Bus, and *M. poliopis*, Scl.) are females of the rufous forms which we have hitherto referred to *M. veræpaci*s and *M. panamensis*.

In the northern form, for which the term *inornata* is the oldest and must be adopted, the male is distinguishable by the rufous colouring extending nearly uniformly over the whole surface below, being slightly paler on the lower belly, and bearing very slight traces of dark markings on the margins of the feathers. In the southern form, for which the name *panamensis* must be retained, the breast alone is clear ferruginous, and is succeeded below by strongly mottled plumage, formed by the black lateral margins of each feather; the lower belly is pale fulvous, nearly white. These characters are still more strongly marked in the specimens from Western Ecuador in Sclater's collection. The females of the two forms are so exactly alike that it is not possible to distinguish them.

Of the northern form (*M. inornata*) all the specimens we have seen are from Guatemala. The birds from Costa Rica, Veragua, Panama, and Western Ecuador all belong to the southern form (*M. panamensis*), to which it seems *M. costaricensis* (Cab. J. f. Orn. 1862, p. 172) must be united.

119. BUCCO DYSONI, G. R. Gray; Scl. Cat. Am. B. p. 269.

Mina de Chorchá; Bugaba.

This species, though recorded both from Guatemala and Panama, has not yet appeared in the Costa-Rica lists.

Trogon caligatus.

Castillo ; Calovevora.

120. TROGON BAIRDI, Lawr. Ann. Lyc. N. Y. ix. p. 119 ; Salv. Ibis, 1869, p. 316.

Bugaba.

We have now both sexes of this fine species, of which the male only appears to have been previously known. The female I now describe as follows :—

Schistaceo-nigra, alis caudaque paulo obscurioribus et extus, nisi in rectricibus quatuor mediis, albo transfasciatis : ventre et crisso coccineis.

121. TROGON PUELLA, Gould.

V. de Chiriqui.

Though found in Costa Rica, this is the most southern locality yet recorded for the occurrence of this species.

Trogon aurantiiventris.

Calovevora ; Castillo.

The range of this species, which is abundant in the eastern parts of Veragua (Calovevora &c.), quite overlaps that of *T. puella*, a few individuals occurring as far north as Vera Paz. The two species are only to be distinguished by one having the underparts red, the other orange-yellow.

Trogon atricollis.

Calovevora ; Chitra ; Bugaba ; V. de Chiriqui.

Trogon clathratus.

Calovevora.

The range of this species is now shown to extend to Costa Rica (Lawr. Ann. Lyc. N. Y. ix. p. 119).

Trogon massena.

Bugaba ; V. de Chiriqui.

Pharomacrus mocinno.

Pharomacrus costaricensis, Cab. J. f. Orn. 1869, p. 313.

Calobre ; Calovevora ; V. de Chiriqui.

In an editorial note to Dr. v. Frantzius's paper on Costa-Rica birds, Dr. Cabanis proposed the separation of the Costa-Rican from the Guatemalan Quezal, and gave the former the name *P. costaricensis*. One of the distinctions pointed out consists in the number of elongated tail-coverts, the Guatemalan bird having, as stated, six, the Costa-Rican four. The former, too, is said to be of a more golden tinge on the upperside in certain lights, the latter being rather bluish. There can be little doubt that the tail-coverts attain a greater length and breadth in the Guatemalan bird ; but the number which exceed the length of the rectrices is never more than four, though another pair of elongated feathers sometimes reach as far as the extremity of the tail. The length of these plumes varies much ;

indeed their growth is seldom quite symmetrical; and therefore this character cannot be relied on as specific in every case. As regards the colour, I notice the difference pointed out in some instances, but not in all; so that this character, too, is untrustworthy. It is true that the general tendency of the Costa-Rican race is to have shorter and narrower caudal plumes than the Guatemalan; but this is all that can be said, and I do not think it possible to give unfailing characters by which the two races can be distinguished with certainty.

122. *NYCTIBIUS JAMAICENSIS* (Gm.); Scl. P. Z. S. 1866, p. 129.

A fine specimen of this species agrees with Jamaican examples in Sclater's collection, but is somewhat smaller than the Guatemalan skin, whose dimensions are given by Sclater (*l. c.*). Cabanis (J. f. Orn. 1869, p. 314, note) seems to consider *N. cornutus*, Vieill., distinct from *N. jamaicensis*, but assigns no reasons. Sclater places the former name as a synonym of *N. jamaicensis*, and looks upon the Jamaican and continental birds as one and the same species. As the dimensions of several specimens are given in Sclater's monograph, I add the measurement of this specimen: long. tota 15.0, alæ 11.0, caudæ 8.0, lat. rostri 2.2. It will be seen that these measurements almost exactly correspond with those of one of the Jamaican skins before referred to.

