INTRODUCTION.

THE earliest record respecting the existence of a species of the remarkable group of birds now so well known by their common appellation of Toucans, occurs in the 28th Chapter of Belon's third book published in 1555, where a figure of the bill of *Ramphastos Toco* is given as belonging to a bird of the new world. The beak of another species also formed part of the celebrated collection of John Tradescant, and was described in the "Museum Tradescantium," published in 1656, as that of the Araçari of Brazil. The first figure of an entire bird appeared in the "Ornithologia" of Willughby under the name of *Pica Braziliensis Toucan*, but is so imperfect that we can scarcely say what species it is meant to represent; most likely, however, it is intended for the *Ramphastos Toco*: subsequently a correct but very rude figure of another species, probably the *Ramphastos erythrorhynchus*, was published in Petiver's "Gazophylacii Naturæ"; and to these meagre materials but little appears to have been added until the appearance of the "Systema Naturæ" of the celebrated Linnæus, in the twelfth edition of which he enumerates eight species; but of these *R. picatus* cannot be identified, and the *R. Momotus* has nothing whatever to do with the present family, but is a true Motmot—genus *Momotus*: six species then were all that were known to Linnæus. Gmelin, in his edition of the "Systema Naturæ," enumerates eight others, but of these *R. pasoninus*, *torquatus*, *luteus*, *cæruleus*, and *albus* cannot be identified, and *R. erythrorhynchus* is probably identical with the *R. Tucanus* of Linnæus; his *R. Toco*, according to the characters detailed, is therefore the only addition made by him to the previous list. Illiger appears to have added *R. vitellinus*; at least Mr. Swainson quotes that name as having been given by him, but does not say where, nor have I been able to discover his description of the species. Dr. Shaw proposed the name of *R. Aldrovandi* for the *R. picatus* of Linnæus, which I have already mentioned cannot be identified. Vieillot merely Latinized the French names given by

Le Vaillant to three of the species figured in his "Oiseaux de Paradis," viz. *Ramphastos Tocard*, *R. Azaræ*, and *R. Bailloni*. Mr. Swainson made us acquainted with three additional species, *Ramphastos ambiguus*, *Pteroglossus inscriptus*, and *Pt. sulcatus*. Dr. Lichtenstein gave the names of *Pteroglossus prasinus* and *Pt. maculirostris* to two well-marked species. Dr. Latham did not add a single species to the group; unless his Blue-eared Toucan, to which he gave no specific appellation, be identical with *Aulacorhamphus sulcatus*. The *Ramphastos Indicus* of Miller's "Cimelia Physica" is doubtless meant to represent a Toucan; and if the colours of the under surface were transposed it would then more nearly resemble *R. Toco* than any other.

Wagler, who gave a monograph of the group in his "Systema Avium," published in 1827, added the following species,—*Ramphastos Cuvieri* and *Pteroglossus Reinwardti*, *Langsdorffi* and *Humboldtii*. Subsequently he published in Oken's "Isis" the description of a fifth new species under the name of *Pteroglossus Beauharnaisii*. His *Ramphastos Le Vaillantii* is merely the description of the faded *R. erythrorhynchus*, figured by Le Vaillant on his fourth plate; his *Ramphastos callorhynchus* is identical with the *R. carinatus* of Swainson; his *R. Forsterorum* is taken from the fifth plate of Le Vaillant, which is said to be a representation of a bird made up from *R. Ariel* and *R. Cuvieri*; his *R. erythrosoma* cannot be identified with any known bird; the characters were taken from Le Vaillant's sixth plate representing a specimen which had probably been tampered with by the bird-mounter, a much to be reprehended, though not unfrequent practice; lastly, his *Pteroglossus Poëppigi* is identical with his *Pt. Beauharnaisii*.

Both Prince Charles Lucien Bonaparte and Mr. G. R. Gray consider the *Ramphastos maximus* of Cuvier to be identical with the *R. erythrosoma* of Wagler, which, as above stated, has been founded upon a made-up specimen.

Mr. Vigors, who commenced a monograph of the family in the "Zoological Journal," but did not live to complete it, named two others, *Ramphastos Ariel* and *Pteroglossus bitorquatus*.

Mr. Fraser pointed out the characters which distinguish his *Pteroglossus flavirostris* from the true *Pt. Azaræ* for which I had mistaken it.

During my absence in Australia Mr. Waterhouse described a fine new species as *Pteroglossus nigrirostris*, the bird almost simultaneously receiving the appellation of *Pt. melanorhynchus* from the Messrs. Sturm of Nuremberg.

M. Natterer, who has furnished us with so much valuable information respecting this group, named two new species *Pteroglossus Gouldi* and *Pt. Sturmi*.

M. Boissoneau has added to the list *Pteroglossus albivitta*; and

M. d'Orbigny *Pteroglossus cæruleocinctus*.

The Messrs. Sturm, in their German translation of the first edition of this work, have published two others, *Pteroglossus atrogularis*, and *Pt. Wiedi*.

