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PTEROGLOSSUS BEAUHARNAISI, *Wagl.*

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A MONOGRAPH

OF

THE RAMPHASTIDÆ,

OR

FAMILY OF TOUCANS.

BY

JOHN GOULD, F.R.S.,

F.L.S., F.Z.S., M.E.S., F.C.P.S.M., F.R.A.S.N.A., &c. &c. &c.

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JOHN GOULD, F.R.S.,

F.L.S., F.Z.S., M.E.S., F.ETHN.S., F.R.GEOG.S., M.RAY S., CORR. MEMB. OF THE ROYAL ACADEMY OF SCIENCES OF TURIN; OF THE SOC. OF THE MUSEUM OF NAT. HIST. OF STRASBOURG; FOR. MEMB. OF THE NAT. HIST. SOC. OF NÜRNBERG, AND OF THE IMP. NAT. HIST. SOC. OF MOSCOW; HON. MEMB. OF THE NAT. HIST. SOC. OF DARMSTADT; OF THE NAT. HIST. AND THE NAT. HIST. AND MED. SOCS. OF DRESDEN; OF THE TASMANIAN SOC. OF VAN DIEMEN'S LAND; OF THE ROY. ZOOL. SOC. OF IRELAND; OF THE PENZANCE NAT. HIST. SOC.; OF THE WORCESTER NAT. HIST. SOC.; OF THE NORTHUMBERLAND, DURHAM AND NEWCASTLE NAT. HIST. SOC.; OF THE IPSWICH MUSEUM; OF THE ORN. SOC. OF GERMANY, ETC.

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1854.

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TO

PROFESSOR TEMMINCK,

OF LEYDEN,

THE PRESENT AS WELL AS THE FORMER EDITION OF THIS

MONOGRAPH OF THE RAMPHASTIDÆ

Is Dedicated,

AS A TRIBUTE DUE TO HIS LABOURS

IN THE PROMOTION OF NATURAL SCIENCE, AND AS A PROOF OF SINCERE ESTEEM

AFTER A CORDIAL INTERCOURSE OF MANY YEARS,

BY HIS SINCERE FRIEND

JOHN GOULD.

WILLIAM WEILER,
Bookseller & Bookbinder,
38 Bishop Street, Dublin.

PREFACE.

IN the Preface to the First Edition of this Work I remarked that I was induced to publish it in order to make known several new species of a most remarkable group of birds, and to revise and set forth in as clear a light as possible the numerous members of which the family is composed; if these reasons were sufficient to induce me then to attempt their elucidation, the same reasons become still more urgent now, when after an interval of twenty years a great amount of information respecting the entire group, and a further addition of new species has been obtained, rendering a SECOND EDITION a matter of necessity. It appeared to me, as I formerly remarked, that the members of the group were naturally divided into several more genera than the two—*Ramphastos* and *Pteroglossus*—then recognised; nor did I omit to notice a suggestion, that some distinguishing title should be given to these divisions, but I did not then feel warranted in following out this idea; the materials since acquired have, however, thrown much additional light on the subject, and I now feel myself justified in proposing the requisite generic appellations, which with their appropriate characters will be found in their proper place in the Introduction.

In order to render the Work as perfect as possible, I have obtained access to all the collections of this country, and have also visited and examined the principal Museums of the continent; in several of which I found some species not contained in the others. Thus in Vienna I first saw the *Pteroglossus pluricinctus*; in Munich *Selenidera Reinwardti*, *S. Langsdorffi* and *Aulacoramphus Wagleri*; in Paris *Pteroglossus flavirostris*; while Berlin and Leyden both contained other species not previously known to me. In many instances single specimens only existed, appertaining moreover to *Ramphastidæ*, in which much dissimilarity occurs in the colouring of the sexes, whereby I was prevented from illustrating those species so fully as I could have wished. Just as my Monograph was brought to a close, that celebrated traveller and naturalist, the late Mr. John Natterer of Vienna, returned to Europe, bringing with him females of the species of which I found males only at Munich, together with several other new ones acquired during a sojourn of eighteen years in the Brazils; unfortunately, however, he did not arrive in London until the last sheets had gone to press, consequently I was unable to

include therein figures of these new species, as well as the many valuable notes which he, in the kindest manner, placed at my disposal. I felt very much disposed to publish the work anew, or at least to issue a supplement containing these novelties, but from one cause or other I have delayed so doing until the present moment. In the interim I have constantly kept the subject in view, and have obtained much interesting information respecting the older species, besides the acceptable addition from time to time of others new to science.

I now publish a Second Edition with new drawings of the old species, and figures and descriptions of no less than eighteen others—all, in fact, that are known up to the present time. Great attention has been paid to the colouring of the soft parts—the orbits, eyes, bill, legs, &c. —the hues of which are so evanescent, that unless they be either drawn or noted down from the living bird or immediately after death, it is impossible to present faithful portraitures; and here I have derived much valuable information from the rich menagerie of the Zoological Society of London, in which living examples of no less than five species were exhibited during the year 1853.

Of late years, the lowlands of the great country of South America, and particularly those bordering the mighty Amazon and its tributaries, have been explored by many intelligent travellers, who have diligently searched for novelties with success. It is, however, from the high mountain ranges of the Andes and the Cordilleras, rather than from the low forest-covered lands, that the greater number of the recent accessions to the *Ramphastidæ* has emanated, and it is there that all the species (with a single exception) of the genus *Andigena* have been discovered.

For the elaborate "Observations on the Anatomy of the Toucan," given at the close, I am indebted to my friend Professor Owen, F.R.S.: they were the result of investigations instituted by himself expressly for my Monograph.

In conclusion, I beg to state, that neither pains nor expense have been spared to render the present edition as perfect as possible up to the present period. It will be found to comprise illustrations and descriptions of 51 species. The greater portion of the originals from which my figures have been taken are now in the British Museum, and these, in addition to the species previously contained therein, contribute to render the series of the *Ramphastidæ* in the National Collection by far the finest and most complete in Europe.

May 1st, 1854.

JOHN GOULD.

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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. pavoninus*, *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 *Aulacoramphus 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 *Humboldti*. 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*.

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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.
——— osculans.
——— culminatus.
Pteroglossus pluricinctus.
——— pœcilosternus.
——— castanotis.
——— erythropygius.

Pteroglossus Mariæ.
Andigena laminirostris.
——— hypoglaucus.
——— cucullatus.
Selenidera Nattereri.
Aulacoramphus 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 Araçaris, 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-

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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.

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"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 disjointing. But in order not to deviate in any respect from the truth, I confess that I 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,

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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.

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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 *Seleniderœ*; 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; *orbitæ* nudæ; *lingua* mediocris, angusta, pennacea; *alæ* subelongatæ, concavæ; remigibus primis et secundariis ad apices in spatham angustam eductis; primariis sextâ et septimâ coæqualibus, 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.	——— citreolæmus	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; *lingua* mediocris, angusta, pennacea; *alæ* concavæ, breviores, secundum

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staturam, quam in genere *Ramphasto* dicto; primariis quartâ, quintâ et sextâ coæqualibus 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.	——— pœcilosternus	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.

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The fourth section comprises the species constituting my genus

SELENIDERA,

WITH THE FOLLOWING CHARACTERS :—

Rostrum brevius et amplius quam in genere *Pteroglosso*; *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. Selenidera maculirostris . . . . . 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. *Ptiluma* 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.	Andigena laminirostris	Pl. XXXVII.
38.	——— hypoglaucus	Pl. XXXVIII.
39.	——— nigrirostris	Pl. XXXIX.
40.	——— cucullatus	Pl. XL.
41.	——— Bailloni	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

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septimâ inter se fere coæqualibus; *cauda*, paululum brevis, et minus gradata quam in genere *Pteroglosso* 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.	Aulacoramphus sulcatus	Pl. XLII.
43.	——— Derbianus	Pl. XLIII.
44.	——— castaneorhynchus	Pl. XLIV.
45.	——— hæmatopygius	Pl. XLV.
46.	——— cæruleocinctus	Pl. XLVI.
47.	——— prasinus	Pl. XLVII.
48.	——— Wagleri	Pl. XLVIII.
49.	——— albivitta	Pl. XLIX.
50.	——— atrogularis	Pl. L.
51.	——— cæruleogularis	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 RAMPHOXANTHUS 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 —*piperivora*—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.

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LIST OF PLATES.

Ramphastos Toco, *Gmel.*
——— carinatus, *Swains.*
——— brevicarinatus, *Gould.*
——— Tocard, *Vieill.*
——— ambiguus, *Swains.*
——— erythrorhynchus, *Gmel.*
——— Inca, *Gould.*
——— Cuvieri, *Wagl.*
——— citreolæmus, *Gould.*
——— osculans, *Gould.*
——— culminatus, *Gould.*
——— Ariel, *Vig.*
——— vitellinus, *Ill.*
——— dicolorus, *Gmel.*
Pteroglossus Aracari.
——— Wiedi, *Sturm.*
——— pluricinctus, *Gould.*
——— pœcilosternus, *Gould.*
——— castanotis, *Gould.*
——— torquatus, *Wagl.*
——— erythropygius, *Gould.*
——— Humboldti, *Wagl.*
——— inscriptus, *Swains.*
——— viridis.
——— Beauharnaisi, *Wagl.*
——— bitorquatus, *Vig.*
Pteroglossus Sturmi, *Natt.*
——— Azaræ, *Vieill.*
——— flavirostris, *Fras.*
——— Mariæ, *Gould.*
Selenidera maculirostris.
——— Gouldi.
——— Langsdorffi.
——— Nattereri, *Gould.*
——— Reinwardti.
——— piperivora.
Andigena laminirostris, *Gould.*
——— hypoglaucus, *Gould.*
——— cucullatus, *Gould.*
——— nigrirostris.
——— Bailloni.
Aulacoramphus sulcatus.
——— Derbianus, *Gould.*
——— castaneorhynchus, *Gould.*
——— hæmatopygius, *Gould.*
——— cæruleicinctus.
——— prasinus.
——— Wagleri, *Sturm.*
——— albivitta.
——— atrogularis.
——— cæruleogularis, *Gould.*

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RAMPHASTOS TOCO, *Linn.*

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E

RAMPHASTOS TOCO, *Gmel.*

Toco Toucan.

Specific Character.

Ramph. rostro magno, aurantiaco; fasciâ basali maculâque ovali utrinque ad apicem mandibulæ superioris nigris; tectricibus caudæ superioribus albis.

General plumage black; throat and cheeks white, gradually passing into brimstone-yellow on the breast, the lower feathers of which are narrowly fringed with blood-red; upper tail-coverts white; under tail-coverts blood-red; bill rich orange, with a series of obscure transverse marks of a deeper hue on the sides; a large oval spot of black on each side of the tip of the upper, and a transverse band of the same hue at the base of both mandibles; irides pale green next the pupil, to which succeeds a narrow ring of yellow, bounded externally by a still narrower one of olive; orbits naked, prominent, much corrugated, and of two colours; the part next the eye being fine cobalt-blue, forming a ring nearly a quarter of an inch in breadth, and the remainder very rich orange; legs and feet greenish blue; claws black.

Total length, 24 inches; *bill*, 8½; *wing*, 10; *tail*, 7; *tarsi*, 2.

Ramphastos Toco, Gmel. Edit. Linn. Syst. Nat., tom. i. p. 356.—Lath. Ind. Orn., vol. i. p. 135.—Temm. Man. d'Orn., 2nde Edit. tom. i. p. lxxvi.—Wagl. Syst. Av., *Ramphastos*, sp. 1.—Gould's Mon. of Ramph., pl. 6.—Ib. Sturm's Edit., pl. .—Gray and Mitch. Gen. of Birds, vol. ii. p. 403, *Ramphastos*, sp. 7.—Bonap. Consp. Gen. Av., p. 93, *Ramphastos*, sp. 10.

Toucan, seu Pica Bresselica, Gesn. Av., p. 726.

Le Toucan de Cayenne, appellé Toco, Buff. Pl. Enl. 82.

Le Toco, Buff. Hist. Nat. des Ois., tom. vii. p. 117. pl. 6.—Le Vaill. Ois. de Parad., tom. ii. p. 7. pl. 2.

Le Toucan proprement dit, Azara, Voy. dans L'Amér. Mérid., tom. iii. p. 141. No. L.

The Toco, Lath. Gen. Syn., tom. i. p. 325. pl. 9.

Toco Toucan, Shaw, Gen. Zool., vol. viii. p. 361. pl. 46.—Lath. Gen. Hist., vol. ii. p. 281. pl. xxix.

Ramphastos Indicus, Mill. Cim. Phys., pl. 57?

——— *niveus*, Less. Compl. Buff., p. 184?

——— *magnirostris*, Swains.

Although other members of the family equal the present species in the size of the body and the relative proportions of the wings and tail, none of them have so large or so gaily-coloured a bill; in this respect it far exceeds all other known species, and is rendered not only one of the most striking and singular members of the group to which it belongs, but one of the most *outré* birds yet discovered. Yet, when we view the bird in a state of nature or in our menageries, we see this organ carried with the greatest ease, the lightness of its structure enabling the bird to feed, and to plume its body feathers with as much facility as other birds do with their shorter and apparently more manageable bills. Several examples lived for some years in the fine Menagerie of the late Earl of Derby, and latterly the cages in the Gardens of the Zoological Society in the Regent's Park have been graced and enlivened by the presence of the *Ramphastos Toco*. But

I must here speak of this fine species in a state of nature, and the extent of its range over the great continent of South America. Examples are frequently sent from Cayenne both to this country and to France, but I have never seen specimens from any locality farther to the north; the great delta of the Amazon, that is, the forests which clothe the sides of that river and the islands near to its mouth, are the situations in which it is most numerous; but even here it would seem that it is not universally spread, since Mr. Wallace informs me that it is not seen in the immediate neighbourhood of Para, while it is common in the islands on the Guiana side of the river. Mr. Wallace also found it higher up the Amazon, as well as in the same districts on the River Madeira that are inhabited by the *Pteroglossus Beauharnaisi* or *Curl-crested Araçari*, and states that he usually observed it in small groups, three or four in number, and that its vicinity was always indicated by its loud croaking notes. Following up the River Madeira, the tributaries of which commence in the Andes, I may state that I have myself seen skins from the borders of these streams in Bolivia, and it is spoken of by Azara as an inhabitant of Paraguay.

It is from the pens of His Highness the Prince Maximilian of Wied, and the late M. John Natterer, that we derive the greatest amount of information respecting this species. Both these naturalists observed it in Brazil, which may be considered its central habitat.

"This species," says Prince Maximilian, "is never found near the coast, but is plentiful in the interior of the province of Minas Geraes and Bahia; that it is also abundant in the southern part of Brazil is proved by Mr. Sellow having found it in considerable numbers in latitude 32° S. Those observed in the vicinity of Bahia were very shy, the result of their having been repeatedly fired at by the inhabitants in defence of their fruit-trees, and to procure them for food; notwithstanding which, the desire to feed upon the oranges and guavas induced them to approach very near the town at the season when those fruits were ripening.

"Very pretty little powder-flasks are occasionally made of their large and finely coloured bills."

M. Natterer, who first met with it in the province of St. Paul's and afterwards on the road to Goyaz and Mattogrosso, on the banks of the Amazon and on the Upper Rio Branco, remarks that it will probably be found in all parts of Brazil, and believes that the bird prefers woods adjoining sandy plains, for he more than once met with it in low steppe-coppices, where ripe fruits were to be found. He generally met with it in small families, and observed that the bill varied in length according to the age or sex of the bird, and that the note was deeper than that of all the other members of the family. It resembles *grrr* or *grrra*.

I find the following note with regard to the nidification of this species in Edwards's entertaining "Voyage up the Amazon"—"The nests of 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." The only observation I have to make on this passage is, that it is desirable that the nidification of the bird should be detailed by other observers before full reliance be placed upon the assertion that the bird makes a nest, for the hollows of decayed trees are the usual incubating places of all the Toucans.

As is the case with all the Toucans, the sexes, although assimilating in their colouring and markings, differ very considerably in size and in the relative admeasurements of the bill, the female being always nearly a third smaller than the male; the young birds assume the colouring of the adult at a very early age, but have a soft, almost pulpy bill, in which the fine colouring and the denticulations are merely indicated.