123. *CHORDEILES POPETUE*, Vieill.

Calovevora.

A single skin agrees with North-American examples. The species likewise occurs at Panama (Scl. & Salv. P. Z. S. 1864, p. 364).

124. *ANTROSTOMUS CAROLINENSIS* (Gm.); Scl. P. Z. S. 1866, p. 136.

V. de Chiriqui.

Also found in Guatemala and Costa Rica, but not southward of the point here recorded.

125. *ANTROSTOMUS SATURATUS*, sp. n.

♂. *Nigricans, rufo maculatus: alis nigris, extus solum rufo notatis, speculo alari nullo: subtus niger, rufescente transfasciatus, vitta gulari alba nulla, maculis albidis in medio ventre positis: cauda nigra rufo transfasciata: rectricibus tribus utrinque externis albo late terminatis, setis rectalibus longissimis: long. tota 8.5, alæ 6.1, caudæ 4.8.*

Hab. V. de Chiriqui (Arcé).

Obs. *A. nigrescenti* (Cab.) (Scl. P. Z. S. 1866, p. 138) affinis, sed rectricibus latiore albo terminatis, vitta quoque gulari et speculo alari absentibus, distinguendus.

This species, although I have compared it to *A. nigrescens*, belongs to section A of the *Antrostomi*, according to Sclater's arrangement (*l. c.* p. 136), having no white bar nor markings of any sort on the wing. It is of about the same size as *A. nigrescens*. The single skin sent does not show any white bar upon the throat but

there are slight indications of white markings, so that it is possible this band may be found in other examples.

126. *STENOPSIS CAYENNENSIS* (Gm.), Scl. P. Z. S. 1866, p. 140.

Calovevora.

A pair of Goatsuckers sent by Arcé agree fairly with the specimens thus named in Sclater's collection. The coloration of the tail, however, of the male exhibits rather less white than the Tobago specimen.

127. *NYCTIDROMUS GUIANENSIS* (Gm.); Scl. P. Z. S. 1866, p. 144.

Calovevora; Mina de Chorchá; Bugaba.

128. *CHÆTURA ZONARIS* (Shaw); Scl. P. Z. S. 1865, p. 609.

Chitra; Calovevora.

The occurrence of this species here was to be expected. No Swifts are recorded as found either in Costa Rica or Panama, though doubtless this species, *C. rutila*, Vieill., and the species I now describe may all be met with.

129. *CHÆTURA FUMOSA*, sp. n.

Fumido-nigra, abdomine paulo dilutiore, uropygio et gula cinerascens fuliginosis, cauda nigra: long. tota 4.5, alæ 4.1, caudæ 1.75.

Hab. Bugaba (Arcé).

Obs. *C. cinereiventris* similis, sed corpore subtus fuliginoso nec cinerascens distinguenda.

This species has a black tail like *C. spinicauda* and *C. cinereiventris*, but differs from both in the colour of the uropygium, which is smoky-brown, whereas in *C. cinereiventris* this portion of the plumage is clear ashy, and in *C. spinicauda* it is white. It is also darker beneath than either of these birds (see Scl. P. Z. S. 1865, p. 612).

Eutoxeres salvini, Gould, Ann. N. H. 4th ser. i. p. 455 (1868).

E. aquila, Salv. P. Z. S. 1867, p. 152.

Calovevora.

Arcé has sent specimens of this singular species in some numbers. The grounds on which Mr. Gould seeks to establish three species of this form, it must be confessed, are very slight; but as far as I can see (and I have examined a number of specimens), the characters given are quite constant. The present bird is the same as that figured in the 'Monograph of the *Trochilidæ*' under the name *E. aquila*.

130. *GLAUCIS RUCKERI*, Gould, Mon. Troch. i. t. 11, Intr. p. 39.

Mina de Chorchá.

This appears to be a rare species in Veragua, though more abundant

on the Panama Railway and in Costa Rica, the northern limit of its range.

131. *PHAËTHORNIS LONGIROSTRIS* (Delatt.); Gould, Mon. Troch. i. t. 19, Intr. p. 42.