The following are the species which I have had the pleasure of making known as additional members of the family:—

Ramphastos brevicarinatus.

——— *Inca*.

——— *citreolæmus*.

——— *osc ulans*.

——— *culminatus*.

Pteroglossus pluricinctus.

——— *pæcilosternus*.

——— *castanotis*.

——— *erythropygius*.

Pteroglossus Mariæ.

Andigena laminirostris.

——— *hypoglaucus*.

——— *cucullatus*.

Selenidera Nattereri.

Aulacorampus Derbianus.

——— *castaneorhynchus*.

——— *hæmatopygius*.

——— *cæruleogularis*.

The characters and figure of the *R. citreopygius* of my former edition were taken from a specimen at that time in the possession of Mr. Swainson, but which, with the remainder of his collection, is now in the Fitzwilliam Museum at Cambridge. Upon again examining it, and with greater care than upon the former occasion, I find that it is made up of the head of *Ramphastos vitellinus* and the body of *R. erythrorhynchus*; consequently that name must be expunged from the list of the species of this family.

Having thus traced the discovery of the various members of this important group from the earliest period down to the present time, I now proceed to speak of their affinities, the countries they inhabit, and the extent of their range; as well as to give all the information I have been able to obtain respecting their habits and economy, duly acknowledging the sources whence it has been derived.

In some parts of their structure the Toucans much resemble the Hornbills; like them they are distinguished by the great development of the beak, by the scantiness of the plumage of the body, and by the rich colouring of the denuded parts of the skin; both are impatient of cold, and both seem especially adapted for a tropical or subtropical climate; both are said to incubate in the holes of trees, and they are, moreover, very much alike in their general habits and actions; even to the positions they assume while roosting, when both sit with the tail turned upward over the back. In the structure of their feet,

however, they are totally different; the toes of the Toucan being placed two before and two behind, while the foot of the Hornbill is of a broad palmated form, with three large partially united toes before and a more feebly developed one behind: still, although so nearly allied, the two groups constitute two distinct families, representing each other in the respective countries they inhabit; the Hornbills dwelling in Africa, India and its islands, and the Toucans in tropical America. South America then is the true habitat of this group, and the forests bordering the mighty Amazon the centre whence they diverge on either hand. It is there that we find the greatest number of species, and there every generic form is represented. From this central stronghold they range as far south as Paraguay and Bolivia; and their progress northward is not bounded by New Grenada, several species inhabiting the Isthmus which connects Southern with Central America, and two even extending their range as far as Mexico. The forests of the Andes and the Cordilleras also afford to several species a congenial place of abode. Some frequent the humid woods of the temperate regions, while others resort to the comparatively colder districts, and dwell at an elevation of from six to ten thousand feet; those inhabiting the lofty regions are generically different from those residing in the lowlands, and are clothed in a more thick and sombre-coloured plumage; all the members of the genus *Andigena* are thus distinguished, as well as by their bills being strong, heavy and hard when compared with those of the true Toucans and Araçarís, all of which have bills of a more delicate structure, and in several species so thin and elastic on the sides as to be compressible between the fingers.

Considerable diversity of opinion exists as to the peculiar uses for which the disproportionate bills of these birds are especially adapted, and as to the nature of the food upon which they subsist; some writers stating that they are strictly frugivorous, and that they never partake of animal food; while others affirm that they are quite omnivorous: my own belief is that fruits are, strictly speaking, their natural food, but that occasionally, as is the case with the Parrots and many fruit-eating birds, animal food is necessary to their well-being, and is then freely eaten: I have had many opportunities of observing that such is the case in a state of confinement, in confirmation of which I would refer to the interesting account by Mr. Broderip given with the description of *Ramphastos erythrorhynchus*. In this semi-domesticated state they will even eat mice, caterpillars, small birds, and flesh of any kind, especially raw beef; and I have little doubt that they would also eat fish if offered to them: Humboldt states, indeed, that the Toucan loves to fish on the banks of rivers, and it was doubtless some report of this kind that induced Linnæus to give the name of *piscivorus* to a species of this family; but I apprehend that in this particular both these celebrated men have been misinformed, for, as I have before said, I have every reason to believe that in a state of nature fruit is their principal food, the larger species, such as the *Toco* and the other members of the restricted genus *Ramphastos*, feeding upon Bananas and other succulent kinds, while the *Pteroglossi* and the Toucanets mainly subsist upon the smaller fruits and berries.

Many interesting notes respecting these birds have been published by travellers who have explored South America, and I cannot perhaps do better than give them in their own words; for although uncon-

nected, they will convey a more lively idea of the habits and economy of this group of birds, than could be obtained from a condensed account derived therefrom; at the same time I must remark that on some points they are very contradictory.