The Plate represents a male and a female of the natural size.

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RAMPHASTOS CARINATUS, *Swains.*

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RAMPHASTOS CARINATUS, *Swains.*

Keel-billed Toucan.

Specific Character.

Ramph. rostro compresso, fasciâ angustâ nigrâ basali circumdatâ, apice sanguineo; mandibulâ superiore viridi, culmine maculâque utrinque aurantio-flavis; gutture pectoreque luteis; uropygio albo.

Crown of the head and back of the neck dull black, with a wash of rufous on the latter, varying in intensity in different individuals; back, wings, abdomen and tail black, glossed with green; upper tail-coverts white; under tail-coverts vivid blood-red; cheeks and throat yellow, bounded below with a band of scarlet in some specimens and not in others; bill green, with a spot of orange-yellow on each side of the upper mandible, and a line of the same colour extending along the culmen throughout its whole length; both mandibles bounded at the base with a narrow line of black and tipped with red, and both marked with indistinct transverse rays of black; orbits verditer-green, passing into yellow on their outer margin; immediately behind the bill a small patch of yellow feathers; feet blue, with a tinge of lilac on their under surface.

Total length, 22 inches; *bill*, $5\frac{3}{4}$; *wing*, $8\frac{3}{4}$; *tail*, 7; *tarsi*, $2\frac{3}{4}$.

Toucan, or Brazilian Pie, Edw. Glean., vol. ii. p. 64. pl. 64.
Yellow-breasted Toucan, Ib., vol. iii. p. 253. pl. 329.
Ramphastos Tucanus, Shaw, Gen. Hist., vol. viii. p. 362.
——— *callorhinchus*, Wagl. Syst. Av., *Ramphastos*, sp. 6.
——— *pœcilorhynchus*, Licht. in Mus. Berlin.
——— *sulfuratus*, Less. Traité d'Orn., p. 173.
——— *carinatus*, Swains. Zool. Ill., vol. i. pl. 45.—Wagl. Syst. Av., *Ramphastos*, sp. 7.—Gould, Mon. of Ramph., pl. 7.—Ib. Sturm's Edit., pl.
——— *piscivorus*, Linn. Syst. Nat., tom. i. p. 151.—Gmel. Edit., tom. i. p. 355.—Lath. Ind. Orn., tom. i. p. 136.—Gray and Mitch. Gen. of Birds, vol. ii. p. 403, *Ramphastos*, sp. 6.—Bonap. Consp. Gen. Av., p. 93, *Ramphastos*, sp. 9.
Tucana Brasiliensis gutture albo, Briss. Orn., tom. iv. p. 413.—Ib. 8vo, tom ii. p. 158.
Brazilian Toucan, Lath. Gen. Syn., tom. i. p. 327.—Shaw, Nat. Misc., pl. 183.—Ib. Gen. Zool., vol. viii. p. 363.—Lath. Gen. Hist., vol. ii. p. 284.

There is little doubt in my mind that the characters of Linnæus' *Ramphastos piscivorus* were taken from an example of this species; it is true that the throat is described as white, which would militate against such an opinion; but it is probable that the whiteness of the throat was due to the bird being out of health or to some other cause: if this supposition be correct, it will be said that the term *piscivorus* ought to be the specific appellation adopted; it is, however, so objectionable, being indicative of a habit not found to exist in any species of the family, that I have preferred employing Mr. Swainson's name, *carinatus*, so peculiarly descriptive of the remarkable form of the bill. I do not know any species of the family which is subject

to greater variety in the colouring of the bill than the present bird; some individuals having the lower mandible blue and the upper green, while in others both mandibles are of the latter colour; in some the orange spot on the sides of the bill is almost wanting; in others it is divided into a succession of small ones, or dilated into a broad band occupying nearly the whole length of the mandible; in others again the yellow culmenal mark is absent: an individual with this colouring of the bill, correctly represented in the accompanying Plate, lived during part of the years 1849 and 1850 in the Gardens of the Zoological Society. A great difference is also observable in the length of the bills of specimens from different localities, some being at least two inches shorter than others, while the depth is the same. In some examples a well-defined band of scarlet occurs on the breast, separating the yellow of the throat from the black of the abdomen, while in others this band is entirely wanting.

The native country of this bird may be said to be Mexico, over the greater portion of which, from the latitude of Vera Cruz to the Isthmus of Panama, it is I believe very generally dispersed.

In the British Museum there are several specimens with very short bills; these were brought from the Pacific side of the country; and if it should be found that none of the longer-billed birds dwell there, that circumstance would tend to confirm the opinion I have long entertained, that there is probably more than one species of green-billed Toucan.

Two examples of this bird, formerly in the possession of Prince Massena at Paris, and now in that of T. B. Wilson, Esq., of Philadelphia, present the following difference:—the longer-billed specimen has no trace of the scarlet pectoral band, while in the shorter one it is well-defined; an additional reason for believing that they constitute two species.

The bird is called *Pito canoa* by the inhabitants of Mexico.

The Plate represents the birds of the natural size, with the colouring of the bill and denuded parts taken from life.

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RAMPHASTOS BREVICARINATUS, *Gould*

WILLIAM WESLE
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RAMPHASTOS BREVICARINATUS, *Gould.*

Short-billed Toucan.

Specific Character.

Ramph. rostro brevi, compresso, fasciâ, angustâ nigrâ basali circumdato, apice sanguineo; mandibulâ superiore viridi, culmine maculâque utrinque aurantio-flavis; gutture pectoreque luteis, hoc torque sanguineo infra succincto.

General plumage black with a pale wash of rufous at the back of the neck, and a gloss of green on the back, wings, abdomen and tail; upper tail-coverts white; under tail-coverts blood-red; cheeks, throat and breast yellow, bounded below with a band of scarlet; bill light green, passing into deep red on the tips of both mandibles; along each side of the upper mandible an oblong patch of reddish orange; both mandibles bounded at the base with a narrow line of black, and both marked near the tomiæ with indistinct transverse rays of black; orbits verditer-green, passing into yellow on their outer margin; feet blue, tinged with lilac on their under surface.

Total length, 14 inches; *bill*, $4\frac{1}{8}$; *wing*, 7; *tail*, 6; *tarsi*, $1\frac{5}{8}$.

From the time I commenced the study of the various members of this group of birds, I have always felt convinced that the Mexican Keel-billed Toucans constituted more than a single species; for upon examining the fine collection of the Prince Massena at Paris, while engaged on the first edition of this work, I found two fully adult specimens differing considerably in all their admeasurements, and especially in the length of the bill, which in one was fully a third longer than that of the other, while there was no marked difference in their depth; in the smaller bird the yellow of the breast was separated from the black of the under surface by a well-defined and somewhat broad band of blood-red, of which there was either a very slight or no trace in the larger one; subsequently I saw other examples in some of the continental museums, but was undecided as to the propriety of characterizing them as distinct; the British Museum, however, having been lately enriched with specimens of the short-billed species sent direct from the western side of the isthmus of Panama, all of which are alike in admeasurement, and have well-defined pectoral scarlet bands, I have considered it only right to define and give a representation of the short-billed bird, leaving it for future explorers to determine whether it be really distinct or only a local variety. Its specific characters are a short and deep bill, whence the name *brevicarinatus*, accompanied by a bright scarlet band on the chest. My attention has been lately called to a third variety or species, intermediate between the two, but from a different locality—New Grenada; the first instance that has come under my notice of a Keel-billed Toucan being found south of the Isthmus of Panama.

The collection of the Prince Massena above alluded to is now in the Museum at Philadelphia; the American ornithologists will therefore have an opportunity of investigating the subject, and of giving an opinion as to the specific value of *Ramphastos brevicarinatus*.

The figures are of the natural size.

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RAMPHASTOS TOCARD, *Vieill.*

WILLIAM WESLE
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RAMPHASTOS TOCARD, *Vieill.*

Tocard Toucan.

Specific Character.

Ramph. mandibulæ superioris basi infernè inferiorisque basi totâ castaneo-rufis; hujus apice lineâque obliquâ a rictu ad frontem extensâ nigris; superioris culmine parteque anticâ aurantiacis; gutture lutescenti-flavo; tectricibus caudæ superioribus albis.

General plumage black; throat rich yellow, bounded below by a narrow line of white, to which succeeds a broader one of scarlet; upper tail-coverts white; under tail-coverts blood-red; basal half of the sides of both mandibles reddish chestnut, passing into black anteriorly on the upper mandible, and into the black apical half of the lower mandible; the remainder of the upper mandible rich orange-yellow, the extent of the two colours being strongly defined; orbits and naked skin of the throat beautiful yellow; irides blackish brown; tarsi and feet blue.

Total length, 23 inches; *bill*, 6½; *wing*, 9¼; *tail*, 7; *tarsi*, 2.

Le Tocard, Levaill. Hist. Nat. des Ois. de Parad., tom. ii. p. 25. pl. 9.

Ramphastos Tocard, Vieill. Nouv. Dict. d'Hist. Nat., 2nde Edit., tom. 34. p. 280.—Ib. Ency. Méth. Orn., part iii. p. 1430.—Wagl. Syst. Av., *Ramphastos*, sp. 4.—Less. Traité d'Orn., p. 171, *Ramphastos*, sp. 4.—Gray and Mitch. Gen. of Birds, vol. ii. p. 403, *Ramphastos*, sp. 5.—Bonap. Consp. Gen. Av., p. 93, *Ramphastos*, sp. 8.

——— *ambiguus*, Swains. Zool. Ill., vol. iii. pl. 168.

——— *Swainsonii*, Gould in Proc. of Zool. Soc., Part I. p. 69.—Ib. Mon. of Ramph., pl. 8.—Ib. Sturm's Edit.

——— *eugnathos*, Wagl.

In the former edition of this work I dedicated this species to Mr. Swainson the ornithologist, under the belief that as so much confusion existed with respect to the bird figured by Levaillant under the name of *Le Tocard*, I should be better promoting the cause of science by giving it a new name, than in retaining one which it was very doubtful if it belonged to it. I find, however, that modern writers are generally disposed to prefer the term *Tocard* applied to it by M. Vieillot, and as it is far from my wish to dissent from the general opinion without very good grounds for so doing, I have adopted it in the present edition. I may add, that I was mainly induced to give a distinctive appellation by the circumstance of Levaillant's figure representing the bird with a white breast; but I have now every reason for believing that this was due to his having drawn from a faded specimen.

The native habitat of this species is the hotter and temperate regions of Peru, Ecuador and Columbia. I have myself received it from Bogota, Popayan and Quito; and there are magnificent specimens in the British Museum, which I believe were collected at Buena Ventura. We find that it was one of the species which excited the attention of Dr. Tschudi during his travels in Peru; he informs us that it extends farther to the eastward than any other species observed by him, and that it is found in the hottest parts of the country; that it shrouds itself in solitude amidst the dense foliage of the gigantic trees during the day, and only comes out at sunset. Its monotonous cry closely resembles the Spanish words "*Dioste dé*" (May God give thee); hence the Indians call it *Dioste dé*, and maintain that while emitting its cry it cannot be shot; but the contrary is the case, for its attention being entirely absorbed in its occupation, it takes no heed of the hunter, and may be easily procured. Dr. Tschudi also states, that a living specimen kept by him for some time while at Lima lived very peaceably with the fowls, and took its food with them; and that it was his intention to have brought it with him to Europe, but unluckily it fell into a water-tank kept for ducks, and was drowned.

I have been favoured by M. Jules Bourcier, late French Consul at Quito, with a fine head and neck of a specimen which he procured living, and which unfortunately died on his passage to Europe: this relic, together with the information M. Bourcier gave me, has enabled me to figure the soft parts correctly. But neither M. Bourcier nor Dr. Tschudi has told us whether the difference observable in the colouring of the bill is due to sex or to immaturity. This therefore is a point yet to be determined by those who may be favourably situated for investigating it.

The *Ramphastos Tocard* must be regarded as one of the largest and noblest members of the family, and one which would be a most attractive and ornamental object for our aviaries, could it be introduced with success; a matter in my opinion of but little difficulty.

The figures are of the natural size.

WILLIAM WALLER
Bookbinder & Bibl
St. James Street,

RAMPHASTOS AMBIGUUS, *Swains.*

Gould & Richter del. et lith.
Hullmandel & Walton, Imp.

RAMPHASTOS AMBIGUUS, *Swains.*

Doubtful Toucan.

Specific Character.

"*Ramph. niger; jugulo flavo; mandibulæ superioris parte superiore flavâ, transversè maculatâ, strigâ viridi obliquè divisâ; mandibulâ inferiore nigrâ.*"—Swainson.

General plumage black, with a tinge of rufous at the back of the neck and a greenish gloss on the wings, body and tail; throat rich yellow, bounded below by a narrow line of yellowish white, to which succeeds a broader one of blood-red; upper tail-coverts creamy white; under tail-coverts blood-red; upper mandible obliquely divided for about three-fourths of its length from the base by a strongly defined streak of black, the space below which is chocolate-black, and that above yellow, traversed by a broad streak of green; under mandible chocolate-black at the base, passing into black towards the tip; orbits blue?; legs and feet blue above, lilac beneath.

Total length, 20 inches; *bill*, $5\frac{1}{4}$; *wing*, $8\frac{3}{4}$; *tail*, $6\frac{1}{2}$; *tarsi*, $1\frac{7}{8}$.

Ramphastos ambiguus, Swains. Zool. Ill. 1st Ser., vol. iii. pl. 168.
——— *Swainsonii*, Gould, Mon. of Ramph., pl. 8, lower figure.—Ib. Sturm's Edit., pl. , lower figure.

However much I may have been perplexed by the Mexican Keel-billed Toucans, I have been ten times more so by the Columbian species known under the name of *Tocard*, to which in the former edition of this work I gave the name of *Swainsoni*, believing as I did that the *Tocard* of Le Vaillant and the *Ramphastos ambiguus* of Swainson were one and the same species; I am now, however, induced to regard them as distinct, in consequence of having recently seen in some of the continental Museums, and lately received in a collection of birds from the neighbourhood of Bogota, several examples which precisely accord with Swainson's figure of his *Ramphastos ambiguus*, and which differ from the *R. Tocard* in having smaller and straighter bills, with all the space beneath the oblique band purplish black, and with a distinct trace of the green mark along the sides of the yellow portion of the upper mandible so conspicuous in Swainson's drawing; I have determined therefore upon restoring that appellation to the bird for which Mr. Swainson doubtless intended it, and which I believe to be quite distinct from the *R. Tocard*. Some variation appears to exist in the colouring of the bare skin round the eye. Mr. Mark, Her Majesty's Consul at Bogota, tells me it is bluish green. Dr. Tschudi, who collected specimens in Peru, says it is blue, which on examination I found to be the case, so far as could be judged from the appearance of his specimen in the Museum at Neufchatel. Swainson, who states that his figure was taken from a drawing made from the bird immediately after death, also represents it blue: the diversity of hue is probably due to age, but may be attributable to some other circumstance with which we are not acquainted. In the examples from Bogota, the oblique verditer-green mark on the upper mandible, forming so conspicuous a feature in Swainson's figure, is very apparent; and this among other reasons has led me to consider the species to be a true one and to figure it as such.

It is scarcely necessary to add, that this conclusion has been arrived at since my account of the *R. Tocard* was printed; and that the insertion of Swainson's name of *R. ambiguus* among the synonyms of that species is an error.

The term "*Doubtful*," I may observe, alludes to the species, and not to the "*Toucan*" as a generic appellation.

The figures are of the natural size.

RAMPHASTOS ERYTHRORHYNCHOS, *Gmel.*

Gould & Richter lith.
Hullmandel & Walton

RAMPHASTOS ERYTHRORHYNCHUS, *Gmel.*

Red-billed Toucan.

Specific Character.

Ramph. rostro rubro; culmine luteo; genis, gutture, pectoreque, albis lutescenti-tinctis; tectricibus caudæ superioribus flavis.