Bugaba.

Two specimens of this common Central-American species have at last been obtained by Arcé. The bird seems also to be rare in Costa Rica, from which country I have received specimens since I wrote the note on *P. emiliæ* (P. Z. S. 1867, p. 152).

Phaëthornis emiliæ.

Calovevora; Boqueti de Chitra; Cordillera del Chucu.

132. *CAMPYLOPTERUS HEMILEUCURUS* (Licht.); Gould, Mon. Troch. t. 45, Intr. p. 52.

Calovevora; Chitra; Cordillera del Chucu.

By no means an uncommon species in Veragua. The specimens sent by Arcé differ in no way from Guatemalan and Mexican examples.

Phaeochroa curvieri (Delatt. et Bourc.); Gould, Mon. Troch. t. 52, Intr. p. 55.

Bugaba.

A single specimen only. The bird is common on the Panama Railway-line and about the eastern shores of the gulf of Nicoya in Costa Rica. In Guatemala this species is replaced by *P. roberti*, which, however, is only found in the forest-region of northern Vera Paz.

Oreopyra calolæma.

Calovevora; Cordillera del Chucu; V. de Chiriqui.

Oreopyra leucaspis.

V. de Chiriqui.

On reaching the volcano of Chiriqui, the locality whence Warszewicz obtained the original specimen of this species, Arcé procured an interesting series of skins of it. He writes me word that the females are like the females of *Oreopyra calolæma*, and have the breast cinnamon. If this view is correct, we should have three species with females very closely resembling one another, viz. *O. leucaspis*, *O. cinereicauda*, and *O. calolæma*; and then the true *O. castaneiventris* (*Anthocephala? castaneiventris*, Gould) will in all probability be the female of *O. leucaspis*. A close examination of a number of specimens of the so-called *O. castaneiventris* shows that Chiriqui specimens are of a brighter green above, and have the uropygium coloured uniformly with the back. In districts where *O. calolæma* alone occurs, specimens of the so-called *O. castaneiventris* have the back of a duller green, and the uropygium tinged with bluish; the bill, too, appears to be somewhat shorter. So far as our present knowledge extends, the geographical distribution of the three species is as follows:—*Oreopyra leucaspis* is restricted to the volcano of Chiriqui, *O. cine-*

reicauda is found only in the mountainous district round Cartago in Costa Rica, while *O. calolæma* embraces the range of both these species, and extends beyond into the district of Calobre in Veragua. Thus, if the females of these species closely resemble one another, we *ought* to find two varieties both around Cartago and Chiriqui, but only one in the vicinity of Calobre; and such to some extent appears to be the case. How far the females of *O. leucaspis* and *O. cinereicauda* differ, I have no means of showing; but I think that the differences pointed out above define the females of *O. leucaspis* and *O. calolæma*. On this view the birds which have been called *castaneiventris* must be assigned as follows:—

O. LEUCASPIS, Gould, P. Z. S. 1860, p. 312; Mon. Troch. iv. t. 264, Intr. p. 141. *Trochilus castaneiventris*, Gould, P. Z. S. 1850, p. 163. *Anthocephala castaneiventris*, Gould, Mon. Troch. iii. t. 203, Intr. p. 115. *Metallura castaneiventris*, Reich.

V. de Chiriqui.

According to the strict law of priority this bird should bear the name *O. castaneiventris*; but as this title applies only to the female, about which so much uncertainty exists, the more recent appellation *leucaspis* is much preferable.

The different stages of plumage of young males of *O. leucaspis* are very interesting. In some the white throat is only partially developed, the rest of the gorget being dark bronzy black. In others a few blue feathers are scattered over the white, but are more frequently seen, even in more adult birds, round the edge of the throat. Others, again, have green feathers rather thickly dispersed over the white, while the feathers of the crown show every shade from dull green to the brilliant coronet of the adult bird. According to Arcé's dissections, not one of these birds is a female; and I believe he is right, and that the young males, just as in *Eustephanus stokesi*, never assume, not even in the earliest dress, the female garb.

O. CINEREICAUDA, Lawr. Ann. Lyc. N. Y. viii. p. 485, et ix. p. 125. *O. castaneiventris*, Lawr. Ann. Lyc. N. Y. ix. p. 124 (? partim).

Mountains of Costa Rica (*Carmiol*).

