

southwards from Hudson's Bay alone to the warmer latitudes. I cannot form an opinion of the comparative numbers to the westward, that is to say, of the Geese that leave the Arctic coast and wend their way straight to their winter quarters without touching the Bay at all; but supposing it to equal the flight of the body already mentioned, we shall then have 720,000, or perhaps say 800,000 Geese leaving the coasts east of the Rocky Mountains for their places of hybernation:—the Brant Geese are not included. This may be supposed much underneath the true estimate, yet I would not wish to give a greater; for although the swarms of Geese passing appear at times prodigious, yet, like many other scattered objects, when they come to be collected and counted, they become subject to a moderate figure. Say that Geese fly about a yard apart: this would make a winged string of life 450 miles in length; and suppose the rate of flight was 40 miles per hour, and the line led by one going straight south, they would take eleven hours in passing any given object.

Michipicoton, Dec. 6th, 1859.

XXXII.—*Notes on the Humming-birds of Guatemala.*

By OSBERT SALVIN, M.A., F.Z.S.

THE following notes relate to species of Humming-birds observed in Guatemala, at Dueñas, Coban, and Salamá, during the months of August, September, October and November 1859.

The references to each species will be found in the previous papers on the Ornithology of Central America published in this Journal.

As I have collected many examples of the several species of Humming-birds, I take the opportunity of illustrating, by actual figures, the ratio in numbers the males bear to the females, and give under each separate species that ratio, as shown by the specimens before me.

It may be from not having hit upon the localities for the opposite sex, that I have found one, be it male or female, usually largely predominating; yet it seems somewhat strange that the localities in which I have worked should have been, with few exceptions, those in which the males most abound. I will not

raise an hypothesis on this subject upon the facts that I have, up till now, collected, but merely state the numbers, and wait for further investigations.

1. PHAËTHORNIS ADOLPHI.

Coban, Vera Paz. November 15th.

Though not common about Coban, this species seems pretty generally dispersed. Like many others, it feeds among the *Salviæ*. To a practised ear its presence may be detected by the peculiar hum of the wings. This at once warns the collector to look out sharply among the lower branches and flowers, which are well searched by this bird, while the upper shoots of the bush are comparatively neglected. At Yzabal, where *P. adolphi* abounds, its habits somewhat differ. This is probably owing to the very different nature of the plants from which it takes its food, rather than to any other cause. If the females are to be distinguished from the males by their yellower throat, the ratio of the sexes is two females to seven males.

2. CAMPYLOPTERUS DELATTRII.

Coban, Vera Paz. November 1859.

The large size and showy tail of this Humming-bird make it one of the most conspicuous when on the wing. It is common at Coban, feeding among the *Salviæ*. It is said also to be found in the Volcan de Fuego, but I have not yet met with it. The females of this species are most abundant, their ratio to the males being as five to two. *C. delattrii* is not nearly so shy as its congener, *C. rufus*.

3. CAMPYLOPTERUS PAMPA.

Coban. November.

A single female specimen only was brought to me while at Coban.

4. PETASOPHORA THALASSINA.

Volcan de Fuego. September 6th.

The barrancos of the Volcano are favourite resorts of this species.

Dueñas, September 15th. A specimen obtained on this day is the only one I have seen out on the llaño, as the bird is usually found in the dense forest.

5. PETASOPHORA DELPHINÆ.

Coban, Vera Paz. November.

This Humming-bird seems to have been quite unknown at Coban previously to the present specimens being collected. The first was shot by my collector, Cipriano Prado, among some *Salviæ*, in one of the mountain-hollows near Coban. I afterwards visited this place and saw one bird, but did not succeed in shooting it. *Salviæ* being in flower in November, their blossoms are sought after by nearly every species of Humming-bird near Coban, this among the rest. It is a rare species even at Coban, and though much looked for by the Indian boys in consequence of my offers of reward, but few specimens were obtained.

The females appear only to differ from the males in being smaller in size, the colouring of the ear and throat being quite as brilliant. Three males to one female appears to be about the proportion of the sexes.

6. CYANOMYIA CYANOCEPHALA.

Dueñas and Coban.

This species is common at Dueñas, but its numbers at Coban are very much smaller. The sex of the young males seems sufficiently indicated by the colouring of the head.