Crown of the head, back, wings, abdomen and tail black; throat and breast white, with a faint wash of straw-colour pervading the latter, and bounded below by a crescent of fine deep scarlet; upper tail-coverts sulphur-yellow; under tail-coverts deep scarlet; bill rich crimson-red on the sides, bounded posteriorly by a transverse band, which as well as the edges of both mandibles and the point of the lower is deep black; culmen yellow, becoming of a pale horn-colour at the tip; across the base of the bill a broad band, which on the upper mandible is yellow, and on the under rich bluish lead-colour, the two colours blending into each other at the edges of the mandibles; immediately at the base of the bill a strong line of black; orbits greenish blue, with a ring of bluish lilac around the eye; irides dark brown; naked skin of the throat bluish green; above the orbits at the base of the upper mandible a small patch of white feathers; feet blue, with a lilac tinge on their under surface; nails black.

Total length, 22 inches; *bill*, 6¼; *wing*, 9; *tail*, 6½; *tarsi*, 2.

Female.—Similar to the male in colour, but somewhat smaller in size.

Toucan Surinamensis niger ex albo, flavo, et rubro mixtus, Petiv. Gazoph., t. 44. fig. 13.
Red-beaked Toucan, Edw. Glean. Nat. Hist., p. 58. pl. 238.—Lath. Gen. Syn., vol. i. p. 328.
Ramphastos Tucanus, Linn. Syst. Nat. Edit. 10.—Borowski, Natur., tom. ii. p. 97. t. 6.
Tucana Cayanensis gutture albo, Briss. Orn., 4to. tom. iv. p. 416. pl. xxxi. fig. 2, 8vo. tom. ii. p. 159.
Ramphastos erythrorhynchus, Gmel. Edit. Linn. Syst. Nat., tom. i. p. 355.—Wagl. Syst. Av. *Ramphastos*, sp. 2.—Vig. in Zool. Journ., vol. ii. p. 473.—Gould, Mon. of Ramph., pl. 3.—Less. Traité d'Orn., p. 170, *Ramphastos*, sp. 2.
Toucan à gorge blanche, Buff. Pl. Enl. 262.—Ib. Hist. des Ois., tom. vii. p. 121.
Ramphastos erythrorhynchos, Lath. Ind. Orn., vol. i. p. 136.—Gray and Mitch. Gen. of Birds, vol. ii. p. 403, *Ramphastos*, sp. 1.
Ramphastos erythrorhyncos, Vieill. Ency. Méth. Orn., Part III. p. 1429, *Ramphastos*, sp. 3.
Le Tocan, Levaill. Hist. Nat. des Ois. de Parad., tom. ii. p. 10. pl. 3.
Le Tocan à collier jaune, Levaill. Ib., p. 13. pl. 4. (With the scarlet of the breast band and under tail-coverts abstracted, says Mr. John Natterer, by exposure to light, or the heat of an oven to which it had probably been subjected to destroy the insects that had attacked the skin.)
Red-billed Toucan, Lath. Gen. Hist., vol. ii. p. 285.—Shaw, Gen. Hist., vol. viii. p. 367. pl. 47. —Ib. Nat. Misc., pl. 183.
Ramphastos Levaillantii, Wagl. Syst. Av., *Ramphastos*, sp. 3.—Less. Traité d'Orn., p. 170, *Ramphastos*, sp. 3.

This is one of the oldest known species of Toucan, a figure and description of it having been published by Petiver in 1709; it occurs among the drawings by Madame Merian, formerly in the possession of Sir Hans Sloane, and now in the British Museum (where it is represented nearly of the natural size, with a small bird between its mandibles); it is also figured by Edwards, Brisson and Borowski, and it is doubtless the bird to which Linnæus, in the 10th Edition of his "Systema Naturæ," assigned the specific appellation of *Tucanus*; as, however, this term, or rather that of *Tucana*, was applied by all the preceding writers in a generic rather than a specific sense, it becomes necessary to adopt that of *erythrorhynchus* of Gmelin for the species here represented. The synonyms given above have all reference to the present bird.

The richly ornamented and elegant *Ramphastos erythrorhynchus* is very numerously distributed over the whole of the densely wooded fluviatile regions of the river Amazon, and Mr. John Natterer found it on

the rivers Madeira, Negro and Branco; it also inhabits the low countries of Guiana, Surinam and Cayenne. It differs from every known species in the rich colouring of its bill, the brilliancy of which appears to be much greater at some seasons than at others, considerable difference in this respect having been observed in the few living examples that have reached this country, and constantly occurring in the bills of the specimens sent home for our museums. In the latter, a great difference is found to exist, the fine scarlet being more or less clouded with dull black, which may be partly attributed to the effects of the decomposition of the cellular tissues within, and partly to causes which existed while the bird was living. One of my specimens appears to have been more than usually brilliant, and differs from all others that I have seen, in having no trace of the transverse black band at the base of the red; while we frequently find the red crossed by numerous irregular and indistinct bars of dull black. It is probable that the greater or lesser brilliancy of the red colouring is dependent upon the health and vigour of the bird, and that it is more intense at the breeding-season than at any other period.

As is the case with *R. Cuvieri*, a slight difference is observable in the size of specimens from different localities; their bills also slightly vary in form, some being more swollen than others, and having the blue space at the base of the under mandible of a greater breadth: these variations are, however, too trivial to be considered as specific. Newly moulted birds have a delicate straw-coloured tinge pervading the white breast, but it soon disappears under the united influence of light and heat.

In its general habits and manners it resembles the rest of its congeners, leaping lightly from branch to branch among the topmost foliage of the lofty trees of its native forests.

Mr. Waterton states that the native name in Demerara is *Bouradi*, signifying 'nose'; that it frequents the mangrove trees on the sea-coast, and is never seen in the interior till you reach Machouchia, where it is found in the neighbourhood of the river Tacatou. It feeds entirely on the fruits of the forest, and never kills the young of other birds or touches carrion. 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*. It lays its eggs in the hollows of trees.

Although Mr. Waterton states that the bird lives entirely upon fruits in its native wilds, it exhibits the utmost partiality for animal food in a state of captivity, as shown in the account given by W. J. Broderip, Esq., of a living specimen of the present species examined by him in 1825, at a dealer's in St. Martin's Lane.

"After looking at the bird," says Mr. Broderip, "which was apparently in the highest state of health, I asked the proprietor to bring up a little bird, that I might see how the Toucan would be affected by its appearance. The proprietor soon returned bringing with him a goldfinch, a last year's bird. The instant he introduced his hand with the goldfinch into the cage of the Toucan, the latter, which was on a perch, snatched it with his bill. The poor little bird had only time to utter a short weak cry; for, within a second, it was dead, killed by compression on the sternum and abdomen, and that so powerful that the bowels were protruded after a very few squeezes of the Toucan's bill. As soon as the goldfinch was dead, the Toucan hopped with it still in his bill to another perch, and placing it with his bill between his right foot and the perch began to strip off the feathers with his bill; when he had plucked away most of them, he broke the bones of the wings and legs (still holding the little bird in the same position) with his bill, taking the limbs therein, and giving at the same time a strong lateral wrench. He continued this work with great dexterity till he had almost reduced the bird to a shapeless mass; and, ever and anon, he would take his prey from the perch in his bill, and hop from perch to perch, making at the same time a peculiar hollow clattering noise, at which times I observed that his bill and wings were affected with a vibratory or shivering motion, though the latter were not expanded. He would then return the bird to the perch with his bill and set his foot on it. He first ate the viscera and continued pulling off and swallowing piece after piece, till the head, neck, and part of the back and sternum with their soft parts were alone left; these, after a little more wrenching, while they were held on the perch and masticated as it were while they were held in the bill, he at last swallowed, not even leaving the beak or legs of his prey. It was clear to me that he felt great enjoyment; for whenever he seized his prey from the perch he appeared to exult, now masticating the morsel with his toothed bill and applying his tongue to it, now attempting to gorge it, and now making the peculiar clattering noise accompanied by the shivering motion above-mentioned. The whole operation lasted about a quarter of an hour. He then cleaned his bill by rubbing it against the perches and bars of his cage. It may be as well to mention another fact, which appears to me not unworthy of notice. I have more than once seen him return the food from his crop some time after he had taken it, and after masticating the morsel awhile in his bill, again swallow it; the whole operation, particularly the return of the food to the bill, bearing a strong resemblance to the analogous action in ruminating animals. His food consists of bread, boiled vegetables, eggs and flesh; to which a little bird is added every second or third day. He shows a decided preference for animal food, picking out all morsels of that description, and not resorting to the vegetable diet until all the former is exhausted."

The Plate represents the bird of the natural size.

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RAMPHASTOS INCA, *Gould.*

Gould & Richter, del.
Hullmandel & Walton, imp.

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RAMPHASTOS INCA, *Gould.*

Inca Toucan.

Specific Character.

Ramph. rostro nigro, in lateribus sanguineo obnubilato; culmine mandibulæ superioris ad apicem, et latâ fasciâ basali flavis, hac posticè lineâ nigrâ, anticè lineâ coccineâ cinctâ; gulâ et pectore albis flavicinctis, hoc torque sanguineo infra succincto; tectricibus caudæ superioribus aurantiacis.

General plumage black; throat and chest white tinged with yellow, and bounded below by a band of blood-red; upper tail-coverts rich orange; under tail-coverts blood-red; bill black, with a patch of pale blood-red on the sides of the upper mandible near the base, with the culmen and point of the lower mandible yellow, and with a broad basal belt of the same colour, bounded posteriorly with a narrow line of black, and anteriorly with a narrow line of scarlet, the yellow clouded with olive-blue on the lower and the cutting edge of the upper mandible; orbits yellow, passing into yellow on their outer margins; irides brown; legs and feet bluish lead-colour.

Total length, 20 inches; *bill*, $5\frac{1}{2}$; *wing*, $9\frac{1}{4}$; *tail*, 7; *tarsi*, $2\frac{1}{4}$.

Ramphastos Inca, Gould in Proc. of Zool. Soc., Part XIV. p. 68.—Gray and Mitch. Gen. of Birds, vol. iii. App. p. 19 (App. to p. 403).—Bonap. Consp. Gen. Av., p. 92, *Ramphastos*, sp. 2.

For a knowledge of this species we are indebted to Mr. Bridges, who brought a single specimen from Bolivia. It is nearly allied to *R. erythrorhynchus*, but differs from that species in having the greater part of the mandibles black; a mark of scarlet, almost triangular in form, occupying a small space on each side of the culmen only; and in having a faint line of scarlet posterior to the black colouring, which does not occur at all in the other species: the blood-red band on the breast, too, is broader and deeper coloured, and the white of the throat is more strongly tinged with yellow. A still greater distinction is, however, observable in the colouring of the upper tail-coverts, which in *R. Inca* are of a rich fiery orange, while in *R. erythrorhynchus* they are lemon-yellow. From all appearances, it is probable that the specimen brought by Mr. Bridges is a female; and if that be the case, the male, when discovered, will prove to be one of the most rich coloured species of the genus.

Mr. Bridges's specimen was procured in the elevated and dense forests at Chimorée in the country of the Yuracaras Indians in Bolivia; beyond this, I regret to say, nothing is known respecting it.

The figure is of the natural size.

RAMPHASTOS CUVIERI. *Wagl.*

Gould & Richter del.
Hadman del. & lith.

RAMPHASTOS CUVIERI, *Wagl.*

Cuvier's Toucan.

Specific Character.

Ramph. rostro tumido ad basin, brunneo-nigrescente, culmine luteo; genis, gutture, pectoreque albis lutescente-tinctis; tectricibus caudæ superioribus aurantiaco-flavis.

Male.—Crown of the head, back, wings, abdomen and tail black; throat white; breast pale yellow, bounded below by a crescent of fine deep scarlet; upper tail-coverts pale sulphur-yellow at the base, passing into rich orange; under tail-coverts deep scarlet; bill brownish black on the sides; culmen rich yellow, becoming pale horn-colour at the tip; across the base of the bill a broad band, which on the upper mandible is of a rich yellow hue, and on the under bluish lilac, the two colours blending into each other at the edges of the mandibles; immediately at the base of the bill a strong line of black; orbits bluish green, with a ring of bluish lilac around the eye; naked skin of the throat bluish green; above the orbits at the base of the upper mandible a small patch of white feathers; feet blue, with a lilac tinge on their under surface; nails black.

Total length, 23 inches; *bill*, 6½; *wing*, 9¼; *tail*, 6½; *tarsi*, 2.

Female.—Precisely similar in colour, but smaller in all her admeasurements, especially in the length of the bill.

Note.—The colouring of the soft parts differs in brilliancy at different seasons, according to the age and vigour of the bird.

Ramphastos Cuvieri, Wagl. Syst. Av. *Ramphastos*, sp. 5.—Less. Traité d'Orn., p. 171, *Ramphastos*, sp. 5.—Gould, Mon. of Ramph., pl. 2.—Ib. Sturm's Edit., pl.—Gray and Mitch. Gen. of Birds, vol. ii. p. 403, *Ramphastos*, sp. 2.—Bonap. Consp. Gen. Av., p. 92, *Ramphastos*, sp. 3.

Le Grand Toucan à gorge orange, Levaill. Hist. Nat. des Ois. de Parad., tom. ii. p. 15. pl. 5. (See note below.)

Ramphastos Forsterorum, Wagl. Syst. Av. *Ramphastos*, sp. 9.—Gray and Mitch. Gen. of Birds, *Ramphastos*, sp. 3.

When I published the first edition of this work, now nearly twenty years ago, a single specimen only of this fine Toucan had come under my notice, although I had personally examined most of the public museums and private collections in Europe; during the interval which has elapsed, much information has been obtained respecting the localities the bird inhabits, and the colouring of its soft parts, both of which were at that time comparatively unknown: I have had ample opportunities too of examining the numerous examples transmitted to England from several districts of the Lower Amazon by Messrs. Wallace and Bates, and to the Jardin des Plantes of Paris from Peru, by the celebrated traveller M. Alcide D'Orbigny. From the circumstance of so many examples being sent from the above-mentioned localities, I am induced to infer that

the whole of the extensive forests bordering the mighty Amazon, from its source amidst the lofty Andes to the sea, is inhabited by this noble bird; I have also seen numerous specimens from Venezuela, and one from Santa Fé de Bogota. Some slight difference of size occurs in examples from these distant localities, the Venezuelan specimens being smaller and having shorter bills than the Amazonian, while those from Peru and Bogota are rather larger than either of the others: these variations are, however, too slight for the birds to be considered otherwise than as races of one and the same species.

In the perfect or newly moulted plumage, the breast of both sexes is washed with yellow, which colour appears to fade under the influence of a tropical sun, leaving the breast, until the next moult, of a pure white. In some specimens a narrow thread-like line of scarlet separates the black colour of the upper mandible from the yellow culmenal ridge; and a slight tinge of red is sometimes observable near the base of the dark portion of the upper mandible of the Peruvian birds. In its affinities this species is more nearly allied to *R. erythrorhynchus* than to any other, but its rich orange-coloured upper tail-coverts will at all times enable the ornithologist to distinguish it. I mention this because the red colouring of the bill in *R. erythrorhynchus* sometimes gives place to black, a change induced either by a particular state of the bird (perhaps from being out of health), or from decomposition of the fine colour after death.

Note.—Le Grand Toucan à gorge orange of Levaillant is added as a synonym of this species on the authority of a passage in Sturm's Edition of this work, in which it is stated, that the late Mr. John Natterer had discovered that Levaillant has figured many made-up birds; and that he had recently found the originals of two of his figures in the Royal Museum at Leyden; one of which, the subject of his fifth plate, Le Grand Toucan à gorge orange, is certainly nothing more than a *Ramphastos Cuvieri* with the orange-coloured forepart of the neck, and the red of a *Ramphastos Ariel* added.

The accompanying Plate represents a fully adult Amazonian specimen of the natural size.

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RAMPHASTOS CITREOLÆMUS, *Gould.*

Gould & Richter, del. et lith.
Hullmandel & Walton, Imp.

RAMPHASTOS CITREOLÆMUS, *Gould.*

Citron-breasted Toucan.

Specific Character.

Ramph. rostro nigro, vittâ latâ basali, et culmine olivaceo viridibus, hoc colore gradatim cum flavido apud apicem mandibulæ utriusque se commiscente; gulâ albâ; pectore citreo, vittâ splendidè coccineâ cincto; tectricibus caudæ superioribus citreis.