The Prince Maximilian of Wied, who has kindly forwarded to me some valuable notes on the Brazilian species observed by him during his travels in that part of South America, says, "The *Ramphastidæ* are very common in all parts of the extensive forests of the Brazils, and are killed in great numbers at the cooler portion of the year for the purposes of the table. To the stranger they are of even greater interest than to the natives, from their remarkable form and from the rich and strongly contrasted style of their colouring; their black or green bodies being adorned with markings of the most brilliant hue—red, orange, blue and white; their naked orbits in some instances red, and in others green or blue; the naked parts of the body dyed with brilliant colours; the legs blue or green, the irides blue, yellow, &c.; and the large bill of a different colour in every species, and in many instances very gaily marked. The colouring of the soft parts is, however, so evanescent, that, to determine the species with accuracy, they must be depicted during life or immediately after the birds are killed. Common as these birds are in their native wilds, it is exceedingly difficult to detect their breeding places; it is certain that they deposit their eggs in the hollow limbs and holes of the colossal trees so abundant in the tropical forests, but I was never so fortunate as to discover them. The stomachs of the specimens I examined contained nothing but the remains of fruits, principally of the softer kinds, for which indeed they have such a liking that they resort in great numbers to the plantations in the vicinity of their native haunts and commit sad havoc among their favourite delicacies. I was informed that they frequently steal and eat young birds, but no instance of their so doing came under my own observation, and I never detected the remains of animal food in their stomachs: Mr. Waterton's opinion agrees with mine, that they feed solely upon fruits; but Azara, among others, states that they also feed upon animal substances. The specimens we saw in a state of domestication were very voracious and perfectly omnivorous, but they seem to be purely frugivorous in a state of nature, a fact which was indeed confirmed by the Brazilian natives whom we questioned on the subject. In their manners the *Ramphastidæ* offer some resemblance to the *Corvidæ*, and especially to the Magpies; like them they are very troublesome to the birds of prey, particularly to the Owls, which they surround and annoy by making a great noise, all the while jerking their tails upwards and downwards. The flight of these birds is easy and graceful; and they sweep with facility over the loftiest trees of their native forests; their strangely developed bills, contrary to expectation, are no encumbrance to them, for a singularity of structure (the interior being replete with a tissue of air-filled cells) renders these organs very light and even buoyant. The voice of the *Ramphastidæ* is short and unmelodious, and is somewhat different in every species. Their feathers are used by the Indians for personal decoration, especially the yellow breasts of the birds, which they affix to their heads on each side near the temple, and also to the ends of their bows. The descriptions of these birds in the older authors are very incomplete and of little value, from want of knowledge relative to the colouring of their bill and soft parts; nor have they been correctly described in

many of the works more recently published. The species observed by me during my travels in Brazil, which extended from the 13th to the 23rd degrees of south latitude, or from Bahia to Rio de Janeiro, were *Ramphastos Toco*, *R. Ariel*, *Pteroglossus Wiedi*, and *Pt. maculirostris*."

Mr. Waterton remarks, that "While the *Cotingas* attract your attention by their superior plumage, the singular form of the Toucan makes a lasting impression on your memory.

"There are three species of Toucans in Demerara, and three diminutives which may be called Toucanets. The largest of the former frequents the Mangrove-trees on the sea coast. It is never seen in the interior till you reach Machauchia, where it is found in the neighbourhood of the river Tacatoa; the other two species are very common. They feed entirely on the fruits of the forest, and though of the Pie kind, never kill the young of other birds or touch carrion.

"The larger is called *Bouradi* by the Indians (which means *nose*), the other *Scirou*. They seem partial to each other's company, and often resort to the same feeding-tree, and retire to the same shady noon-day retreat. They are very noisy in rainy weather at all hours of the day, and in fair weather at morn and eve. The sound the *Bouradi* makes is like the clear yelping of a puppy dog, and you fancy he says '*Pia-po-o-co*,' and thus the South American Spaniards call him *Piapoco*. All the Toucanets feed on the same trees on which the Toucan feeds, and every species of this family of enormous bill lays its eggs in the hollow trees. They are social but not gregarious. You may sometimes see eight or ten in company, and from this you may suppose they are gregarious, but upon a closer examination you find it is only a dinner party which breaks up and disperses towards roosting time. You will be at a loss to conjecture for what end nature has overloaded the head of this bird with such an enormous bill; it cannot be for the offensive, as it has no need to wage war with any of the tribes of animated nature, for its food is fruits and seed, and those are in superabundance throughout the whole year in the regions where the Toucan is found. It cannot be for the defensive, as the Toucan is preyed upon by no bird in South America, and were it obliged to be at war; the texture of the bill is ill-adapted to give or receive blows, as you will see by dissecting it.

"The flight of the Toucan is by jerks; in the action of flying it seems incommoded by this huge disproportionate feature, and the head seems as if bowed down to the earth by it against its will. If the extraordinary size and form of the bill expose the Toucan to ridicule, its colours make it amends. Were a specimen of each species of Toucan presented to you, you would pronounce the bill of the *Bouradi* the most rich and beautiful one. It is worthy of remark, that all these brilliant colours of the bill are to be found in the plumage of the body and the bare skin round the eye."

I now give the account published by Azara, a man of great acumen and research, who studied closely the animals of South America, and whose works will always be held valuable.