7. EUGENES FULGENS.

Dueñas, Coban, and Tactic.

This species is also rare at Coban. The place described as frequented by *Amazilia dumerillii* is the spot where I have found this species in greatest numbers ; indeed, with two exceptions, I have never met with it elsewhere near Dueñas. It is a most pugnacious bird. Many a time have I thought to secure a fine male, which I had perhaps been following from tree to tree, and had at last seen quietly perched on a leafless twig, when my deadly intention has been anticipated by one less so in fact, but to all appearances equally so in will. Another Humming-bird rushes in, knocks the one I covet off his perch, and the two go fighting and screaming away at a pace hardly to be followed by the eye. Another time this flying fight is main-

tained in mid air, the belligerents mounting higher and higher, till the one worsted in battle darts away, seeking shelter, followed by the victor, who never relinquishes the pursuit till the vanquished, by doubling and hiding, succeeds in making his escape. These fierce raids are not waged alone between members of the same species. *Eugenes fulgens* attacks with equal ferocity *Amazilia dumerillii*, and, animated by no high-souled generosity, scruples not to tilt with the little *Trochilus colubris*. I know of hardly any species that shows itself more brilliantly than this when on the wing; yet it is not to the midday sun that it exhibits its splendour. When the southerly wind brings clouds and driving mist between the volcanos of Agua and Fuego, and all is as in a November fog in England, then it is that *Eugenes fulgens* appears in numbers; *Amazilia dumerillii*, instead of a few scattered birds, is to be seen in every tree, and *Trochilus colubris* in great abundance. Such animation awakes in Humming-bird-life as would hardly be credited by one who had passed the same spot an hour or two before; and the flying to and fro, the humming of wings, the momentary and prolonged contests, and the incessant battle-cries seem almost enough for a time to turn the head of a lover of these things. I have fifteen males from Dueñas to one female, which I shot, but did not skin,—one male from Coban, and two males from Tactic.

A "London fog" must not be understood here, as the yellow element is entirely wanting.

8. MYIABEILLIA TYPICA.

Volcan de Fuego (September 6th) and Coban.

The barrancos of the Volcano are the only localities I am aware of, near Dueñas, where this species is found. There, however, it is a common bird. It is usually to be seen feeding about the brushwood, seeking the flowers, &c. It is a restless species, but shows little symptoms of fear.

My skins from the Volcano are one female and three males. The proportions at Coban are very different. Here it is common, being found in all the mountain-hollows, feeding among the *Salvia*. The ratio of the sexes is as twenty males to one female.

9. DELATTRIA VIRIDIPALLENS.

Volcan de Fuego. September 18th.

This Humming-bird seems to keep entirely to the forests of the Volcano. I have never met with it in the plains below.

During the months of August and September, the localities of the various species of Humming-birds are usually as follows:— Among the trees on the south-eastern side of the lake are *Amazilia dumerillii*, *Thaumastura henicura* (mostly females), *Campylopterus rufus*, *Heliomaster longirostris*, *Chlorostilbon osberti* (in small numbers), *Cyanomyia cyanocephala*, and *Trochilus colubris*.

On the hill-side to the south-westward of the lake are great numbers of *Campylopterus rufus*, and among the willows close to the water the males of *Thaumastura henicura* congregate. About the Convolvulus-trees in the llaño at the foot of the Volcano are found *Eugenes fulgens*, *Amazilia dumerillii*, *Thaumastura henicura* (in small numbers), *Trochilus colubris* (very commonly towards the end of September), *Cyanomyia cyanocephala*, *Heliomaster longirostris* (rarely occurring).

Entering the first barranco that opens out into the plain, we meet with *Campylopterus rufus*, *Myiabeillia typica*, *Heliopedica melanotis*, and, a little higher up, *Petasophora thalassina* and *Delattria viridipallens*. Of course, occasionally a species is found not in its place as here indicated; for instance, I have seen in the first locality a single specimen (the only female I have met with) of *Eugenes fulgens*, and another high in the Volcano. I have also seen a single *Petasophora thalassina* out on the llaño. These localities must therefore be taken as only generally indicating the distribution of the species found about Dueñas.

This is one of the commonest species at Coban. It may readily be recognized by the peculiar harshness of its note.