General plumage black; throat and chest white, the latter washed with citron-yellow, which is deepest in the centre, whence it gradually fades into the white of the sides of the neck and throat; across the lower part of the breast a band of deep blood-red; upper tail-coverts sulphur-yellow; under tail-coverts deep blood-red, curving upwards at the sides and meeting at the base of the upper tail-coverts, inducing at first sight a belief that the upper tail-coverts are of two colours, blood-red and sulphur-yellow; bill black, with a broad basal and culmenal band of greenish yellow passing into pale yellow on the tips of both mandibles, and deepening into orange at the gape.

Total length, 21 inches; *bill*, $5\frac{1}{2}$; *wing*, $8\frac{1}{4}$; *tail*, $7\frac{1}{2}$; *tarsi*, $1\frac{3}{4}$.

Ramphastos citreolæmus, Gould in Proc. of Zool. Soc., Part XI. p. 147.—Gray and Mitch. Gen. of Birds, vol. ii. p. 403, *Ramphastos*, sp. 15.
——————*citreolaimus*, Bonap. Consp. Gen. Av., p. 92, *Ramphastos*, sp. 7.

An examination of the Prince of Massena's collection at Paris in 1843 afforded me an opportunity of giving a description of a species of Toucan I had never before seen. The only information I could obtain respecting this new bird, of which His Highness possessed a male and a female, was that it had been received in a collection from Santa Fé de Bogota in Columbia. In the interval that has since elapsed, the Prince's fine collection has been transported to North America, and now finds a resting-place in the extensive Museum of the Academy of Sciences at Philadelphia. Being desirous of instituting a more rigid examination of the species, and a more careful comparison of it with the allied members of the family than I was enabled to do when it first came under my notice, I applied to T. B. Wilson, Esq. of Philadelphia for another sight of it, and he has, with the utmost liberality, allowed it again to cross the Atlantic for this purpose. On re-inspecting it, I find that the conclusion I originally came to, as to its being a distinct species, is quite correct. It belongs to that section of the family, members of which are distinguished by broad culmenal marks, a feature more conspicuous in this than in any other species, the greenish yellow colour not being confined to the culmen alone, but occupying a considerable portion of the sides of the upper mandible also: the lower part of the breast is fine sulphur-yellow, passing into white on the throat and sides of the neck; the rump is fine sulphur-yellow, instead of passing into orange, as in *R. Cuvieri*, *R. culminatus*, and *R. osculans*; the bill is thick and swollen, as in the latter; but it is shorter, and on comparison will be found to present a different aspect.

The figures are of the natural size.

RAMPHASTOS OSCULANS. *Gould.*

Gould & Richter del. et lith.
Hullmandel & Walton Imp.

RAMPHASTOS OSCULANS, *Gould.*

Osculant Toucan.

Specific Character.

Ramph. rostro aterrimo, culmine fasciâque nigrâ basali flavis; pectore in medio aurantiaco, latera versus in flavescentem transeunte, gulâ regioneque paroticâ albis; lineâ pectus posticè cingente crissoque coccineis; uropygio sulphureo in aurantiacum transeunte.

General plumage jet-black; breast orange-yellow in the centre, fading off into light yellow, which again is lost in the pure white of the throat, ear-coverts, and sides of the neck; band across the breast and under tail-coverts deep blood-red; upper tail-coverts sulphur-yellow at the base, and fine orange on their apical half; bill black, with the culmen, the tip of the lower mandible, and a broad basal band fine greenish yellow, the latter washed with greenish blue towards the cutting edge of the upper and on the lower mandible; at the base of the bill a narrow line of black; orbits light greenish blue, becoming of a deeper or cobalt-blue towards the eye; eyelids dark bluish grey; outer edge of the irides bluish green, their inner edge dark greenish brown; tarsi and feet very rich light blue in front, and of a lilac hue behind.

Total length, 19 inches; *bill*, $5\frac{1}{4}$; *wing*, $7\frac{3}{4}$; *tail*, $6\frac{1}{2}$; *tarsi*, $1\frac{5}{8}$.

Ramphastos osculans, Gould in Proc. of Zool. Soc., Part III. p. 156.—Ib. Mon. of Ramph., pl. 5.—Gray and Mitch. Gen. of Birds, vol. ii. p. 403, *Ramphastos*, sp. 14.—Bonap. Consp. Gen. Av., p. 92, *Ramphastos*, sp. 6.

At the time I published the First Edition of this work, the single specimen contained in the Imperial Museum at Vienna, from which I took my figure, was, I believe, the only one that had been sent to Europe, and it is even now a rare bird in our collections. This may be due to the circumstance of its habitat being a distant and remote part of South America, rarely visited by Europeans. Mr. John Natterer, to whom I am indebted for a knowledge of its soft parts, killed it on the river Madeira; Mr. Wallace has sent it from the Rio Negro; and there is a specimen in the Museum of the Zoological Society of London, which was brought to this country from the interior of Guiana by Sir Robert Schomburgk.

It may be regarded as, without exception, one of the loveliest of the *Ramphasti*, vieing as it does in the variety of its colours with all the other members of the group. The white feathers at the side of the neck are dense, and of a pure white; the orange-yellow wash on the centre of the breast is of the most lovely tint imaginable; the tail-coverts too are of a beautiful sulphur-yellow at the base, passing into an equally beautiful orange on their apical half; and the general plumage is of the blackest jet. In the colouring of its breast it resembles *R. vitellinus*, but it differs from that species in the broad culmenal mark of yellow and in its orange-coloured upper tail-coverts. In the general colouring of the bill it resembles *R. culminatus*, but it differs from that bird in having the breast orange: again, it is nearly allied to *R. Cuvieri* and *R. citreolæmus*, but is readily distinguished from both those species by its smaller size, and by the rich colouring of its breast.

I find some slight variety in different specimens as to the amount of the scarlet on the breast: in some it assumes the form of a band, while in others it forms a large gorget-like mark, as in *R. vitellinus*: the orbits are perhaps denuded to a larger extent than in any other species; and in most of the specimens I have seen the culmen is very broad and much flattened, and moreover bulges out laterally so as to form a decided ridge on each side; but I have one example in which the bulging is not so decided, and the culmen is narrower and regularly arched. I do not, however, consider this difference to be indicative of more than a local variety.

The figures are of the natural size.

RAMPHASTOS CULMINATUS. *Gould.*

Gould & Richter del et lith.
Hullmandel & Walton, Imp.

RAMPHASTOS CULMINATUS, *Gould.*

Culminated Toucan.

Specific Character.

Ramph. rostro nigro, culmine fasciâque basali viridi-flavis; gulâ pectoreque albis.

Head, back, wings, abdomen and tail black; throat and chest white, bounded by a narrow pectoral band of blood-red; rump feathers sulphur-yellow at the base, passing into fiery orange at their tips; under tail-coverts blood-red; bill black, with the exception of the culmen, the tips of both mandibles, and a very broad band at the base of each, which are greenish yellow; orbits and feet apparently lead-colour, and the irides brown.

Total length, 19½ inches; *bill*, 5⅝; *wing*, 8½; *tail*, 7; *tarsi*, 1⅞.

Ramphastos culminatus, Gould in Proc. of Zool. Soc., Part I. p. 70.—Gould, Mon. of Ramph., pl. 1.—Ib. Sturm's Edit., pl. .—Gray and Mitch. Gen. of Birds, vol. ii. p. 403, *Ramphastos*, sp. 4.—Bonap. Consp. Gen. Av., p. 92, *Ramphastos*, sp. 4.

It is impossible to confound the present with any other known species of Toucan; its snow-white breast, which I believe is at all ages unsullied, together with the beautiful greenish yellow culmen and band at the base of the bill, and the rich orange-coloured tail-coverts, being characters which will always distinguish it; besides which, the white rises higher on the cheeks, and leaves a smaller orbit than in any other species. The specimen in my own collection was obtained in New Grenada, while another in the British Museum, the finest example of this bird I have yet seen, was collected by Mr. Wallace on the Upper Amazon. The specimen referred to in my former edition, as being in the collection of the Zoological Society, has the bill very much curved; the bill of my own specimen is formed like that of the front figure in the accompanying Plate, while the bill of the British Museum example is of an intermediate form; it is evident, therefore, that the contour of the bill is not constant: a depressed groove on each side immediately below the culmen is also found in some specimens, and not in others. Nothing whatever is known respecting the habits and economy of this bird; but I am enabled to state that the countries mentioned above are among its natural habitats, a circumstance until lately unknown. It must be regarded as one of the rarest of the true Toucans (*Ramphasti*), there being few collections in Europe which contain examples. As is the case with the other members of the genus, the sexes present no external difference, and the female is only distinguished by her somewhat smaller size.

The figures are of the natural size.

RAMPHASTOS ARIEL, *Vig.*

Gould & Richter
Hullmandel & Walton

RAMPHASTOS ARIEL, *Vig.*

Ariel Toucan.

Specific Character.

Ramph. rostro nigro ; fasciâ basali aurantiâ, culmine ad basin cœruleo ; gulâ, genis, guttureque aurantio-luteis, hujus margine inferiore sulphureo ; crisso uropygioque coccineis.

Male.—Head, back of the neck, back, wings, abdomen and tail black, with a gloss of green on the back, wings and tail ; throat rich deep orange, bounded laterally and below by a line of sulphur-yellow ; broad crescent-shaped mark across the breast, upper and under tail-coverts deep blood-red ; bill black, with the exception of a broad transversal band of orange-yellow, and the basal fourth of the culmen, which is blue ; orbits deep red ; irides and legs blue ; the hinder part of the tarsi inclining to lilac ; nails black.

Total length, 19½ inches ; *bill*, 4¾ ; *wing*, 7½ ; *tail*, 6¾ ; *tarsi*, 1¾.

Female.—Somewhat less in size, but similar in colour.

Tucana, sive Toucan Brasiliensibus, Marcg. Hist. Bras., p. 217.—Ib. Orig. Drawing in Roy. Lib. Berl. (J. Natterer.)
Tucana Brasiliensis gutture luteo, Briss. Orn., tom. iv. p. 419. pl. xxxii. fig. 1.
Le Toucan à gorge jaune du Brésil, Buff. Pl. Enl. 307.
Le Toucan de Para de l'Amérique méridionale, Vieill. Gal. des Ois., Supp.
Ramphastos Ariel, Vig. in Zool. Journ., vol. ii. p. 466.—Gould, Mon. of Ramph., pl. 10.
——— *Temminckii*, Wagl. Syst. Av., *Ramphastos*, sp. 10.—Sturm's Edit. of Gould's Mon. of Ramph., pl.
——— *Tucanus*, Gray and Mitch. Gen. of Birds, vol. ii. p. 403, *Ramphastos*, sp. 10.

The *Ramphastos Ariel* enjoys a wide range over the eastern portions of Brazil ; inhabiting, as it does, all the countries from the River Amazon to Rio de Janeiro. Considerable difference is found to exist in the birds from the southern provinces near Rio, and those from the neighbourhood of the Amazon, the latter being generally of a smaller size, and having the orange of the breast of a redder hue, and the black of the body more intense ; they cannot, however, be regarded otherwise than as varieties of one and the same species.

The following note has been kindly sent to me by His Highness the Prince Maximilian of Wied :—

" This species is very common in all the great forests and woody chains of mountains in the eastern part of the Brazils ; it usually dwells among the tops of the high trees, flying around and perching upon them, and there giving forth its whistling voice, which somewhat resembles that of the Missel Thrush (*Turdus viscivorus*) of Europe. It is very active and lively, and curious withal, its attention being easily drawn to any object ; it collects in small companies on the approach of a bird of prey, especially an owl, which they attack violently. The bird being very common, we killed many during the day for the sake of the flesh as a viand. This is one of the species, the feathers of which are used as ornaments by the aboriginal inhabitants ; thus we saw at Linhares, on the Rio Doçe, a battle-chief of the Botocudos with a yellow breast of the bird attached to each end of his bow ; while the now civilized Tubinampians used the same part of the bird to decorate either side of their foreheads."

Mr. Natterer met with this bird not far from Margaritiba, to the south of Rio de Janeiro, on the road to San Paulo, on the right bank of the Amazon, above the mouth of the Rio Tapajoz, and frequently at Para ; it appeared to follow the course of the Amazon for a certain distance ; but it was not noticed by him on the Rio Madeira, Rio Negro, or Rio Branco, where its place was supplied by *Ramphastos vitellinus*.

A fine individual of this species lived in the possession of the late Mr. Vigors for eight years, and formed the subject of the interesting account of the habits of the bird in captivity, published by him in the second volume of the 'Zoological Journal,' which work being now scarce, I shall take the liberty of transcribing therefrom those passages which are likely to be of interest to my readers :—

" When in his cage," says Mr. Vigors, " he is peculiarly gentle and tractable, suffers himself to be played with, and feeds from the hand. In general he is active and lively ; and, contrary to what might be expected

from the apparent disproportion of the bill and the seemingly clumsy shape of the birds of this genus, his appearance is not only graceful, but his movements, as he glides from perch to perch, are light and sylph-like; so much so, as to have suggested to an intelligent friend who witnessed them, the specific name I have ventured to assign to him. He keeps himself in beautiful plumage; his lighter colours being strikingly vivid, and the deep black of his upper surface, in particular, being always bright and glossy. For this fine condition he seems to be much indebted to his fondness for bathing. Every day he immerses himself in cold water with apparent pleasure, even in severe weather; and in no respect, indeed, does he appear to suffer by the transition from his own warm climate to our uncongenial atmosphere

" Besides a hollow clattering noise, he utters at times a hoarse and somewhat discordant cry, when he happens to be hungry, and to see his food about to be presented to him; on such occasions he stands erect, raising his head in the air, and half opening the bill as he emits this cry. These are the only sounds I have heard him utter, and in neither can I say that I have detected any similarity, or even approach to the word Toucan, as has sometimes been asserted, and from whence the trivial name of the genus has been supposed to originate. Neither have I been able to verify another observation which has been advanced respecting these birds, that the bill is compressible between the fingers in the living bird. The bill, notwithstanding the lightness of its substance, is firm, and capable of grasping an object with much strength. The mode in which Mr. Broderip describes his Toucan as having broken the limbs of the bird which he was about to devour, by 'a strong lateral wrench,' sufficiently shows that the bill is not deficient in power. Indeed, I observe that my bird generally takes what is offered him, rather by the sides than by the point of his bill; and I suspect that much of the powers of that member are centred in this lateral motion. The serration of the edges also may be supposed to tend to these peculiar powers.

" I have not allowed it to be indulged in that disposition to animal food, which so strikingly belongs to this family; I find, in fact, that it thrives sufficiently well upon a vegetable diet, and I fear that if it should once be allowed any other, it would be difficult to restrain its inclination for it within moderate limits. Eggs are the only animal food with which it has been supplied since it came into my possession. Of these it is particularly fond; and they are generally mixed up in his ordinary food, which consists of bread, rice, potatoes, German paste, and similar substances. He delights in fruits of all kinds. During the period when these were fresh, he fed almost exclusively on them; and even in the winter months he exhibits great gratification in being offered pieces of apples, oranges, or preserved fruits of any description. These he generally holds for a short time at the extremity of his bill, touching them with apparent delight with his slender and feathered tongue, and then conveying them by a sudden upward jerk to his throat, where they are caught and instantly swallowed. His natural propensity for preying upon animals, although not indulged, is still strongly conspicuous: when another bird approaches his cage, or even a skin or preserved specimen is presented to him, he exhibits considerable excitement. He raises himself up, erects his feathers, and utters a hollow clattering sound, which seems to be the usual expression of delight in these birds; the irides of his eyes at the same time expand, and he seems ready to dart upon his prey, if the bars of his cage permitted his approach.