"It is my intention to classify the *Tucans*, 'so called by the Guaranis,' amongst the diurnal birds of prey, although nature seems to have united in them a character and figure altogether opposed to a cruel and sanguinary appetite. They are nearly always gregarious, since it is usual to meet them in a family party or congregated in little troops.

"They have very short wings and a misshapen beak, incapable of the operations of bending, sawing or grinding. The legs cannot be advanced alternately, but only by forced jumps. The two hind-claws are quite useless for seizure, attack or defence.

"The Toucans, contrary to all appearances, destroy a great number of birds, and on account of their large and strong beak are respected and feared by all species. They attack and drive them from their nests, and in their very presence eat their eggs and young; these they draw from the holes with the long beak, or throw down nest and all together.

"It is credibly reported that the Toucans do not even respect the eggs or young of the 'Aras' and 'Caracaras;' and if the fledglings are too large or too strong to be lifted from the nest, they dash them to the ground, as if it were their nature not only to devour but to uselessly destroy.

"The solid nest of the White Ant, that resists the action of the weather and other destructive causes, is not proof against the Toucan's attack, for he waits until the clay of which the nest is formed is moistened by the rain, and then breaks it up with his beak so as to obtain the eggs and young ants; in fact during the breeding season the Toucan feeds upon nothing else; the rest of the year is for him a long fast, so strict, that he can only get fruits with sometimes a few insects and buds of trees, nor does he continue to annoy other birds. It is my opinion that the Toucans are unable to catch adult birds; but supposing they were, their stomach would not be capable of digesting the feathers and bones, nor their bill of plucking and disjuncting. But in order not to deviate in any respect from the truth, I confess that I am not sure that the small species of Toucans do not break the nests and devour the young ones, because, being more rare than the others in Paraguay, I have not been able to verify the fact, although I do not doubt it; for having the same form and the same manner of living, they must have the same habits.

"In the first two species the bill is out of all proportion. The bird in flying presents the point of it to the wind, so that it does not offer more resistance than that of other birds in which the head and superficies are equal in extent; besides which, the conformation and specific lightness of this long beak cannot impede flight, because the highest points of the bird being the bill itself and the anterior portion of the body, they form no obstacle, the wind first taking effect upon the point of the bill: when in a state of repose, the Toucan carries its bill rather more elevated than a horizontal line that would pass through the eyes, and when closely looked at it appears like a false bill, because its base exceeds the breadth of the head, which presents the appearance of being enclosed in a case.

"In addition to these singularities, the nostrils are placed behind the aforesaid base.

"The tongue is very narrow and of an equal thickness throughout; it is entirely osseous, and resembles somewhat a feather two lines in width furnished with an osseous fringe, which is directed from

behind forwards, so that the tongue, stiff and unyielding, takes no part in the direction of the food, nor in the formation of the note, which, in the first two species, is confined to the single syllable 'rac.'

"The mandibles are very distinctly dentated at their edges; these dentelations not corresponding at all above and below, nor are they even relatively symmetrical. The beak itself is a thin osseous sheath filled with a number of empty cellules.

"The eye is large and surrounded by a triangular naked space, puffed up and very pretty.

"The foot is very short and stout, and covered nearly to the heel with long scales, harsh to the touch. The outer toe, as well before as behind, is the longest. The claws are much flattened and curved, as in the Woodpeckers. The tail is composed of ten feathers.

"The Toucan flies at a moderate height and in a straight horizontal line, flapping its wings occasionally with some noise. The flight is quicker than the smallness of the wings would lead one to believe. It perches towards the top of the highest trees, and although unable to climb after the manner of Woodpeckers, it still progresses with speed, hopping from branch to branch. It pays great attention to all that takes place in its vicinity, advancing with fear and diffidence, like the 'Uruca' and the 'Acahes'.

"There is no perceptible difference between the two sexes, nor do I believe that the species exists towards the south beyond 28°, nor that it drinks; it rarely settles on the ground.

"The first species (*R. Toco*) is not rare; it is found near habitations and in the woods, but never in the fields.

"As regards its nidification, it builds in the holes of trees, and hatches two young ones, closely resembling the adults, which feed them until they are able to fly. I have observed that young birds reared artificially always die at the end of two or three months.

"The Toucan hops obliquely and very awkwardly, with the legs separated almost a hand's breadth.

"When it takes young birds from the nest, pieces of meat or fruit, it throws them in the air, as a juggler his balls, and by a quick movement of the beak, repeats this action until the food is in a favourable position for being swallowed, and then by another movement gulps it down its large throat.

"If the mouthful be larger than the orifice of the gullet, the Toucan abandons it without seeking to divide it.

"It is not known how the reproduction of the small species takes place, but it is probably similar to that of the others.