10. HELIOMASTER CONSTANTI.

San Gerónimo.

A single specimen was brought to me by a boy. I never saw the species myself at San Gerónimo.

11. HELIOMASTER LONGIROSTRIS.

Dueñas.

The white sides and the white spot on the back show very conspicuously as this bird rests on its perch.

12. THAUMASTURA HENICURA.

Dueñas. August.

The Humming-birds' nests near the house at Dueñas, in the year 1859, met with singular misfortune. Without looking especially for them, I found three of *Cyanomyia cyanocephala*, three of *Thaumastura henicura*, and one of *Campylopterus rufus* close by, besides others more distant. Of these seven, one only, or perhaps two pairs, succeeded in rearing their young. The three nests of *C. cyanocephala* were all in the Cypress-trees. The first I took; the second was destroyed by some Indians after the eggs had been incubated for some time; the third remained unmolested, but I was not able to ascertain whether the young birds were reared. The nest of *C. rufus* was also in one of the Cypress-trees, at a height of about 5 feet 6 inches from the ground. It had two eggs when I found it; but the day following, eggs, nest, and the branch on which it was placed, were destroyed by some Indians who were working near. I am unable therefore to describe accurately the construction of the nest of this last species, and can only remark that the old bird, most probably the female, allowed me to approach very closely—indeed, so near that my head was within a foot of her. Of course I was obliged to tread softly and slowly, and to keep my eyes steadily fixed upon her. This tameness was a strong contrast to the usually shy habits of this species.

Two out of the three nests of *T. henicura* met with no better fate than those just mentioned. One of these two was in a Coffee-tree, and had two eggs. These were destroyed by some means or other, soon after the hen bird had begun to sit. The other nest of the two was most curiously placed in the cup-shaped top of a fruit of the Nopal (*Cactus cochinellifer*), the fastenings being dexterously wound round the clustering prickles, and thus retaining the whole structure most firmly in its place. This nest was remarkably shallow; so much so, that, if it had not contained its two eggs, I should have pronounced it far from complete. It may be that, being based on a firm foundation

(one not nearly so liable to oscillation by the wind), the bird had found that a greater depth was not necessary to keep the eggs from falling out. Had she placed her nest on a slender twig, such a one as seems to be the usual position chosen, the case might have been different. The third nest had young. It was placed in the upper shoots of a Dahlia which grew at the further end of the court-yard of the house. The hen bird seemed to have the entire duty of rearing the young, as I never once saw the male near the place; in fact, I never saw a male *T. henicura* inside the court-yard at all. When the hen was sitting she would sometimes allow me to go quite close to her, and even hold the branch still when it was swayed to and fro by the wind, without evincing the slightest alarm. But it was only when a hot sun was shining that she would allow me to do this; when it was dull or raining, four or five yards was the nearest I could approach. Frequently when I had disturbed her I would sit down close at hand and wait for her return, and I always noticed that, after flying past once or twice overhead, she would bring a small piece of lichen, which, after she had settled herself comfortably in her nest, she would attach to the outside. All this was done with such a confident and fearless air, that she seemed to intimate, "I left my nest purely to search for this piece of lichen, and not because I was afraid of you." When sitting upon her nest the whole cavity was quite filled by her puffed-out feathers, the wings, with the exception of their tips, being *entirely concealed* by the feathers of the back. When the young were first hatched, they looked little, black, shapeless things with long necks and hardly any beak. They soon, however, grew, and entirely filled the nest. I never saw the old bird sitting after the young had emerged from the eggs; she seemed to leave them alike in sun and rain. When feeding them, she would stand on the edge of the nest with her body very upright. The first of these young ones flew on October 15. It was standing on the side of the nest as I happened to approach, when it immediately flew off, but fell among the flowers below. I placed it again in the nest, but a moment after it was off again, nothing daunted by its first failure,—this second time with better success, for it flew over a wall close by and settled on a tree on

the other side. In the evening of the same day, I saw the old one feeding it, and went up to the tree; but it started off with increased vigour to an orange-tree, and tried at first to rest on one of the fruit, but failing, found a more appropriate perch on the edge of a leaf. I never saw it afterwards.