" Since the cold weather has commenced, he has been brought into a room with a fire, and the unusual light seems to have interfered with his general habits; he does not go to rest so early or as regularly as was his custom; and he sometimes feeds even at a late hour. During the warmer months, however, when he was more free from interruption, his habits were singularly regular. As the dusk of the evening approached, he finished his last meal for the day, took a few turns, as if for exercise after his meal, round the perches of his cage, and then settled himself on the highest perch, disposing himself almost at the moment he alighted on it with his head drawn in between his shoulders, and his tail turned vertically over his back. In this posture he generally remained about two hours, in a state between sleeping and waking; his eyes for the most part closed, but opening on the slightest interruption. At such times he would allow himself to be handled, and would even take any favourite food that was offered him, without altering his posture further than by a gentle turn of the head. He would also suffer his tail to be replaced by the hand in its natural downward posture, and would then immediately return it again to its vertical position. In these movements the tail seemed to turn as if on a hinge that was operated upon by a spring. At the end of about two hours he began gradually to turn his bill over his right shoulder, and to nestle it among the feathers of his back, sometimes concealing it completely within the plumage, at other times leaving a slight portion of the culmen exposed. At the same time he drooped the feathers of his wings and those of the thigh-coverts, so as to encompass the legs and feet; and thus nearly assuming the appearance of an oval ball of feathers, he secured himself against all exposure to cold."

The figures are of the natural size.

RAMPHASTOS VITELLINUS, *III.*

Gould & Richter
Hullmandel & Walton

RAMPHASTOS VITELLINUS, *Ill.*

Sulphur and White-breasted Toucan.

Specific Character.

Ramph. rostro nigro; fasciâ basali cœruleo posticè lineâ nigrâ cinctâ; pectore aurantiaco-flavo in album ad latera et anticè transeunte; tectricibus caudæ superioribus et inferioribus coccineis.

General plumage black; breast orange, gradually blending with the white of the cheeks, chin, and sides of the neck; across the chest, immediately below the orange, a broad crescentic mark of deep blood-red; the upper and under tail-coverts are also blood-red; bill black, with the exception of a broad band of blue near the base and a stripe of the same hue uniting with it on the base of the culmen; orbits greenish blue; feet blue.

Total length, $19\frac{1}{2}$ inches; *bill*, $4\frac{3}{4}$; *wing*, $7\frac{3}{4}$; *tail*, 7; *tarsi*, $1\frac{3}{4}$.

Le Pignan-coin, ou Toucan à gorge jaune, Levaill. Hist. Nat. des Ois. de Parad., tom. ii. p. 19. pl. 7.

Ramphastos vitellinus, Ill.—Swains. Zool. Ill., vol. i. pl. 56.—Licht. Verz. der Doubl., p. 7. No. 22.—Gould, Mon. of Ramph., pl. 9.—Ib. Sturm's Edit., pl. .—Gray and Mitch. Gen. of Birds, vol. ii. p. 403, *Ramphastos*, sp. 9.—Bonap. Consp. Gen. Av., p. 93, *Ramphastos*, sp. 11.—Less. Traité d'Orn., p. 173, *Ramphastos*, sp. 12.—Wagl. Syst. Av., *Ramphastos*, sp. 12.

This fine species, like the *Ramphastos Ariel*, has the upper and under tail-coverts scarlet; and this so constant, that in the hundreds of specimens I have seen no indication of a yellow or orange hue has been observable: I mention this fact, because the late Mr. John Natterer once obtained a specimen which he considered to be referable to this species with the tail-coverts orange, but which I consider to have been an accidental variety or a distinct species. The native habitat of this bird is Guiana, Cayenne, I believe the Island of Trinidad, and the banks of the Amazon generally. Mr. Natterer also found it on the banks of the Rio Branco below the Sierra Caraman under the second degree of north latitude, and still further south near Barra on the Rio Negro. Specimens from Guiana are somewhat larger in size, have stronger bills, and have the orange colouring of the breast of a deeper tint and more diffused than those from the other localities; they cannot, however, be regarded as distinct, but simply as a local variety.

The figures are of the natural size.

RAMPHASTOS DICOLORUS, *Gmel.*

Gould & Richter
Hullmandel & Walton

RAMPHASTOS DICOLORUS, *Gmel.*

Green-billed Toucan.

Specific Character.

Ramph. rostro viridi-luteo, marginibus serratis rubris, fasciâ latâ basali nigrâ; pectore aurantiaco, lineâ sulphureâ cincto; abdomine caudæque tectricibus coccineis.

Crown of the head, back, wings, tail, flanks, thighs and vent black glossed with steel-blue; chin and throat delicate primrose-yellow, with a large gorget-like mark of rich orange in the centre; abdomen, upper and under tail-coverts blood-red; bill greenish yellow, becoming of a more pure yellow on the culmen; both mandibles surrounded at the base by a broad band of black; orbits red; immediately behind the nostrils a small patch of yellow feathers; irides greenish yellow, the green tint predominating so as to form a ring next the pupil; eyelash greyish blue; feet blue.

Total length, 18 inches; *bill*, $3\frac{3}{4}$; *wing*, $7\frac{1}{4}$; *tail*, $6\frac{1}{4}$; *tarsi*, $1\frac{5}{8}$.

Ramphastos dicolorus, Linn. Syst. Nat., tom. i. p. 152.—Gmel. Edit. Linn. Syst. Nat. tom. i. p. 356.—Lath. Ind. Orn., tom. i. p. 135.—Swains. Zool. Ill., vol. ii. pl. 108.—Jard. and Selby, Ill. Orn. vol. i. pl. 29.—Turt. Edit. Linn. Syst. Nat., vol. i. p. 211.—Wagl. Syst. Av., *Ramphastos*, sp. 14.—Less. Traité d'Orn., p. 173, *Ramphastos*, sp. 14.—Vieill. Ency. Méth. Orn., Part III. p. 1429. pl. 107, fig. 3.—Gould, Mon. of Ramph., pl. 11.—Ib., Sturm's Edit., pl. .—Gray and Mitch. Gen. of Birds, vol. ii. p. 403, *Ramphastos*, sp. 11.—Bonap. Consp. Gen. Av., p. 93, *Ramphastos*, sp. 14.

——— *chlororhynchus*, Temm. Man. d'Orn., tom. i. p. lxxvi.

——— *pectoralis*, Shaw, Gen. Zool., vol. viii. p. 365.

Le Tucai, Azara, Voy. dans l'Amér. Mér. Sonn. Edit., tom. iii. p. 143. No. LI.

Toucan à gorge jaune, Buff. Pl. Enl., 269.—Ib. Hist des Ois., tom. vii. p. 118.

Yellow-throated Toucan, Lath. Gen. Syn., vol. i. p. 325.—Ib. Gen. Hist. vol. ii. p. 282.

Le Petit Toucan à ventre rouge, Levaill. Hist. Nat. des Ois. de Parad., tom. ii. p. 22. pl. 8.

Ramphastos Tucai, Licht. Verz. der Doubl., p. 7. No. 23.—Wagl. Syst. Av., *Ramphastos*, sp. 13.—Less. Traité d'Orn., p. 173, *Ramphastos*, sp. 13.

It is the opinion of ornithologists generally that this bird is referable to the *Ramphastos dicolorus* of Linnæus and Gmelin, under which appellation I have accordingly retained it: if such be the case, it is certain that the habitat assigned to it by those authors (Cayenne) is decidedly incorrect; the true habitat of the species being the southern portions of Brazil and Paraguay, all, or nearly all the specimens which reach this country, coming by way of Rio de Janeiro. Mr. Natterer shot it in the forests on the road to San Paulo, but never observed it farther to the southward than the 25th degree of south latitude. It is very well described by Azara, who mentions that he met with it in the dense woods, but gives no account of its habits.

The *R. dicolorus* may be readily distinguished from every other known species by its greenish yellow bill and by its scarlet abdomen. It is so extremely common, that no collection need be without examples.

The two lower figures represent young birds in that state in which they are barely capable of providing for their own wants; the bill at this age is extremely delicate in texture, and is so soft and yielding as apparently to require the most soft and pulpy fruits, to which in all probability insects and their larvæ are added. It will be seen that in this youthful state the plumage has assumed the almost perfect colouring, the tints being scarcely less brilliant than those of the adult, and I believe that the same law prevails with regard to the other species of the family. In this respect they closely resemble the Kingfishers and other Fissirostral birds, as they also do in laying white eggs and incubating in dark recesses, especially the holes of trees.

The sexes are alike in colouring, but the female is somewhat smaller than the male.

The figures are of the natural size.

PTEROGLOSSUS ARACARI.

Gould & Richter del et lith
Hullmandel & Walton Imp

PTEROGLOSSUS ARACARI.

Cayenne Araçari.

Specific Character.

Pter. mandibulâ superiore stramineâ, maculâ latâ culminali nigrâ; inferiore nigrâ; rostro toto basi albocincto; femoribus olivaceis.

Head, neck and throat deep black; back, wings, upper tail-coverts and tail rich olive-green; primaries dark brown; rump blood-red; under surface greenish yellow, crossed on the upper part of the abdomen by a broad band of blood-red; thighs olive-brown; upper mandible straw-colour, with a broad mark of black along the culmen; under mandible black; at the base of both mandibles a raised band of straw-white; irides olive; orbits dark grey; bare skin beneath the feathers of the lower part of the sides of the neck and on the upper part of the flanks beneath the wing, deep red; legs and feet light green, their under surface tinged with olive.

Total length, 19 inches; *bill*, 5; *wing*, 6; *tail*, $7\frac{1}{4}$; *tarsi*, $1\frac{5}{8}$.

Ramphastos Araçari, Linn. Syst. Nat., tom. i. p. 151.—Ib. Gmel. Edit., tom. i. p. 354.—Lath. Ind. Orn., vol. i. p. 138.

Tucana Brasiliensis viridis, Briss. Orn., tom. iv. p. 426. tab. 33. fig. 2.

Araçari, Marcgr. Bras., p. 217.—Ray, Orn., p. 44.—Will. Orn., p. 140. tab. 22.

Grigri, Buff. Hist. Nat. des Ois., tom. vii. p. 126.

Toucan verd du Brésil, Buff. Pl. Enl., 166.

L'Araçari à ceinture rouge, Le Vaill. Ois. de Parad., tom. ii. p. 29. pl. 10.

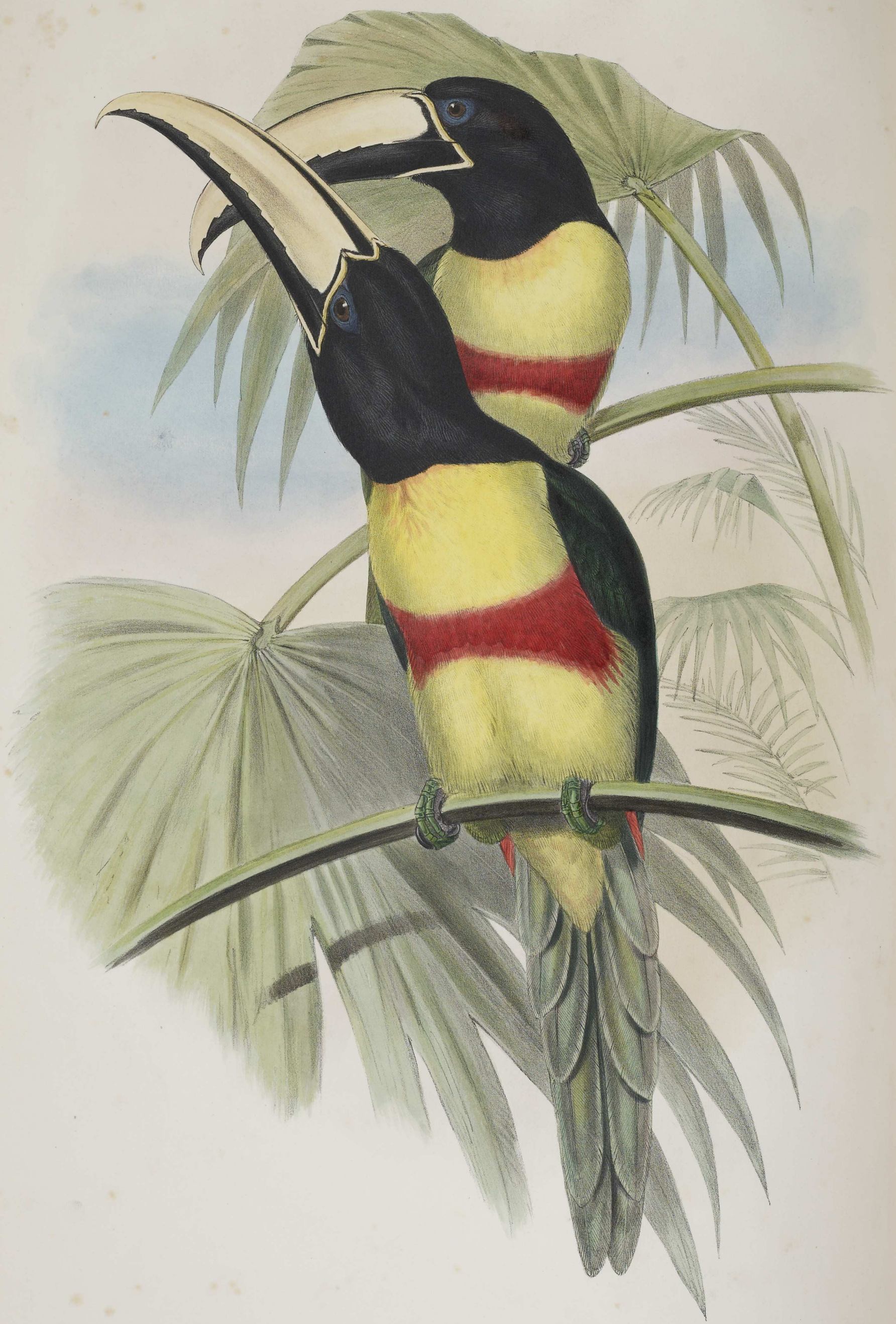
Araçari Toucan, Lath. Gen. Syn., vol. i. p. 332.—Nat. Misc., pl. 198.—Shaw, Gen. Zool., vol. viii. p. 371. pl. 49.—Lath. Gen. Hist., vol. ii. p. 290.

Pteroglossus Araçari, Ill. Prod. Syst. Mamm. et Av., p. 202.—Temm. Man. d'Orn., 2nde Edit. tom. i. p. lxxv.—Wagl. Syst. Av., *Pteroglossus*, sp. 2.—Gould, Mon. of Ramph., pl. 12.—Ib. Sturm's Edit., pl. .—Gray and Mitch. Gen. of Birds, vol. ii. p. 403, *Pteroglossus*, sp. 1.—Bonap. Consp. Gen. Av., p. 93, *Pteroglossus*, sp. 1.

There can be little doubt that it was the present bird, and not its near ally the *P. Wiedi*, which was known to Linnæus and the still earlier authors, for I find it was very correctly described by Marcgrave as long back as 1649, his description being evidently taken from a Cayenne specimen, with the strongly marked culmen: his words are, "a thick black line upon the top of the bill running the whole length, with a tail six inches long and blackish green thighs." It is also the type of Illiger's genus *Pteroglossus*. The countries of Cayenne, Guiana, Surinam, and Northern Brazil constitute its native habitat, while Bahia, Rio de Janeiro, and Southern Brazil are inhabited by the *P. Wiedi*, from which bird it may be at once distinguished by its larger size, by its strongly toothed bill, by the greater breadth of the culminal black mark, and by its chestnut thighs.

The sexes offer little difference in colour, but the female may be readily recognized by the browner tint of her ear-coverts, and her somewhat smaller size.

The figures are of the natural size.



PTEROGLOSSUS WIEDI, *Sturm.*

Gould & Richter, del. et lith.
Hullmandel & Walton, Imp.

PTEROGLOSSUS WIEDI, *Sturm.*

Prince Maximilian's Araçari.

Specific Character.

Pter. mandibulâ superiore flavido-albâ, culmine per totam longitudinem fasciâ angustâ, margine tomiorum ad basin mandibulâque inferiore nigris; rostro toto basi albocincto; femoribus viridibus.

Head, neck and throat deep black, with a very slight tinge of rufous on the ear-coverts; upper surface, wings and tail deep green; lower part of the beak and rump blood-red; upper tail-coverts green, blotched with blood-red; under surface pale greenish yellow, faintly stained with blood-red next the black of the throat and with a broad band of the same hue across the middle of the body; thighs and vent green; upper mandible creamy white, with a narrow line of black along the culmen and a conspicuous vertical mark of the same colour near the base; under mandible black; both mandibles with a raised ridge of a creamy white at the base; orbits very dark blackish grey; irides dark brown; legs greyish green.