The female of this species probably resembles that of *O. leucaspis* very closely. I have not seen any specimens of it as yet. Without examining all the Costa-Rica skins which have been called *O. castaneiventris*, it would be impossible to say whether females of the two Costa-Rica species have been confounded to constitute a third species; but I think it is not improbable. This point can only be settled by a reexamination of the skins in question.

O. CALOLÆMA, Salv. P. Z. S. 1864, p. 584, 1867, p. 153; Lawr. Ann. Lyc. N. Y. ix. p. 125. *O. venusta*, Lawr. Ann. Lyc. N. Y. viii. p. 484. *O. castaneiventris*, Salv. P. Z. S. 1867, p. 153; Lawr. Ann. Lyc. N. Y. ix. p. 125 (? partim).

V. de Cartago, Candelaria, Costa Rica; V. de Chiriqui, Cordillera de Tolé, Calovevora, Cordillera del Chucu, Veragua.

In the view I here adopt, all the cinnamon-breasted birds from Calobre &c. belong to this species. Whether all those collected in Costa Rica belong to the same remains to be seen. We have only two males as yet from the volcano of Chiriqui.

Lampornis veraguensis.

Calobre ; Cordillera del Chucu.

This Humming-bird has a very restricted range, answering nearly to that of *Chiromachæris aurantiaca* described above. At Panama the common *L. mango* (Linn.) is found, and in Costa Rica the Guatemalan *L. prevosti* (Less.), *L. veraguensis* occupying a small area between the two.

Heliodoxa jacula.

Calovevora ; Boqueti de Chitra.

Thalurania venusta.

Calovevora ; Chitra ; Boqueti de Chitra.

Microchera albo-coronata.

Cordillera del Chucu.

133. *LOPHORNIS DELATTRII* (Less.) ; Gould, Mon. Troch. t. 121, Intr. p. 84.

Castillo ; Laguna del Castillo.

Apparently common at certain seasons in this locality.

134. *LOPHORNIS ADORABILIS*, sp. n.

Supra nitenti-virescens : dorso postico albo, uropygio purpureo tincto : alis brunneo-nigris : cauda rufa extus viridescente limbata et rectricibus mediis eodem colore terminatis : fronte et pileo medio albis, plumis illius erectis et cupreo terminatis, plumis hujus elongatis in fila productis et cristam albam formantibus : subtus gulæ totius viridescens plumis lateralibus longissimis, supra dorsum retroductis ; pectore albo, ventre et crisso rufis, illo antice viridescente mixto : rostri basi carnea, apice fusco, pedibus fuscis : long. tota 2·7, alæ 1·55, caudæ rectr. med. 1·0, rectr. lat. 0·9, rostri a rictu 0·55.

Fem. capite et regione auriculari nigris : gula tota alba viridi-æneo parum punctata : cauda fascia lata subapicali nigra transversittata, rectricibus mediis medialiter viridescens tinctis : long. caudæ rectr. med. 0·8, lat. 0·65.

Hab. Bugaba ; V. de Chiriqui (Arcé).

This beautiful species is singularly distinct from any of its congeners, but perhaps belongs rather to the *L. magnifica* group than to that containing *L. helenæ*. In the whole genus, however, no other member has the erectile feathers on the forehead, the thread-like white plumes of the crest, or the long pointed feathers of the throat, which all combine to render this bird most distinct when compared with its allies.

The first specimen obtained by Arcé was a female, which, though

evidently belonging to a distinct species, I hesitated to describe. This specimen was shot at Bugaba. The last collection includes the male, which Arcé tells me his brother David obtained high up on the volcano of Chiriqui. That so fine a bird should have remained so long undiscovered seems singular; but the fact, I think, shows that the range of the species is extremely limited.

No less than two other species of *Lophornis* are found in this portion of Central America, viz.:—*L. helenæ*, the Mexican and Guatemalan bird, which is also to be met with in Costa Rica; and the southern *L. delatirii*, which seems to be abundant about Calobre and on the Isthmus of Panama.

Gouldia conversi.

Calovevora.

135. *TROCHILUS COLUBRIS*, L.; Gould, Mon. Troch. t. 131, Intr. p. 86.

V. de Chiriqui.

Though this species is found sparingly in Costa Rica, this is quite the most southern locality yet recorded for it, being doubtless the furthest point reached by a few individuals in their winter migration. Arcé has sent us a male in abraded plumage, and three females.

136. *SELASPHORUS TORRIDUS*, sp. n.