The other young one flew on October 17th, two days later. The proportion of males to females, of my Dueñas skins, is as five to three, while of those from Coban, as three to five.

The seeds of the willow and bulrush are favourite materials for the interior structure of the nest of *T. henicura*, while lichen is freely used outside.

13. SELASPHORUS HELOISÆ.

Volcan de Fuego and "tierra caliente" N. of Coban.

Two birds were given to me by Don Vicente Constancia, who had just received them from a place called Chimachoyo, near Calderas in the Volcan de Fuego. Two specimens I have in my collection from Coban were shot in the tierra caliente north of that city. Hence it would appear that this, like many other species of Humming-birds, is found in very different climates.

14. TRYPHÆNA DUPONTI.

San Gerónimo. December 10th.

Don Vicente Constancia assures me that this species is found near the city of Guatemala; otherwise this is the only locality I have been able to discover, as yet, where it occurs.

Following the course of the river of San Gerónimo up its bed to a distance of about half a league from the village, you come upon a small patch of forest with here and there open spots covered with *Salvia*. Here it was that this bird was shot by a boy, who told me there were plenty; however, on visiting the place soon after, I was not successful in obtaining more specimens, nor was I fortunate enough to see one.

15. TROCHILUS COLUBRIS.

Dueñas and Coban.

The 24th of August was the day on which I first met with this little wanderer from the North. I was shooting some specimens of *Eugenes fulgens* in the locality mentioned for *Amazilia dumerillii*, when I saw and shot a male in one of the

Convolvulus trees. From that date the numbers rapidly increased until the first week in October, when it became by far the commonest species about Dueñas. My first impression on seeing this bird was that it remained in small numbers to breed in this country; but on observing the increasing numbers, I soon relinquished the idea, though it was a natural one, as, at the time of my observing the first bird, in a locality previously unvisited, I was fully aware that *Campylopterus rufus*, *Thaumastura henicura*, and *Cyanomyia cyanocephala* were either building, or sitting on their eggs. Another proof also that *T. colubris* was not engaged, or about to engage, in domestic duties, was that whereas the resident species in the month of October wore their most brilliant plumage, that of *T. colubris* was tarnished and its lustre gone. The species seems to be very universally distributed; I found it common at Coban, also at San Gerónimo and the plains of Salamá. Of my skins from Dueñas the proportion of males to females is as one to four, but those from Coban exactly as one to one.

16. LOPHORNIS HELENÆ.

Coban. November 17th.

It was interesting to find that the recollection of M. Delattre's visit to Coban was still cherished by the bird-collecting community of that town. In fact he seems to have started the idea of collecting, and ever since there have been persons there who have handed down his original instructions in bird-skinning, so that, from preparing a few Quesals (*Pharomacrus paradiseus*), the Cobaneros have become somewhat celebrated for having formed the various collections which have from time to time been forwarded to Europe from their neighbourhood.

Mr. Gould, in his great work on Humming-birds, gives as a locality for this species "Petinck" (*Peten*?) in the Vera Paz. In the vicinity of Coban itself it is not uncommon, though hardly to be called numerous, and it is most probable that Vera Paz skins have usually been forwarded from this latter place. I was greatly delighted to find myself in the localities of this wonderful little bird—a success I had hardly hoped for, and I made every endeavour during my short stay both to see the bird in its living state and to get specimens.

On my first arrival in Guatemala the different species of Humming-birds seemed for some time to be alike in their habits, cries, and in the sound produced by their wings. Further acquaintance, however, and constant attention to their peculiarities, soon led me to detect an individuality in the different species, so that, after a time, I was able to name a species at a glance, or, if unseen, with hardly less certainty, from the sound of the wings or cry of the bird. These are differences not to be described accurately in words—at least only in the case of those most apparent. The cry of *Lophornis helenæ* is peculiarly shrill, and unlike that of any other species I know, hence its presence may be noticed if only the cry of a passing bird be heard. It feeds among the *Salviæ* that so abound in the mountain-hollows about Coban, and it is said also to show a partiality for the flowers of the *Taxisco*, when that tree is in full bloom in the month of December. In the month of November females of this species are very rare. Of the specimens I collected there was only one female to seventeen males.