Total length, 18 inches; *bill*, $4\frac{1}{4}$; *wing*, $5\frac{3}{4}$; *tail*, $6\frac{3}{4}$; *tarsi*, $1\frac{1}{2}$.

Pteroglossus Araçari, Prinz Max. Von Wied, Beit. zur Nat. von Bras. iv. Bd. i. Abth. p. 283.

——— *Wiedii*, Sturm's Edit. of Gould's Mon. of Ramph., pl. .

When speaking of the true *Pteroglossus Araçari*, in the first edition of this work, I remarked that I was at a loss to determine whether that bird, which is a native of Cayenne and Guiana, be identical with a somewhat similar one from the Brazils, and which, although closely resembling it in colour and size, invariably possesses characters which at once indicate its country. The variations to which I allude consist in the examples from Cayenne having the mandibles more attenuated and hooked, the teeth more defined, the black mark on the culmen much more expanded, and the black of the throat bounded by a line of fine red, which although traceable in the other is much more obscure; the thighs also are dull olive-green with strong dashes of reddish brown, so predominant in some specimens as to obscure the green entirely, while in the Brazilian birds the thighs are wholly green; besides which, I have invariably found the true Araçari to be of a larger size. Whether these differences are specific, or only to be considered as variations dependent upon difference of climate and other local circumstances, is a question not easy to determine; I am inclined, however, to believe that they constitute two distinct species. The Messrs. Sturm, after pointing out the differences above alluded to, have given to the Brazilian bird the specific appellation of *P. Wiedii*, in honour of His Highness The Prince Maximilian of Wied, a compliment most justly bestowed, since few travellers have done more to advance ornithology, or taken a greater interest in Natural History generally.

Skins of this bird are frequently found in collections from Bahia and from Rio de Janeiro. M. Natterer killed it at Mattagrossa near Borba, and also received specimens from Mattodentro, the neighbourhood of Rio de Janeiro and San Paulo. In the stomachs of those he examined were found the remains of insects and the pips of oranges.

The Prince Maximilian of Wied informs me that its voice consists of two short notes, having the sound of "*Culik! Culik!*"—that, like the *Ramphastos Ariel*, it inhabits all the great forests of the Brazils traversed by him, and that it has precisely similar habits. During the breeding season it lives in pairs; afterwards it congregates in small flocks, which fly from one tree to another in search of fruits. Their flight is performed without much motion of the wings. In the cold season they leave the forests for the plantations near the coast, become very fat, and are killed in great numbers and eaten by the inhabitants, their flesh forming excellent food. In its native wilds it may be often seen perched on the naked branches of the loftiest trees, and while perched is said to make a flirting motion of the tail similar to that of the Magpie, *Pica caudata*. Like the other species of the family, it is in the habit of assembling round and teasing the birds of prey that may visit its locality, particularly owls. The eggs are deposited in the hollows of trees, and are white and two in number.

The figures are of the natural size.

PTEROGLOSSUS PLURICINCTUS, *Gould.*

Gould & Richter, del et lith
Hullmandel & Walton, Imp

PTEROGLOSSUS PLURICINCTUS, *Gould.*

Many-banded Araçari.

Specific Character

Mas.—*Pter. rostro ad basin lineâ elevatâ flavâ cincto; culmine et basi mandibulæ superioris, mandibulâque inferiore nigris; mandibulæ superioris lateribus aurantiaco-flavis, in flavescenti-albidum versus apicem transeuntibus; gutture gastræique fasciis duabus latis, nigris; gastræo anticè flavo, coccineo maculato, posticè et uropygio coccineis.*

Male.—Head, neck and chest black; upper surface, wings and tail dark olive-green; rump blood-red; across the abdomen two broad bands of black, the spaces between which are rich yellow blotched with red; lower part of the abdomen and under tail-coverts greenish yellow largely stained with blood-red immediately behind the second black band, especially on the sides; thighs brown; along the culmen a broad mark of black united to a mark of the same hue, which passes down the base and occupies the lower angle of the upper mandible, the sides of which are orange, passing into pale yellow at the tip; under mandible black; both surrounded at the base by a raised band of rich orange-yellow; irides brown; orbits grey; legs and feet pale green.

Total length, 20 inches; *bill*, $4\frac{3}{4}$; *wing*, $6\frac{1}{2}$; *tail*, $7\frac{1}{2}$; *tarsi*, $1\frac{1}{2}$.

Female.—Differs in having the ear-coverts chestnut-brown.

Pteroglossus pluricinctus, Gould in Proc. of Zool. Soc., Part III. p. 157.—Ib. Mon. of Ramph., pl. 15.—Ib. Sturm's Edit., pl. .—Gray and Mitch. Gen. of Birds, vol. ii. p. 403, *Pteroglossus*, sp. 4.—Bonap. Consp. Gen. Av., p. 94, *Pteroglossus*, sp. 4.

One among the many beneficial results to ornithological science consequent upon the increased intercourse which has of late years taken place between Europeans and the inhabitants of the Upper Amazon and the Rio Negro, has been the acquisition of numerous examples of this fine species; all of them, however, appear to me to have been prepared by the Indians, and I very much question if, up to this time, any one of our travellers have had more than a passing glance of the bird in its native wilds; it was not procured by Mr. Wallace during his sojourn in the Rio Negro, nor was my late friend John Natterer, who resided in the Brazils for eighteen years, more fortunate, all his specimens being also procured by the Indians. That he saw it alive we know from the following note appended to the account of this species in Sturm's translation of the first edition of this work :—

"I have never been so fortunate as to have a recent example of the *Pteroglossus pluricinctus* in my hands, but I have seen five or six together in a tree near Villa de Thomar in the Rio Negro, and readily recognized them with the assistance of a glass by their conspicuous bands; that it is found as far north as the Rio Padauiri and Castanha Paraná on the Orinoco, I know from the circumstance of many skins having been brought to me by the Macunai Indians. Mr. Gould is in error when he states that I had ascertained the sexes of the specimens in the Vienna Museum by dissection, skins only having come into my possession."

I have never seen examples of this bird among the numerous collections I have examined from the Andes, a nearly allied species, the *P. pœcilosternus*, appearing to take its place in those parts of the country.

The figures are a trifle smaller than the natural size.

PTEROGLOSSUS PŒCILOSTERNUS, *Gould*

Gould & Richter del et lith
Hullmandel & Walton Imp

PTEROGLOSSUS PÆCILOSTERNUS, *Gould.*

Double-banded Araçari.

Specific Character.

Pter. rostro et corpore superiore ut in Ptero. pluricincto; *corpore inferiore sulphureo, vittâ pectorali alterâ nigrâ, alterâ sanguineâ.*

Head, neck and chest black; upper surface, wings and tail dark olive-green; rump blood-red; under surface yellow, stained with blood-red, and crossed by two bands, one on the breast black, and the other on the abdomen blood-red stained with black; thighs chestnut, slightly fringed with sulphur-yellow; along the culmen a broad mark of black, united to a mark of the same hue, which passes down the base and occupies the lower angle of the upper mandible, the sides of which are orange, passing into pale yellow at the tip; under mandible black; both surrounded by a narrow raised band of rich orange-yellow; irides brown; orbits grey; legs and feet pale green.

Total length, 18 inches; *bill*, $4\frac{1}{4}$; *wing*, 6; *tail*, $7\frac{1}{4}$; *tarsi*, $1\frac{3}{8}$.

L'Araçari à double ceinture, Le Vaill. Ois. de Parad., tom. ii. p. 32. pl. 11.

Pteroglossus pœcilosternus, Gould in Proc. of Zool. Soc., Part XI. p. 147.—Bonap. Consp. Gen. Av., p. 94, *Pteroglossus*, sp. 14.

In the account of *Pteroglossus pluricinctus*, given in the first edition of this work, I suggested that I had never seen a specimen answering to Le Vaillant's *Araçari à double ceinture*, ventured an opinion that it was quite distinct from the *Pteroglossus Araçari*, with which Le Vaillant considered it identical, and that it was probably an accidental variety of my *P. pluricinctus*. Since that period I have received many examples from Peru, according most closely with Le Vaillant's figure and description, and I can now confidently affirm that it is not only quite distinct from *P. Araçari*, but also from *P. pluricinctus*. It is very nearly allied to the latter, but differs in having the second black band which crosses the breast of that species replaced by one of bright blood-red, and in the yellow of the under surface being less stained with red: here then we have one of Le Vaillant's hitherto doubtful species identified; and had that naturalist given the bird an appellation instead of referring it to the common species, I should have had much pleasure in adopting his name instead of proposing one myself.

The native habitat of this fine bird are the forests clothing the inner dip of the Peruvian and Columbian Andes. Strings of bills of this species, which had apparently been prepared as personal decorations by the natives, are occasionally sent from Popayan, whence I infer that the bird is very numerous in that part of the country.

It may be supposed by some that the present bird is merely a local variety of *P. pluricinctus*, and such may possibly be the case; but I must remark that all the examples from the localities above-mentioned resemble the figure here given, while those from the Upper Amazon and the Rio Negro as closely agree with *P. pluricinctus*: of course it becomes necessary in a monograph to give a figure of a bird exhibiting so marked a difference.

The figure is of the natural size.

PTEROGLOSSUS CASTANOTIS. *Gould.*

Gould & Richter del. et lith.
Hullmandel & Walton, Imp.

PTEROGLOSSUS CASTANOTIS, *Gould.*

Chestnut-eared Araçari.

Specific Character.

Pter. mandibulâ superiore flavescenti-rufâ ; culmine latè nisi apice maculâque triangulari utrinque nigro ; mandibulâ inferiore nigrâ ; regione paroticâ femoribusque saturatè castaneis.

Male.—Crown of the head, sides of the neck and throat black ; ear-coverts and a broad band at the back of the neck dark rich chestnut ; upper surface, wings and tail olive-green ; under surface yellow, crossed on the abdomen with a broad band of blood-red ; a faint wash of the same hue of a gorget-like form immediately below the black of the throat ; a faint wash of the same hue also occurs on the under tail-coverts ; thighs olive ; both mandibles surrounded at the base by a raised yellow border, narrow on the upper and the sides of the lower, but broad along the under side of the latter next the throat ; upper mandible reddish yellow, with a broad triangular mark of black along the basal three-fourths of the culmen, and a nearly similar mark on each side at the base ; the intervals between the dentations also black ; under mandible black ; at the lower basal angle of each mandible and between the black of the sides and culmen of the upper mandible are marks of rich red ; irides pure white, with a black spot in the front part of the pupil, giving it an oblong appearance ; orbits blackish grey, inclining to blue ; feet greyish grass-green, darker on their under surface.

Total length, 18½ inches ; *bill*, 4¾ ; *wing*, 6⅜ ; *tail*, 7 ; *tarsi*, 1⅜.

Pteroglossus castanotis, Gould, in Proc. of Zool. Soc., Part I. p. 119.—Ib. Mon. of Ramph., pl. 13.—Ib. Sturm's Edit., pl. .—Gray and Mitch. Gen. of Birds, vol. ii. p. 403, *Pteroglossus*, sp. 2.—Bonap. Consp. Gen. Av., p. 93, *Pteroglossus*, sp. 2.

This very fine species of Araçari is spread over a great part of the interior of Brazil, its range extending to the eastern slopes of the Andes, both of Peru and of Columbia. In the Museum of Neufchatel there are fine examples brought by Dr. Tschudi from Peru, which are of a richer colour, and have stouter bills than those specimens which have been obtained in Brazil. I have traced it as far to the north on the Andean range as Santa Fé de Bogota, from whence specimens are occasionally sent. Those indefatigable collectors Messrs. Bates and Wallace appear to have met with it in great abundance, as they have sent numerous specimens from the Upper Amazon. Mr. John Natterer found it in the Brazils in the 17th degree of south latitude, and continued to meet with it as far as the western boundary of the province of Goyaz, and thence in a northerly direction beyond the Amazon. As I invariably find to be the case with all specimens from the hills, the Peruvian examples are of a larger size, apparently a more vigorous race ; they have also the dentations of the bill more strongly developed, the chestnut of the ear-coverts, sides of the face and back of the neck of a much darker hue, and the yellow of the breast and the scarlet abdominal band of a richer colour.

It is said that there is an exception to all rules, and the present bird may be cited in illustration of the proverb ; for, unlike every other member of the family, its irides are of a fine pearly white instead of the rich dark tints pervading those of the other species.

Considerable difference exists in the size of specimens from various localities. The females are always less than the males, and have the chestnut ear-coverts and sides of the neck of a much lighter hue.

The figures represent the two sexes of the natural size.

PTEROGLOSSUS TORQUATUS, *Wagl.*

Gould & Richter, del. et lith.
Hullmandel & Walton, Imp.

PTEROGLOSSUS TORQUATUS, *Wagl.*

Collared Araçari.

Specific Character.

Pter. mandibulâ superiore stramineâ, nigro-serratâ, culmine nigro ; inferiore nigrâ, fasciâ angustâ albâ, capite aterrimâ ; cervice fasciâ lunatâ castaneâ posticè cinctâ.

Head, neck and throat deep black ; at the back of the neck a semilunar mark of chestnut ; back, wings and tail olive-green ; rump and upper tail-coverts blood-red ; below the black of the throat a narrow band of blood-red ; across the breast a broad band of yellow stained with blotches of pale blood-red ; in the upper part of this yellow band a large patch of black ; below a band of black mingled with blood-red, the latter predominating on the sides ; abdomen and under tail-coverts pale yellow, the latter stained with red ; thighs chestnut-brown ; upper mandible straw-yellow ; the culmen, tip and serratures black ; on the sides at the base a wash of salmon-red in some, of a deeper and bluer tint in others ; lower mandible black ; raised ridge at the base of the mandibles white ; feet green.

Total length, 17 inches ; *bill*, 4 ; *wing*, 6 ; *tail*, $7\frac{1}{4}$; *tarsi*, $1\frac{3}{8}$.

Araçari Toucan, var. A. Lath. Gen. Hist., vol. ii. p. 290.
Pteroglossus torquatus, Wagl. in Oken's Isis, 1829, p. 508.—Sturm's Edit. of Mon. of Ramph., pl.
——— *ambiguus*, Less. Traité d'Orn., p. 173, *Pteroglossus*, sp. 14.
——— *Regalis*, Licht.—Gould's Mon. of Ramph., pl. 14.—Gray and Mitch. Gen. of Birds, vol. ii. p. 403, *Pteroglossus*, sp. 3.—Bonap. Consp. Gen. Av., p. 94, *Pteroglossus*, sp. 3.
Ramphastos torquatus, Gmel. Syst. Nat., tom. i. p. 354 ?—Lath. Ind. Orn., tom. i. p. 137 ?
Tucana Mexicana torquata, Briss. Orn., tom. iv. p. 421 ?
Collared Toucan, Lath. Gen. Syn., vol. i. p. 330 ?—Shaw, Gen. Zool., vol. viii. p. 396 ?—Lath. Gen. Hist., vol. ii. p. 287 ?

We find in the writings of the older authors—Gmelin, Latham, and others—a species of this family called *Ramphastos torquatus*, which may have been intended to indicate the present bird, but their descriptions and measurements are somewhat inapplicable ; at the same time it is the only species yet discovered having a distinct reddish collar at the back of the neck, and there is no other bird which agrees so well with their obscure descriptions. It is unquestionably the *torquatus* of Wagler ; a name, which the law of priority obliges me to adopt, as it was certainly given to the bird prior to that of *Regalis* being assigned to it by my much-esteemed friend Dr. Lichtenstein, who, as is well known, has devoted a long life to the advancement of science, and whose labours are so highly and justly valued by all who are acquainted with them ; and whose name I relinquish with regret.

The native habitat of this fine species is Southern Mexico ; but it appears to extend its range across the country, and to inhabit the forests on the shores both of the Atlantic and of the Pacific. I have specimens in my possession from Guatemala, Nicaragua, Costa Rica, and other parts of Central America ; and Messrs. Sturm speak of a specimen which they had received from Bogota ; but I think that the locality here given wants confirmation, and that some mistake must have been made in the communication to those gentlemen, as among the many collections I have seen from thence no specimen of this bird has occurred. They also mention that the irides are white, but their authority for so stating is not given. In a specimen at the British Museum, from which the eyes have not been removed, they are, even in a dried state, of a rich orange colour, and I have accordingly so represented them.