"Buffon has given a beautiful preface to his description of the Toucans, but he is mistaken in thinking that the name of these birds signifies 'feather' in the Brazilian language, and that they have been so called because in lieu of a tongue they have a feather of a cartilaginous (or as it seems to me osseous) substance. He is also in error in stating that the bill is both useless and an encumbrance, since it serves as an offensive weapon, and does not impede their flight nor weigh down the head. The flight of the Toucan, on the contrary, is tolerably swift, and by no means awkward or embarrassed, the beak and head being the most elevated parts. Buffon erroneously states also that Toucans perch upon the tops of trees, are easily tamed,

and breed in captivity; and lastly, that their cry is a kind of reiterated whistling, procuring for them the name of 'Oiseaux Prédicateurs' (Preaching Birds).

"The same author asserts, from the report of Hernandez, that they have a habit of boring trees, but this is impossible. The mistake must have arisen from the fact of their having been seen at holes of trees, and thence abstracting the eggs or young of the Woodpecker or Parrot.

"Their physiognomy is neither sad nor serious, as Buffon affirms. They have simply an air of restlessness and mistrust.

"Fernandez and Nieremberg affirm that these birds prey upon fish, but I do not think this, although I consider it very likely that they may sometimes feed upon frogs, toads, and such like.

"Buffon supposes that they are erratic rather than migratory birds. On this subject I can say nothing, except that the large species is stationary, and according to all appearances the others are the same."

Humboldt states that he never observed the Toucan throw its food into the air before swallowing it, and adds that, having once seized it with the point of its enormous beak, it has merely to elevate it by throwing back the head and allow it to drop down the throat.

The following extract is from Edwards' 'Voyage up the Amazon':—

"Most noticeable of all these birds, both for size and peculiarity of form, are the Toucans. There are many varieties, appearing at different seasons; but the Red-billed (*R. erythrorhynchus*) and the Ariel (*R. Ariel*) are the largest and most abundant, seen at every season, but towards autumn particularly, in vast numbers throughout the forest.

"Their large beaks give them a very awkward appearance, more especially when flying; yet, in the trees, they use them with as much apparent ease as though they were, to our eyes, of a more convenient form. Alighted on a tree, one usually acts the part of sentinel, uttering constantly the loud cry *Tucano*, whence they derive their name. The others disperse over the branches in search of fruit.

"We had been told that these birds were in the habit of tossing up their food to a considerable distance, and catching it as it fell; but as far as we could observe, they merely threw back the head, allowing the fruit to fall down the throat. We saw, at different times, tamed Toucans, and they were never seen to toss their food, although almost invariably throwing back the head. This habit is rendered necessary by the length of the bill and the stiffness of the tongue, which prevent their eating as do other birds.

"All the time, while feeding, a hoarse chattering is kept up, and at intervals they unite with the noisy sentry, and scream a concert that may be heard a mile.

"Having appeased their appetites, they fly towards the deeper forest, and quietly doze away the noon. Often in the very early morning a few of them may be seen sitting silently upon the branches of some dead tree, apparently awaiting the coming sunlight before starting for their feeding-trees.

"The nests of the Toucans are represented in works of Natural History as being constructed in the

hollows of trees. It may be so in many cases and with some species. The only nest we ever saw, which was of the Toco Toucan, was in the fork of a large tree, over the water, upon the Amazon.

"Toucans, when tamed, are exceedingly familiar, playful birds, capable of learning as many feats as any of the Parrots, with the exception of talking.

"When turning about on their perch, they effect their object by one sudden jump. They eat anything, but are particularly fond of meat.

"When roosting they have a habit of elevating their tails over their backs. The beaks of the Red-billed Toucans are richly marked with red, yellow, and black; but preserved specimens soon lose their beauty.

"The other varieties found near Pará are the *Pteroglossus maculirostris* (Licht.), the *P. bitorquatus* (Vig.), and the *P. viridis*."

But few notes have been written on the Toucans of the Pacific side of America; I find, however, the following in the 'Zoology of the Voyage of the Sulphur,' by the late R. B. Hinds, Esq. :—

"In our examination of the west coast of America from south to north, the *Ramphastidæ* were first seen at Atacames, which is a little south of the equator; and they were subsequently often noticed at the different places touched at as far as the Gulf of Fonseca, in 13° 17' N. Lat. This is, however, most certainly not their geographical limit, and probably not even on the coast."—Zool. of Voy. of Sulphur, p. 46.

Latham and some of the older authors mention a Preacher Toucan, but which species is intended is by no means clear. The name may possibly have arisen from the following note in the 42nd volume of the Gentleman's Magazine, p. 505 :—

"The genus is confined to the hotter parts of South America; near Carthagena is found a bird called Preacher, from the custom of its perching above its companions, and with a ridiculous motion of its head, attended with its harsh note, as it were uttering a discourse."

By Linnæus and the older writers, all the members of this group known to them were comprised in the single genus *Ramphastos*. In the year 1811, however, Illiger separated the smaller and more elegantly-formed species, popularly known as *Araçaris*, into a distinct genus, to which he gave the name of *Pteroglossus*. Since that period we have acquired a much more extensive acquaintance with the subject, and we find that a still further subdivision of the family is necessary; indeed they appear to be naturally divided into five or six distinct sections or genera, each having well-marked characters not found in any of the others. The genus *Ramphastos* of Linnæus must of course be retained for the Toucans, distinguished by their large and gaily-coloured bills, and the black colouring of their plumage; in like manner Illiger's genus *Pteroglossus* is retained for the *Araçaris*, birds having a more elegant contour, and whose bodies are clothed in green above and yellow and red beneath. In both these sections the sexes are alike in colour.