In the Indian language of Coban, *Lophornis helenæ* has, besides the name "*Tzunnun*," which is applied to all the small Humming-birds, the additional name of "*Achshukub*." The Spanish name is "*El Gorrion Cachudo*"—the Horned Humming-bird.

17. AMAZILIA CORALLIROSTRIS.

San Gerónimo. December.

This is a common species about San Gerónimo. It seems not to be found in the colder and more elevated portions of the Republic, neither occurring at Dueñas nor Coban, but it is very plentifully distributed throughout the Pacific coast-region. It shows a great partiality for the blossoms of the orange and the lime. A nest with two young and the hen bird were brought to me December 6th; the young were half-grown, and would have flown in about ten days. Finding unfledged birds thus late in the season, one is tempted to apply to Humming-birds the question of the entomologist, "*Is Gonepteryx rhamni double-brooded?*"

October is the month of all others that flowering plants and trees put forth their blossoms. It would seem that the nesting season of the Humming-birds is postponed after that of

other species, in order that, when the young birds make their first essay to provide for their own sustenance, the flowers of the forests and plains should be in greatest abundance. Hence, perhaps, it is that September is the month during which the Humming-birds of Guatemala are principally engaged in incubating their eggs and rearing their young,—a time when the young of other birds have long been able to shift for themselves. Perhaps also it would appear that a certain amount of experience is necessary for the young Humming-birds to obtain a regular supply of food, and that to gain this experience it is also necessary that the showy flowers should be in bloom to attract attention, enabling them with greater ease to obtain the requisites of life, until they learn where else their insect prey is to be found among the leaves and shoots.

Though September and the end of August are the months when the Humming-birds of Guatemala usually appear to build, they are not the only ones. In 1858 I found a nest of *C. cyanocephala* in June, and in 1859 one in July, and again a nest of *A. corallirostris* in December.

Other birds show extreme irregularity in their breeding seasons, so much so that one might find birds' nests all the year round. No suppositions respecting the seasons of two places deduced from the fact of the same bird being found breeding in two different months, can be safely inferred, the difference being so great in the same place.

My specimens of *A. corallirostris*, though not in excellent plumage, I think show that, as far as the feathers are concerned, the sexes are alike. A difference, however, exists in the bill, that of the male having much more of the brilliant colour, from which the species takes its name, in the upper mandible.

In the young bird the upper mandible is black. In speaking of this colouring of the bill, I may mention that it appears to be due to the transparency of the outer film of the bill allowing the blood to show through, and not to any especial colouring-matter. This seems to be the case also in many other species, as in *Chlorostilbon osberti*, *Heliopædica melanotis*, *Amazilia riefferi* and *A. dumerillii*, *Lophornis helenæ*, *Cyanomyia cyanocephala*, &c.; and I think it more than probable that where the bill of a dried

skin shows markings of a dull flesh-colour, that part has been coloured in the living bird with some shade of red. There are cases, however, where actual colouring matter is to be noted, in addition to the usual horn-black, as in *Phaëthornis adolphi*, where the basal half of the lower mandible is straw-colour.

18. *AMAZILIA RIEFFERI*.

Coban. November.

This *Amazilia* is found also at Yzabal. It is far from common at Coban. All my specimens appear to be males.

19. *AMAZILIA DUMERILLII**.

Dueñas. August.

During the months of July, August, and September, one of the most favourite resorts of this Humming-bird was the western boundary of the llaño of Dueñas, which, starting from the village, and bounded to the eastward by the river Guacalate, extends, sweeping by the base of the Volcan de Fuego, almost to the Hacienda of Capertillo, its southern extremity. Dispersed all over this plain is found, in groves, patches, and isolated trees, a Tree-*Convolvulus*, bearing a white flower, and attaining an average height of about 25 or 30 feet. During the above months, this elegant species might be seen in almost every tree, some feeding among the flowers, some settled quietly on a dead branch, uttering their low, plaintive, hardly to be called musical, yet certainly cheering song; others less peacefully occupied in a war of expulsion, driving out, by vehement cries and more effectual blows, the tenant of a tree, which in its turn wreaks vengeance on some weaker or unexpectant antagonist.

Of this species I have skins, of which the sexes are in the proportion of four males to one female.

20. *THAUMANTIAS CANDIDUS*.