There is scarcely a more ornamental or better defined species in the whole genus than the present ; the only one with which it could be confounded is the *Pteroglossus erythropygius*, and from that species its nuchal collar at once distinguishes it. I must not omit to mention that great diversity occurs with respect to the size and form of the black spot on the chest ; in some it is nearly obsolete, in others a large round patch, and in others it assumes a triangular shape ; nor must I fail to notice that the bill is nearly as broad as it is deep, much flattened at the base of the culmen, and correspondingly developed at the sides, presenting an appearance of massiveness and strength.

The pretty Orchid figured on the accompanying Plate is the *Maxillaria leptosepala*.

The front figure represents a male of the natural size ; the hinder one is somewhat reduced.

PTEROGLOSSUS ERYTHROPYGIUS, *Gould.*

Gould & Richter, del. et lith.
Hullmandel & Walton, Imp.

PTEROGLOSSUS ERYTHROPYGIUS, *Gould.*

Red-rumped Araçari.

SPECIFIC CHARACTER.

Pter. dorso inferiore, uropygio, et caudæ tectricibus splendidè sanguineis; corpore inferiore flavo, pectore superiore sanguineo tincto, inferiore vittâ coloribus nigro et sanguineo commixtis, fasciatâ.

Crown of the head, sides of the face, chin and upper part of the back shining greenish black; wings and tail dull brownish green; lower part of the back, rump and upper tail-coverts rich blood-red; under surface yellow, stained on the chest with blood-red, and crossed on the breast by a band of mingled black and blood-red; thighs chestnut; bill bordered at the base by a narrow line of dull white; the remainder of the bill yellowish horn-colour, with a broad stripe of black along the upper mandible near the cutting edge and a narrow line in the centre of the culmen; upper mandible black.

Total length, 18 inches; *bill*, 5; *wing*, $6\frac{1}{4}$; *tail*, $7\frac{1}{2}$; *tarsi*, $1\frac{1}{4}$.

Pteroglossus erythropygius, Gould in Proc. of Zool. Soc., Part XI. p. 15.—Ib. Zool. of the Voy. of H.M.S. Sulphur, Birds, p. 45. pl. 28.—Gray and Mitch. Gen. of Birds, vol. ii. p. 404, *Pteroglossus*, sp. 15.—Bonap. Consp. Gen. Av., p. 94, *Pteroglossus*, sp. 15.

THE great country lying to the northward of the Isthmus of Panama has a fauna which is in a great measure peculiarly its own; it is true, that generically many of the forms are the same as those of other tropical portions of America, but the species are unquestionably different. The accompanying Plate represents one if not two species of *Pteroglossus*, and there is at least another, belonging to the same genus, which appears to be exclusively an inhabitant of Central America, by which I would be understood to mean in a wide sense—Mexico. I have said that the accompanying Plate represents either one or two species; and it will be seen that some difference occurs in the figures which were taken from two unique specimens, one in my own collection, the other in the Museum of the United Service Institution. The latter, which is represented in the foremost figure, formed part of the collection made by R. B. Hinds, Esq., Surgeon R.N., the naturalist attached to the Expedition under Captain Sir Edward Belcher, R.N., of H.M.S. Sulphur, and was obtained at Realejo, on the shores of the Pacific in Central America: the precise locality in which the specimen in my own possession was procured is not known with certainty.

Mr. Hinds's bird differs from mine in being of a much larger size, in having the under mandible of a nearly uniform straw-white, and the breast much less stained with scarlet. If hereafter it should be found that the two birds are different species, the term *sanguineus* might not be an inappropriate name for the smaller bird. Both the specimens or species in question are nearly allied to the *Pteroglossus torquatus* of Wagler (*P. regalis* of Lichtenstein, and of the former edition of this work), but the total absence of the crescentic brown collar at the nape of the neck will at all times distinguish them from that species: the markings of their bills are also very different.

The specific name of *erythropygius* was given to this bird to indicate the rich scarlet colouring of its rump, which hue is also extended over the whole of the upper tail-coverts.

The figures are of the natural size.

PTEROGLOSSUS HUMBOLDTI

Gould & Richter, del et lith.
Hullmandel & Walton Imp.

PTEROGLOSSUS HUMBOLDTI, *Wagl.*

Humboldt's Araçari.

Specific Character.

Mas.—*Pter. rostro majore; mandibulâ superiore flavescenti-aurantiacâ, culmine, lineâ basali cingente, maculâque ad singulam serraturam nigris; mandibulâ inferiore nigrâ, ad basin flavescenti-aurantiaco cinctâ.*

Male.—Head, neck, throat and chest black; back, wings and tail olive-green; upper tail-coverts crimson; primaries blackish brown; under surface yellow, tinged with green on the flanks; thighs chestnut; upper mandible yellowish orange, the culmen, tip, a line down the sides near the base, and a narrow irregular mark above each serrature black; under mandible black, bounded at the base with orange-yellow; orbits, in front of the eye greenish blue, above and behind purer blue, beneath lilac, between which and the purer blue is a triangular mark of scarlet; irides dark carmine; legs and feet dark green.

Total length, 16 inches; *bill*, 4; *wing*, $5\frac{1}{2}$; *tail*, $6\frac{1}{2}$; *tarsi*, $1\frac{3}{8}$.

Female.—Sides of the face, ear-coverts, throat and chest chestnut; in all other respects similar to the male.

Pteroglossus Humboldtii, Wagl. Syst. Av., *Pteroglossus*, sp. 4.—Gould, in Proc. of Zool. Soc., Part III. p. 157.—Gould, Mon. of Ramph., pl. 22.—Ib. Sturm's Edit., pl. .—Gray and Mitch. Gen. of Birds, vol. ii. p. 404, *Pteroglossus*, sp. 11.—Bonap. Consp. Gen. Av., p. 94, *Pteroglossus*, sp. 12.

This species, although known to us for nearly thirty years, having been first discovered in the western parts of Brazil, by Spix and Martius, previous to 1824, is still very rare in collections. Its native country is the extensive and almost unexplored forests of the Upper Amazon and the Rio Madeira; it was in the latter country that M. Natterer obtained his specimens, and it is to him that I am indebted for the colouring of the soft parts, he having kindly communicated them to me during his sojourn in London, when on his return from the Brazils to Vienna; and they may therefore be depended on.

Mr. Wallace, who procured specimens on the southern bank of the Amazon above the Rio Madeira, informs me that, like the Curl-crested Araçari (*Pteroglossus Beauharnaisi*), it is very local, and that, as is also the case with some other members of this family, a river often forms the boundary of its habitat; a feature which I frequently observed to occur with respect to Australian birds, both in Van Diemen's Land and on the continent of Australia.

This fine species is very nearly allied to *P. inscriptus*, and exhibits a similar style of markings on the sides of the bill; but the much larger size of the bird and the entire black colouring of the under mandible readily distinguish it from that species.

The Plate represents the two sexes of the natural size.

PTEROGLOSSUS INSCRIPTUS. *Swains.*

Gould & Richter del et lith
Hullmandel & Walton Imp

PTEROGLOSSUS INSCRIPTUS, *Swains.*

Lettered Araçari.

Specific Character.

Mas.—*Pter. rostro stramineo, nigro serrato; culmine, apice, fasciâque basali nigris; capite colloque atris; crisso coccineo.*

Fœm.—*Gula brunnea.*

Male.—Head, neck and throat glossy black; back, wings and tail dark olive-green; rump blood-red; under surface lemon-yellow; thighs externally olive-green, internally pale brown; bill straw-yellow, with a basal band of black and a black culmen and tip, the serrations also marked by irregular bands of black; raised ridge at the base of the bill straw-yellow; irides dark carmine; orbits very gaily coloured, the different colours separated by a fold in the skin; the portion above and before the eye light cobalt-blue; below the eye violet-grey, behind which is a triangular mark of yellowish carmine; tarsi dark green.

Total length, 13 inches; *bill*, 3; *wing*, $4\frac{3}{8}$; *tail*, $5\frac{1}{2}$; *tarsi*, $1\frac{1}{8}$.

Female.—Similar to the male, except that the throat is dark chocolate-brown instead of black.

Pteroglossus inscriptus, Swains. Zool. Ill., vol. ii. pl. 90.—Wagl. Syst. Av., *Pteroglossus*, sp. 5.—Gould's Mon. of Ramph., pl. 23.—Ib. Sturm's Edit., pl. .—Bonap. Consp. Gen. Av., p. 94, *Pteroglossus*, sp. 13.—Less. Traité d'Orn., p. 175, *Pteroglossus*, sp. 5.—Gray and Mitch. Gen. of Birds, vol. ii. p. 404, *Pteroglossus*, sp. 12.

——— *scriptus*, Temm. Man. d'Orn., tom. 1. p. lxxvi.

The great forests clothing the low alluvial land of South America to the north of the Equator, through which flows the majestic Amazon, constitute the natural habitat of this elegant little species. Hitherto it has been supposed that it was confined to the remote parts of Guiana and Cayenne; but that it enjoys a very extensive range is proved by the circumstance of Mr. John Natterer having found it in the woods on the River Guapore, in the vicinity of Cidade de Mattagrosso (formerly called Villabella), in the 15th degree of south latitude, near Borba, where the Madeira flows into the Amazon, and near Para, which lies between the first and second degrees of south latitude. It is from this latter locality that the specimens from which my figures were taken were sent by Mr. Wallace.

A glance at the accompanying Plate will at once indicate to the reader why this bird has been named *inscriptus*, as it will be seen that the markings of the bill offer a considerable resemblance to Hebrew characters, which circumstance has obtained for it the trivial name of the Lettered Araçari. We find it stated in Sturm's Edition of this Monograph, on the authority of Mr. Natterer, that it lives in families, and feeds principally on berries. The beautiful plant figured in the accompanying Plate, *Bilbergia iridifolia*, was copied from a drawing made by Miss Hamilton Smith, whose talents as an artist are only equalled by her many other acquirements and amiable disposition.

The colouring of the orbits of this bird is very varied and beautiful, and is carefully represented on the accompanying Plate, from a drawing given to me by Mr. John Natterer, a sufficient guarantee for its accuracy. The female may be distinguished from the male by the brown, instead of black colouring of her throat; in other respects the sexes are very similar. As is the case with other species, the bills of individuals differ somewhat in appearance; the letter-like markings varying in form, and the black mark at the base of the lower mandible being more extensive in some than in others: the Messrs. Sturm have figured an immature bird, from which we learn that in the youthful state the letter-like markings are very faintly indicated, and the black mark at the base of the lower mandible is much smaller than in the adult.

The Plate represents the two sexes of the natural size.

PTEROGLOSSUS VIRIDIS.

Gould & Richter del. et lith.
Hullmandel & Walton, Imp.

PTEROGLOSSUS VIRIDIS.

Green Araçari.

Specific Character.

Mas. *Mandibulâ superiore culmine flavo; â lateribus castaneo-rufis, suprà lineâ longitudinali nigrâ; mandibulâ inferiore nigrâ, ad basin coccineâ; capite colloque nigris.*

Fœm. *Capite colloque castaneis.*

Male.—The whole of the head, neck and throat glossy black; back, wings, upper tail-coverts, tail and thighs olive-green; rump deep blood-red; under surface greenish yellow; sides of the upper mandible and a small space round the nostrils rich chestnut-red, bounded above by a line of black; culmen yellow, cutting edge white; at the base of the under mandible a triangular mark of scarlet, the remainder black, passing into blue immediately before the scarlet; bare skin before and below the eye rich deep blue, gradually becoming paler and more beautiful, and with a greenish tinge on the upper part in front of the eye, and of a paler blue bounded by a mark of deep red above and behind the eye; irides reddish chestnut; legs grass-green, becoming of a bluer tinge on their under surface.

Total length, $13\frac{1}{2}$ inches; *bill*, $3\frac{1}{4}$; *wing*, $4\frac{3}{4}$; *tail*, $5\frac{1}{2}$; *tarsi*, $1\frac{1}{4}$.

Female.—Similar to the male, except that the head, neck and throat are rich chestnut, fringed on the latter with black.

Ramphastos viridis, Linn. Syst. Nat., tom. i. p. 150.—Ib. Gmel. Edit., tom. i. p. 353.—Lath. Ind. Orn., vol. i. p. 138.—Shaw, Nat. Misc., pl. 717.
Tucana Cayanensis, Briss. Orn., tom. iv. p. 423. pl. xxxiii. fig. 2.—Ib. 8vo. tom. ii. p. 162.
Toucan verd de Cayenne, Buff. Pl. Enl., 727, 728.—Ib. Hist des Ois., tom. vii. p. 127.
Yellow-breasted Toucan, Edw. Glean., pl. 329.
Green Toucan, Lath. Gen. Syn., tom. i. p. 131.—Shaw, Gen. Zool., vol. viii. p. 370. pl. 48.—Lath. Gen. Hist., vol. ii. p. 288.
Pteroglossus viridis, Ill. Prod., p. 202.—Swains. Zool. Ill., vol. iii. pl. 169.—Wall. Syst. Av., *Pteroglossus*, sp. 6.—Gould, Mon. of Ramph., pl. 21.—Gray and Mitch. Gen. of Birds, vol. ii. p. 403, *Pteroglossus*, sp. 8.—Bonap. Consp. Gen. Av., p. 94, *Pteroglossus*, sp. 8.
L'Araçari verd, Levaill. Hist. Nat. des Ois. de Parad., pp. 41, 43. pls. 16, 17.
Ramphastos glaber, Lath. Ind. Orn., tom. i. p. 138.
Smooth-billed Toucan, Lath. Gen. Syn., Supp., p. 67.—Shaw, Gen. Zool., vol. viii. p. 375.—Lath. Gen. Hist., vol. ii. p. 280.
Pteroglossus brevirostris, Less. Traité d'Orn., p. 198?

This species of Araçari is distributed over Guiana, Cayenne, and the adjacent northern countries of tropical America, where it would seem to be very abundant, few collections being sent from thence to Europe which do not comprise specimens of both sexes. The living example which ornamented the Gardens of the Zoological Society in 1844, afforded me an opportunity of ascertaining the colouring of the soft parts, which are correctly represented on the accompanying Plate, and which were previously unknown.

As will be seen, there is a marked difference in the colouring of the sexes, the female having the head, neck and throat chestnut instead of black, as in the male.

The Plate represents the two sexes of the natural size.

PTEROGLOSSUS BEAUHARNAISI, *Wagl.*

Curl-crested Araçari.

Specific Character.

Pter. plumis capitis, genarum, nuchæque foliiferis, illius crispis nigris, harum spatulatis, genarum stramineis nigro apiculatis.

Descr.—Crown of the head clothed with curled horn-like appendages of an intense and glossy black, which as they approach the occiput gradually lose their curled character and become straight, narrow and spatulate; the cheeks clothed with similar appendages, straight, narrow, of a more decidedly spatulate form, and of a pearly white tipped with black; occiput, back, and a band across the rump deep blood-red; lower part of the back, wings and tail very deep green; primaries brown; upper tail-coverts deep green, with a crescent of reddish brown near the tip; all the under surface yellow, the feathers of the breast fringed in a crescentic form with blood-red, and the flanks largely stained with the same hue, traces of which also occur on the vent and under tail-coverts; culmen of the bill chocolate-red at the base, passing into the orange-red of the apical half; next the culmen a stripe of bluish green, the remainder of the upper mandible chocolate-red, with the exception of a line along the serratures which is white; under mandible yellowish white, except at the tip which is orange; both mandibles bounded at the base with a narrow band of dull red; orbits blue, passing into green behind the eye and with a narrow line of blood-red next the appendages of the crown; irides red; thighs olive; legs and feet green. Total length, 18 inches; *bill*, 4; *wing*, $5\frac{3}{4}$; *tail*, $7\frac{1}{2}$; *tarsi*, $2\frac{1}{4}$.