The next section in point of affinity comprises the beautiful Amazonian group of Banded Araçaris, figured under the names of *Pteroglossus Beauharnaisii*, *Pt. Azaræ*, *Pt. flavirostris*, *Pt. Mariæ*, *Pt. bitorquatus* and *Pt. Sturmi*, and for which the generic appellation of *Beauharnaisius* has been proposed by Prince Charles Lucien Bonaparte. In this section the females very closely assimilate to the males in colour, but differ in the lighter hue of the throat.

The fourth section, for which I have proposed the generic appellation of *Selenidera*, and the trivial one of Toucanets, is exceedingly well-marked; all its members are of small size when compared with the true Araçaris, have shorter and harder bills; shorter and less graduated tails; and are, moreover, distinguished by a crescentic mark of yellow at the back of the neck; by brilliant orange and yellow ear-coverts; and by a great difference in the colouring of the sexes.

The fifth division comprises the Hill Toucans, a group inhabiting the elevated portions of the Andes. They are all well-proportioned birds, have larger and harder bills than the *Selenideræ*; a thick but lax plumage; and are not banded on the under surface like the Araçaris. For this group I have proposed the generic name of *Andigena*.

The sixth and last division, constituting my genus *Aulacorhynchus*, altered by Mr. G. R. Gray to *Aulacoramphus*, comprises ten species distinguished by a nearly uniform grass-green style of plumage, the feathers composing which are long and loose, and by the bill being in some of the species grooved along the sides. The sexes are alike in colour.

For the true Toucans then I retain Linnæus' genus

RAMPHASTOS,

WITH THE FOLLOWING CHARACTERS:—

Rostrum maximum, tenue, culmine cultrato et versus apicem incurvo; basi margine incrassato, maxillæ angulo frontali, transversim subtruncato, *tomia* inæqualiter serrata; *nares* frontales, pone maxillæ basin sitæ; *orbite* nudæ; *lingua* mediocris, angusta, pennacea; *alæ* subelongatæ, concavæ; remigibus primis et secundariis ad apices in spatham angustam eductis; primariis sextâ et septimâ cœqualibus, et longitudine præstantibus; *cauda* æqualis; *pedes* scansorii; *digiti* externi internis longiores; *acropodia* scutulata.

Bill very large, thin; culmen sharp and curved down towards the tip; thickened on the margin at the base; serrated on the edges; *nostrils* placed behind the base of the bill; *orbits* naked; *tongue* long, narrow and

feather-like ; *wings* rather lengthened and concave ; first and second primaries with the tips prolonged into a narrow spatulate form ; the sixth and seventh primaries equal, and the longest ; *feet* scansorial.

The members of this genus are more widely distributed over South and Central America than those of any other section of the family ; for although it is in Brazil, and particularly in the forests clothing the delta of the Amazon, that the greater numbers exist, some of the species are found as far south as Paraguay ; and one as far north as Mexico. The warmer forests, both on the eastern and western sides of the Andes, are equally tenanted by them.

The species are :—

1.	Ramphastos Toco	Pl. I.
2.	———— carinatus	Pl. II.
3.	———— brevicarinatus	Pl. III.
4.	———— Tocard	Pl. IV.
5.	———— ambiguus	Pl. V.
6.	———— erythrorhynchus	Pl. VI.
7.	———— Inca	Pl. VII.
8.	———— Cuvieri	Pl. VIII.
9.	———— citreolaemus	Pl. IX.
10.	———— osculans	Pl. X.
11.	———— culminatus	Pl. XI.
12.	———— Ariel	Pl. XII.
13.	———— vitellinus	Pl. XIII.
14.	———— dicolorus	Pl. XIV.

For the Araçaris, Illiger's genus

PTEROGLOSSUS,

WITH THE FOLLOWING CHARACTERS :—

Rostrum, amplum, tenue, cultratum, basi margine incrassato ; maxillæ angulo frontali obtuso ; *tomia* serrata ; *nares* altiores et in maxillæ basi positæ ; *linguâ* mediocris, angusta, pennacea ; *alæ* concavæ, breviores, secundum

staturam, quam in genere *Ramphasto* dicto; primariis quartâ, quintâ et sextâ coequalibus et longissimis; cauda gradata; pedes scansorii; digiti externi internis longiores; acropodia scutulata.

Bill large, light, serrated on the edges; *nostrils* above situated in the base of the bill; *tongue* long, narrow and feather-like; *wings* shorter in proportion than in the genus *Ramphastos*; concave; fourth, fifth and sixth primaries equal, and the longest; *tail* graduated; *feet* scansorial; outer toes longer than the inner.