This species, which is very abundant about Coban, is found also at Yzabal. Many species of Humming-birds in Guatemala extend through a great range of temperature, the same species

* This *Amazilia* I have previously called *A. arsinoë*; but upon comparing my specimens with Mr. Gould's numerous examples of the Mexican *A. arsinoë* (which I have been enabled to do through his kindness), I find it distinct, and correctly referable to *A. dumerillii*.

being frequently found both in the coast-regions and also in the more elevated districts.

Thus, *Phaëthornis adolphi* is found at Yzabal and Coban; *Amazilia dumerillii* at Yzabal and Dueñas; *Selasphorus heloisæ* at Cajabon, in the "tierra caliente" north of Coban, and at Calderas in the Volcan de Fuego; *Helimaster longirostris* near Guatemala (Constancia), Dueñas, and Escuintla (Constancia). Some species, however, seem to be much more restricted in their range.

The males of *T. candidus* largely predominate in numbers at Coban: of those actually dissected, the ratio is as seven males to one female; but, comparing these with the rest, the ratio becomes eleven to one.

21. HELIOPÆDICA MELANOTIS.

Volcan de Fuego, Coban, and San Gerónimo.

In some of the open savannas which are scattered among the oak-forests of the Volcan de Fuego near Calderas, this species is not uncommon; in some of the "barrancos" also of the same Volcano, I have frequently met with it.

The white mark running from the eye and the deep coral-red of the bill show conspicuously in the living bird. It is a very shy species.

A single bird was shot and skinned by Cipriano near Coban, and one specimen was brought to me from the mountains of S. Cruz, near San Gerónimo.

22. EUPHERUSA EXIMIA.

This is one of the commonest Humming-birds of Coban, being found everywhere near the city. The ratio of the males to the females is as ten to three.

23. CHLOROSTILBON OSBERTI*, Gould.

Dueñas and San Gerónimo. Not uncommon at San Gerónimo.

The only other species of *Trochilidæ* I have observed in Guatemala are—*Phaëthornis cephalus*, of the Vera Paz; *Campylo-*

* This name was given by Mr. Gould to a *Chlorostilbon*, very closely allied to *C. caniveti*, described at the Zoological Society's Meeting, June 12th, 1860.

pterus rufus, of Dueñas; *Lampornis prevosti*, of Escuintla; *Chrysura elicia*, of Coban; *Heliothrix barroti*, of the northern tierra caliente; and *Lamprolæma rhami*, of the Volcan de Fuego, making altogether twenty-nine species. Three others I have not been so fortunate as to meet with, namely *Florisuga mellivora*, of the northern tierra caliente, and *Delattria henrici* and *Selasphorus platycercus*, which are said to occur in the Volcan de Fuego, on Don Vicente Constancia's authority.

XXXIII.—*Contributions to the Ornithology of Guatemala.* By OSBERT SALVIN and PHILIP LUTLEY SCLATER. Part II.

[Continued from page 45.]

DURING the autumn of 1859 I collected, in the vicinity of Dueñas on the table-land of Guatemala, and near Coban and Salamá in the Vera Paz, about 870 specimens of birds, belonging to 245 different species, 39 of which are new to the fauna of this country, and have not been noticed in previous papers in this Journal relating to the ornithology of Central America. Of these I now give the names, as determined by Mr. Sclater and myself, together with my field-notes written concerning them at the time they were obtained, and some joint remarks on their synonymy and distribution.—O. S.

1. *TURDUS ASSIMILIS*, Cab.: Sclater, P. Z. S. 1859, p. 327.

Dueñas, August 1859. Two specimens were obtained in the above locality. I never met with *T. leucauchen*, Sclater, which appears to be common in the low lands of the northern portion of Vera Paz, in this part of Guatemala.

2. *TURDUS PALLASI*, Cab.: Sclater, P. Z. S. 1859, p. 325.

Coban, Vera Paz, November 1859. A single specimen, apparently of this species.

3. *CYPHORINUS PROSTHELEUCUS* (Sclater). *Scytalopus prosthaleucus*, Sclater, P. Z. S. 1856, p. 290.

Volcan de Agua, January 1860. A single specimen, obtained at an elevation of about 6500 feet, agrees nearly with Mexican skins of this bird in Sclater's collection.