Supra virescens: alis purpurascanti-nigris: loris rufis, regione parotica rufa, nigro commixta: subtus gula tota nitente lilacino-rubra, plumis lateraliter elongatis: pectore, ventre medio et crisso albis, hypochondriis viridescence lavatis: cauda nigra, rectricibus lateralibus intus fere ad apicem rufo marginatis, rectrice extima utrinque macula parva in pogonio interno prope apicem rufa notata, rectricibus mediis viridescence lavatis: rostri maxilla nigra, mandibulæ basi carnea, pedibus fuscis: long. tota 2·7, alæ 1·6, caudæ 1·1, rostri a rictu 0·65.

Fem. pileo obscuriore, plumis singulis totius gulæ fusco medialiter punctatis; hypochondriis rufescentibus: cauda nigra, basi rufa, rectricibus tribus lateralibus albo terminatis, tertia et quarta extus rufo marginatis, mediis omnino viridescens.

Hab. V. de Chiriqui (Arcé).

The coloration of the throat of this species is peculiar, having a somewhat faded appearance. The tint is not brilliant red as in *S. scintilla*, nor does it resemble the gorget of *S. platycercus*, but is altogether of a more lilac hue. However, six males, sent by Arcé, are all so exactly alike that I cannot but suppose that the normal colour of the throat is shown. The lateral plumes of the throat, too, are elongated, reminding one of *Atthis heloisæ*, and thus render the species distinct from all *Selasphori* except *S. scintilla*, from which it differs widely in other respects. The most nearly allied species appears to be *S. flammula*, Salv. (P. Z. S. 1864, p. 586), which, however, has a differently coloured throat, as well as distinctive characters in the tail.

137. SELASPHORUS ARDENS, sp. n.

Supra viridescens: loris et regione parotica rufis, hac nigro mixta: subtus gula læte nitente rubra, sicut in Selasphoro platycerco: pectore toto, ventre medio et crisso albis: cauda sicut in specie præcedente, rectricibus mediis purpurascenti-nigris rufo limbatis solum exceptis: rostro toto nigro: long. tota 2·8, alæ 1·55, caudæ 1·15, rostri a rictu 0·65.

Mas hornot. gula fusco maculata: cauda nigra, basi rufa et rectricibus quatuor externis rufo terminatis, mediis viridescens, rufo marginatis.

Hab. Calovevora et Castillo (Arcé).

This species has the throat coloured just as in *S. platycercus*, which is in other respects a very different species. Its nearest allies, however, are *S. flammula* and *S. torridus*, described above; but it differs from both in the coloration of the throat, and also in having the central tail-feathers black, edged with rufous instead of green; this latter distinction is more conspicuous when the tail is compared with that of *S. flammula*. The wholly black bill and the absence of the elongated gular feathers distinguish it from *S. torridus*.

The male sent by Arcé is not in quite perfect plumage, but is so far satisfactory as to show a few faded feathers on the throat. These are bronzy, and quite different in colour from the gorget-feathers of either *S. flammula* or *S. torridus*.

Selasphorus scintilla.

V. de Chiriqui.

The original specimens of this species were obtained by Warszewicz in this locality, where Arcé seems to have found the bird occurring abundantly.

138. DORICHA BRYANTÆ, Lawr. Ann. Lyc. N. Y. viii. p. 483, et ix. p. 123.

Castillo; Laguna del Castillo; Cordillera del Chucu; V. de Chiriqui.

This fine species seems to be more abundant about Castillo than in the district of Chiriqui. Judging from the specimens sent by Arcé, the males are much more numerous than the females.

Clais merritti (Lawr.), Ann. Lyc. N. Y. vii. p. 110. *C. guimeti*, Salv. P. Z. S. 1867, p. 155.

Castillo; Calovevora; Chitra; Laguna del Castillo; Bugaba; V. de Chiriqui.

Mr. Gould tells me that he now considers the Central-American form of this bird to be distinguishable from southern examples. The distinction is indeed slight; but, so far as I can see, southern examples always have the blue of the head and throat considerably deeper in tint.

Heliothrix barroti.

Boqueti de Chitra; Bugaba; V. de Chiriqui.

I fail to detect amongst the species forwarded by Arcé from the above localities any specimens answering to the species described by



Hamilton, Edward. 1870. "March 24, 1870." *Proceedings of the Zoological Society of London* 1870, 157-219.

<https://doi.org/10.1111/j.1469-7998.1870.tb00461.x>.

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