Although very generally dispersed over South America, the Araçaris have a less extended range than the true Toucans. I have not seen any species from the countries southward of the latitude of Rio de Janeiro, and no species have been found to the northward of Guatemala. The great countries of Venezuela, Guiana, the forests of the Amazon generally, and Northern Brazil are the portions of the Continent in which the species are found in the greatest abundance.

They are—

15.	Pteroglossus	Araçari	.	.	.	.	.	.	Pl. XV.
16.	————	Wiedi	.	.	.	.	.	.	Pl. XVI.
17.	————	pluricinctus	.	.	.	.	.	.	Pl. XVII.
18.	————	pæcilsternus	.	.	.	.	.	.	Pl. XVIII.
19.	————	castanotis	.	.	.	.	.	.	Pl. XIX.
20.	————	torquatus	.	.	.	.	.	.	Pl. XX.
21.	————	erythropygius	.	.	.	.	.	.	Pl. XXI.
22.	————	Humboldti	.	.	.	.	.	.	Pl. XXII.
23.	————	inscriptus	.	.	.	.	.	.	Pl. XXIII.
24.	————	viridis	.	.	.	.	.	.	Pl. XXIV.

Of these ten species seven are normal, and the remaining three somewhat aberrant; in fact the two lettered Araçaris, *P. Humboldti* and *P. inscriptus*, might with propriety be separated into a distinct genus, and the *P. viridis* made the type of another.

For the third section, or Banded Araçaris, I propose to adopt Prince Charles Lucien Bonaparte's generic title of

BEAUHARNAISIUS,

WITH THE FOLLOWING CHARACTERS :—

Aspectus generalis, sicut in genere *PTEROGLOSSO* dicto, attamen rostro delicatule læviore, necnon alis brevioribus, et caudâ attenuate minore.

General structure as in *Pteroglossus*, but the bill more delicate, the wings shorter, and the tail smaller and of a lighter form.

Unlike the members of the genus *Ramphastos*, which are universally spread over South America, and the *Pteroglossi*, which are nearly so, the members of the genus *Beauharnaisius* are almost entirely confined to the districts bordering the Amazon and its tributaries; and there is scarcely any part of the banks of this river where Palm-trees abound that one or other of the species is not to be found.

They are :—

25.	Beauharnaisius	ulocomus	.	.	.	.	.	Pl. XXV.
26.	—————	bitorquatus	.	.	.	.	.	Pl. XXVI.
27.	—————	Sturmi	.	.	.	.	.	Pl. XXVII.
28.	—————	Azaræ	.	.	.	.	.	Pl. XXVIII.
29.	—————	flavirostris	.	.	.	.	.	Pl. XXIX.
30.	—————	Mariæ	.	.	.	.	.	Pl. XXX.

This is by far the most beautiful section of the entire family.

In the plates and descriptive letter-press they are retained under the old term *Pteroglossus*; but in future they will stand as above-named.

The fourth section comprises the species constituting my genus

SELENIDERA,

WITH THE FOLLOWING CHARACTERS:—

Rostrum brevius et amplius quam in genere *Pteroglossus*; *cauda* ratione ad magnitudinem corporis habitâ brevior; sexus inter se colore dissimilis; mare caput pectusque nigra, fœminâ has partes castaneas habente; *plumæ auriculares* flavæ; *lunula* ad cervicem posticam flava.

Bill shorter and thicker than in the genus *Pteroglossus*; *tail* shorter in proportion to the size of the body; sexes differing in colour; the male having the head and breast black, the same parts in the female being chestnut; ear-coverts and a crescent at the back of the neck yellow.

This interesting group of Toucanets again have a more restricted range than either the typical *Ramphasti* or *Pteroglossi*. No one of them has yet been found so far to the northward as the Isthmus of Panama; and few of them have been observed beyond the latitude of the Amazon in this direction. On the banks of that river, however, and those of the Rio Negro and Rio Madeira, they are very numerously dispersed; and one species, the *Selenidera maculirostris*, is found as far south as Rio de Janeiro, and I believe in Corrientes and Paraguay; still the forests bordering the Upper Amazon and its tributaries are undoubtedly the cradle of the race. They constitute a well-marked section of the family, and are distinguished by their small size, by their short bills, by the crescentic mark of yellow at the base of the neck, and by the brilliant colours which adorn their ears and flanks. The females have all these characteristic marks, but differ conspicuously in the colouring of the anterior half of their bodies, which is generally chestnut-brown instead of black.

The species are—

31.	<i>Selenidera maculirostris</i>		Pl. XXXI.
32.	——— Gouldi		Pl. XXXII.
33.	——— Langsdorffi		Pl. XXXIII.
34.	——— Nattereri		Pl. XXXIV.
35.	——— Reinwardti		Pl. XXXV.
36.	——— piperivora		Pl. XXXVI.

The fifth section contains the Hill Toucans, forming my genus

ANDIGENA,

WITH THE FOLLOWING CHARACTERS:—

Rostrum turgidum, magnum, attamen minus quam in genere restricto *Pteroglossus* dicto. *Alæ* et *caudæ* ut in genere *Aulacorampho* nominato. *Ptilum* elongatum, laxum, capillaceum.

Bill stout and swollen, but not so large as in the true *Pteroglossi*; *wings* and *tail* very similar to those of *Aulacoramphus*; *general plumage* long, loose, and hair-like.

It has been found that even the higher ranges of the Andes are not untenanted by the Toucans; Professor Jameson of Quito informs me that the *A. laminirostris* even ascends the sides of Pichincha to an elevation of from six to ten thousand feet. The members of this genus extend all along the Andes and the Cordilleras, from the Caraccas to Bolivia, where Mr. Bridges found a species in the forests of Cocapata, in the department of Cochabamba; one species, however, the *A. Bailloni*, appears never to quit the lowlands of Brazil. These Hill Toucans have stout hard bills, are very thickly clothed, and have the under surface generally of a uniform and delicate colour.

The species are—

37. <i>Andigena laminirostris</i>		Pl. XXXVII.
38. ——— <i>hypoglaucus</i>		Pl. XXXVIII.
39. ——— <i>nigrirostris</i>		Pl. XXXIX.
40. ——— <i>cucullatus</i>		Pl. XL.
41. ——— <i>Bailloni</i>		Pl. XLI.

The sixth and last section comprises a series of birds remarkable for some of the species having the sides of their bills deeply grooved; they form my genus

AULACORAMPHUS,

WITH THE FOLLOWING CHARACTERS:—

Rostrum, comparative breve, latum, ad culmen depressum; apud latera sulcatum; mandibulâ inferiore ad basin oblique ultra oculi lineam tendente; *alæ* breves et rotundatæ, remige quartâ longissimâ, quintâ, sextâ, et

septimâ inter se fere cœqualibus; *cauda*, paululum brevis, et minus gradata quam in genere *Pterogloss* nominato.

Bill comparatively short, broad and flattened on the culmen; furrowed on the sides, and with the base of the under mandible extending obliquely beyond the line of the eye; *wings* short and round, the fourth quill the longest, the fifth, sixth and seventh being nearly of equal length; *tail* comparatively short, and not so decidedly graduated as in the true *Pteroglossi*.

This may be considered an Andean group, for it is among those lofty mountain ranges that nearly all the species are found. They are dispersed over all parts of the temperate regions, from Bolivia on the south to Mexico on the north. They possess characters common to each other; their plumage is nearly of a uniform green, and the sexes are precisely alike in colour.

The species are—

42.	<i>Aulacoramphus sulcatus</i>		Pl. XLII.
43.	————— <i>Derbianus</i>		Pl. XLIII.
44.	————— <i>castaneorhynchus</i>		Pl. XLIV.
45.	————— <i>hæmatopygius</i>		Pl. XLV.
46.	————— <i>cæruleocinctus</i>		Pl. XLVI.
47.	————— <i>prasinus</i>		Pl. XLVII.
48.	————— <i>Wagleri</i>		Pl. XLVIII.
49.	————— <i>albivitta</i>		Pl. XLIX.
50.	————— <i>atrocularis</i>		Pl. L.
51.	————— <i>cæruleocularis</i>		Pl. LI.

Since the above was in type, Prince Charles Lucien Bonaparte has sent me a portion of his remarks on the Birds brought by the late M. De Lattre from Nicaragua, in which I find in a note at page 84 he proposes a still further division of this family: first, *RAMPHOMELUS* for the *Andigena nigrirostris*; next, *RAMPHOXANTHUS* for the *Aulacoramphus prasinus*, *A. albivitta*, &c.; and *PIPERIVORUS* for *Selenidera piperivora*, *Pteroglossus viridis*, *Andigena Bailloni*, *Pteroglossus inscriptus*, &c.

As regards *RAMPHOMELUS*, I think any further subdivision of the Hill Toucans inadmissible: the bird upon which the Prince proposes to establish the genus has all the characters common to the other members of the section, with the exception of the black colouring of the beak, which surely must be regarded rather as a specific than as a generic distinction.

Precisely the same remark may be made with respect to his new genus *RAMPHONANTHUS* for *Aulacoramphus prasinus* and *A. albivitta*, inasmuch as they do not in my opinion offer sufficient generic differences to warrant their separation from the other birds with which I have associated them.

The birds comprising his genus *PIPERIVORUS* I consider to belong to three distinct genera. The first—*pipericora*—is a true *Selenidera*—the fourth, *Bailloni*—an *Andigena*; the second and third—*viridis* and *inscriptus*—might perhaps be separated; but in that case *viridis* would stand alone in one genus and *inscriptus* with *Humboldti* in another, for which the term *GRAMMARHYNCHUS* might be an appropriate appellation.

Gould, John. 1852. "Introduction [A monograph of the Ramphastidae, or family of toucans]." *A monograph of the Ramphastidae, or family of toucans* –. <https://doi.org/10.5962/p.322921>.

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