Pteroglossus Beauharnaisii, Wagl. in Unterh. "das Ausland," 1830, no. 118. S. 470.—Ib. Oken's Isis, 1832, S. 280.—Gould, Mon. of Ramph., Sturm's Edit. pl. .—Gray and Mitch. Gen. of Birds, vol. ii. p. 404, *Pteroglossus*, sp. 16.—Bonap. Consp. Gen. Av., p. 95, *Pteroglossus*, sp. 16.

——— *Pœppigii*, Wagl. Oken's Isis, 1832, S. 1230.—Gray and Mitch. Gen. of Birds, vol. ii. p. 404, *Pteroglossus*, sp. 17.

——— *lepidocephalus*, Nitzsch.

——— *ulocomus*, Gould in Proc. of Zool. Soc., Part I. p. 38.—Ib. Mon. of Ramph., pl. 18.

Beauharnasius ulocomus, Bonap. in litt.

This may be considered not only the finest of the *Pteroglossi*, but the most beautiful of the *Ramphastidæ*; it is moreover rendered conspicuously remarkable by the singular structure of the glossy and curiously curled appendages clothing the crown, which we find it impossible to do justice to; they can only be compared to the horn-like feathers decorating some species of the *Gallinæ*,—the extreme ends of the neck- and wing-feathers of the *Gallus Sonnerati* for instance. This structure appears to consist of a dilatation of the shaft of each feather, or perhaps an agglutination as it were of the webs into one mass.

In 1830, and the three following years, several examples of this bird were transmitted to Europe, some of which found a resting-place in England, and others on the continent, principally in Germany. Almost simultaneously, the bird from its great beauty and interest attracted the notice of various ornithologists, and several specific appellations were assigned to it, Wagler calling it *P. Beauharnaisii*, Nitzsch *P. lepidocephalus*, and myself, unaware of either of those names having been given, proposing that of *ulocomus*:

that of Wagler, however, having the priority, is the one now adopted; and will always be retained with pleasure, as perpetuating the name of his late Imperial Highness the Duke of Leuchtenberg, a prince who took a most lively interest in the study of Natural History, and whose premature decease every lover of that branch of science must therefore earnestly deplore. During the last five years, several travellers have visited the countries watered by the upper tributaries of the Amazon, the native habitat of this bird, and, as might be naturally expected, many examples have been procured and transmitted to Europe. Natterer found it in the forests near Monaquiri, at the mouth of the Rio Negro; Mr. Wallace, who has more recently killed and sent home specimens from the Upper Amazon, states that it is exceedingly local, and that he only met with it on the south side of the Amazon above the Rio Madeira, and is not aware of its having been found higher up, although it is believed that Professor Pœppig found it on the eastern dip of the Peruvian Andes: Mr. Wallace adds, that in the districts he mentions, it appeared in great numbers in the month of July, when certain fruits on which it feeds are abundant. The sexes, like the other *Pteroglossi*, present little or no difference in their colouring, a trifling disparity in the size of the female being the only external guide by which to distinguish that sex: the colouring of the soft parts and the bill are taken from the notes of M. Natterer and Mr. Wallace, and their accuracy may therefore be depended on.

The figures represent the two sexes of the natural size. The plant is the *Sida integerrima*.

By the inhabitants of its native country it is called Mulatto Araçari.

PTEROGLOSSUS BITORQUATUS. *Vig.*

Gould & Richter, del.t et lith.
Ensmandel & Walton, Imp.

PTEROGLOSSUS BITORQUATUS, *Vig.*

Double-collared Araçari.

SPECIFIC CHARACTER.

Pter. mandibulâ inferiore albidâ, fasciâ obliquâ apicali nigrâ ; gulâ guttureque castaneis, hoc subtus nigro marginato ; torque pectorali angustâ sulphureâ.

Malè.—Head black ; sides of the neck and throat chestnut, bordered below by a narrow band of black, to which succeeds a similar one of sulphur-yellow ; breast, back of the neck and rump blood-red ; abdomen and under tail-coverts sulphur-yellow, the latter tinged with rufous ; thighs olive ; upper surface, wings and tail dark olive-green ; upper mandible greenish yellow ; under mandible white, with an oblique mark of black occupying the apical half ; both mandibles bounded at the base with a narrow raised belt of white, within which is a thread-like line of white, and on the lower mandible a broader line of black ; irides orange-coloured, with a black spot on each side at their inner margin, giving the pupil an horizontal-oval appearance ; round the eye a greenish grey ring, the remainder of the orbits beautiful vermilion-carmine red ; legs dark greyish green.

Total length, 14 inches ; *bill*, $3\frac{1}{12}$; *wing*, $4\frac{7}{8}$; *tail*, $5\frac{3}{4}$; *tarsi*, $1\frac{1}{4}$.

Pteroglossus bitorquatus, Vig. in Zool. Journ., vol. ii. p. 481.—Gould, Mon. of Ramph., pl. 16.
—Ib. Sturm's Edit., pl. .—Gray and Mitch. Gen. of Birds, vol. ii. p. 403, *Pteroglossus*, sp. 5.—Bonap. Consp. Gen. Av., *Pteroglossus*, sp. 5.
——— *nigridens*, Wagl.

THIS bird was first characterized as new to science by the late Mr. Vigors, who took the description given by him in the second volume of the "Zoological Journal" above-quoted, from a fine specimen then in his possession, but since transferred to the Museum of the Zoological Society of London ; and who states that the specific name *bitorquatus* was suggested by the two narrow bands, one of yellow, the other of black, which surrounds the chest.

In my former account of this species, I spoke of it as being remarkable for its rarity as well as its beauty and elegance of form,—Mr. Vigors's specimen, one in the collection of the late Earl of Derby, and a third in the Museum at Berlin, being all that had then come under my notice ; the bird is, however, no longer rare, numerous specimens having been recently transmitted to this country and to the continent. My own collection contains fine examples procured by Mr. Wallace in the neighbourhood of Para, on the Lower Amazon ; and other specimens, also procured by that gentleman in the same locality, form part of the National collection.

The Messrs. Sturm state, in their edition of this work, that the yellow crescent is only found on the breast of the females, and that the male is entirely devoid of it ; but I suspect that this is not always the case, as it is very conspicuous in one of the specimens at the British Museum, which I have no doubt is that of a male. To those gentlemen I am also indebted for the following description of the soft parts, the colouring of which was previously unknown to me :—"Iris orange-coloured, with a black spot on its inner margin on each side, so that the pupil appears horizontal-oval ; ring surrounding the eye grey ; the rest of the orbits beautiful red, such as would be produced by mixing carmine and vermilion."

The Plate represents this species in a state of excitement at the sight of a snake ; it must not, however, be understood that the bird feeds upon these animals ; they are merely so represented to show how readily (as mentioned by Prince Maximilian of Wied) they are excited by the sudden appearance of any unwonted object.

The figures represent the two sexes of the natural size.

PTEROGLOSSUS STURMI, *Natt.*

Gould & Richter, del et lith.
Hullmandel & Walton, Imp.

PTEROGLOSSUS STURMI, *Natt.*

Sturm's Araçari.

Specific Character.

Pter. mandibulâ superiore sordidè viridi-flavâ; mandibulâ inferiore totâ nigrâ ad apicem viridi-flavâ; nuchâ, pectore, epigastrio uropygioque coccineis.

Crown of the head deep black; cheeks and throat chocolate-brown, bordered posteriorly with a crescentic mark of chestnut-black, below which is a broader crescent of yellow; nape, upper part of the back, the breast and the rump bright blood-red; back, wings and tail dark olive-green; primaries brownish black, narrowly edged with olive-green; under surface of the wings dull yellow; centre of the abdomen yellow; lower part of the abdomen and under tail-coverts dull greyish yellow; thighs olive-green; upper mandible dull greenish yellow, passing into bluish green at the base, becoming almost white on the cutting edge, and having an oblong spot of black at each denticulation; under mandible black except at the point, which is dull greenish yellow; raised band on the sides of the mandibles at the base ochreous yellow; irides dark brown; orbits dark bluish grey, bounded above by a streak of dull carmine-red; legs and feet dark greyish green.

Total length, $14\frac{1}{2}$ inches; *bill*, $3\frac{1}{8}$; *wing*, 5; *tail*, $5\frac{3}{4}$; *tarsi*, $1\frac{1}{4}$.

Pteroglossus Sturmii, Natt. in Imp. Mus. of Vienna.—Sturm's Edit. of Gould's Mon. of Ramph., pl. .

The solitary example of this fine species contained in the Imperial Museum at Vienna is the only one that has yet been sent to Europe. It was brought down by the late Mr. John Natterer, on the 22nd of January, 1830, out of a small flock flying in the primitive forests at Borba near the mouth of the Rio Madeira. It proved to be a fine male in the adult dress, and, after his return to Europe, was named by him *Pteroglossus Sturmii*, in honour of one or other of the brothers Sturm of Nuremberg, who have included a figure and description of it in their translation of the first edition of this work. As I have never seen the bird myself I have been obliged to copy their figure, and it is only fair to them to give their remarks upon its alliance, and the differences by which it is distinguished.

"This species differs from the very similar *Pteroglossus bitorquatus* in having the under mandible entirely black, instead of black with a white base; in having a dark brown iris instead of orange with a black spot on each side near its inner margin; in the orbits being dark blue grey, with a border of dull carmine-red near the feathers of the crown instead of the eye-rings being grey, and the remainder of the orbits beautifully mingled carmine and vermilion; and in the pale yellow crescentic mark on the breast, which does not exist in the male *P. bitorquatus*, and which is narrower and of a brighter yellow in the female of that species. The reasons which induced M. Natterer to regard this bird, of which it is true he had only received a single specimen, as distinct, was the circumstance of its being a fully adult bird, and that in the case of several other species, as the *Pteroglossi maculirostris*, *Gouldi*, *Nattereri*, *Langsdorffi*, *Reinwardti*, the specific distinctions reside almost exclusively in the beak."

The figure is of the size of life.

PTEROGLOSSUS AZARÆ, *Wagl.*

Graeb. & Richter, del. & lith.
Hallmandel & Walter, imp.

PTEROGLOSSUS AZARÆ.

Azara's Araçari.

Specific Character.

Pter. rostro stramineo-flavo ; mandibulæ superioris lateribus maculâ longitudinali rufâ.

Male.—Crown of the head black ; back of the neck dark chestnut-red ; upper surface very dark green ; primaries black, edged with very dark green ; rump deep blood-red ; cheeks and throat blackish chestnut, bounded below by a narrow line of deep black ; across the breast a broad crescentic mark of blood-red ; on the upper part of the abdomen a broad band of black tinged with green ; lower part of the abdomen and under tail-coverts yellow, stained with blood-red next the black band ; thighs olive ; bill delicate straw-yellow, with a broad streak of red along the sides of the upper mandible, bounded below by an interrupted narrow line of orange ; irides dark carmine-red ; orbits immediately round the eye dark greenish grey, inclining to indigo-blue, and with a patch of red at the anterior angle above, and another in the posterior angle behind the eye ; legs green.

Total length, $14\frac{3}{4}$ inches ; *bill*, $3\frac{5}{8}$; *wing*, 5 ; *tail*, $5\frac{3}{4}$; *tarsi*, 1.

Female.—Similar in colour, but with the chestnut hue of the throat paler, and the black mark bounding it below more conspicuous than in the male.

L'Aracari Azara, Levaill. Hist. Nat. des Ois. de Parad., Supp., p. 40. t. A.

Ramphastos Azara, Vieill. 2nde Edit. du Nouv. Dict. d'Hist. Nat., tom. xxxiv. p. 283.—Ib. Ency. Méth. Orn., part iii. p. 1431.

Pteroglossus Azaræ, Vieill. Gal. des Ois., tom. ii. pl. et p. (not numbered).—Wagl. Syst. Av., *Pteroglossus*, sp. 3.—Gray and Mitch. Gen. of Birds, vol. ii. p. 403, *Pteroglossus*, sp. 6.—Bonap. Consp. Gen. Av., *Pteroglossus*, sp. 6.—Sturm's Edit. of Gould's Mon. of Ramph., pl.

It gives me great pleasure to figure this, the true *P. Azaræ* of Levaillant, from very recently killed specimens sent to this country by Mr. Wallace from the Rio Negro on the Amazon ; by means of which I am enabled to give a representation of the colouring of the soft parts as they appear in life : it will be seen that they give a very beautiful appearance to the bird, and consequently add materially to its interest. Since the publication of the first edition of this work, numerous examples have been sent to this country, principally, however, by Sir Robert Schomburgk, who collected them during his expeditions into the interior of British Guiana. Little difference in size exists between this species and *P. flavirostris* ; it is, however, the smaller of the two ; but, with the exception of the bill, the two birds are precisely alike in their colouring : it is certainly one of the most elegant species of the genus, and it is much to be regretted that nothing is known of the habits and economy of so beautiful a bird.

The figures represent the two sexes of the size of life.

PTEROGLOSSUS FLAVIROSTRIS, *Fras.*

Gould & Richter, del. et lith.
Hullmandel & Walton, Imp.

PTEROGLOSSUS FLAVIROSTRIS, *Fras.*

Yellow-billed Araçari.

SPECIFIC CHARACTER.

Pter. rostro stramineo-flavo; tomiæ, mandibulæ superioris emarginationibus nigris; mandibulâ inferiore aurantio tinctâ.

Male.—Crown of the head black; back of the neck between the shoulders dark chestnut-red; upper surface, wings and tail very dark green; primaries black, edged with very dark green; rump deep blood-red; cheeks and throat blackish chestnut, bounded below by a narrow line of deep black; across the breast a broad crescentic mark of blood-red; on the upper part of the abdomen a broad band of black, tinged with green; lower part of the abdomen and under tail-coverts yellow, stained with blood-red next the black band, particularly on the sides; thighs olive; bill delicate straw-yellow, with a narrow streak of black along the serrations of the upper mandible, and a broad streak of orange-yellow along the cutting edge of the lower mandible; irides dark carmine-red; orbits immediately round the eye dark greenish grey, inclining to indigo-blue, and with a patch of red in the anterior angle above, and another in the posterior angle behind the eye; legs green.

Total length, $15\frac{1}{2}$ inches; *bill*, $3\frac{3}{4}$; *wing*, $5\frac{1}{4}$; *tail*, $6\frac{1}{2}$; *tarsi*, $1\frac{1}{8}$.

Female.—Similar in colour, but with the chestnut hue of the throat paler, and the black mark bounding it below more conspicuous than in the male.

Pteroglossus Azaræ, Gould's Mon. of Ramph., pl. 17.
——— *flavirostris*, Fras. in Proc. of Zool. Soc., Part VIII. p. 60.—Sturm's Edit. of Gould's Mon. of Ramph., p. .—Gray and Mitch. Gen. of Birds, vol. ii. p. 403, *Pteroglossus*, sp. 7.—Bonap. Consp. Gen. Av., p. 94, *Pteroglossus*, sp. 7.

FROM the time I published my first drawing of this species, now nearly twenty years ago, until very lately, I have been greatly perplexed respecting the specimen in the Museum of the Jardin des Plantes at Paris from which it was taken, inasmuch as none of the numerous examples sent to this country agreed with it, and it was only upon a more careful examination of it on a late visit, that I discovered that the specimen had been partly manufactured, the second broad scarlet band across the abdomen having been substituted for the few stains of that colour which occur in the genuine specimens:—this practice of malversating species cannot be too forcibly deprecated, tending as it does to produce inextricable confusion.

We learn from Sturm's Edition of this work, that the indefatigable Mr. John Natterer met with this species near Marabitana, on the 14th of May 1831, at which time it was moulting, and again on the 4th of June, in the woods on the banks of the River Xie, a tributary of the Upper Rio Negro; and that Professor Pœppig also met with it on the Amazonas, in the province of Maynas in Peru; and I have very fine specimens from New Grenada.

The *Pteroglossus flavirostris* may be at once distinguished from *P. Azaræ* by the uniform straw-yellow colouring of its upper mandible, or in other words, by being without any trace of the red streak along that portion of the bill which is so conspicuous in *P. Azaræ*; and by its having a streak of orange along the lower mandible, which part of the bill in *P. Azaræ* is entirely free from markings of any kind; in every other respect the two species are alike in colour.

The figures represent the two sexes of the natural size.

PTEROGLOSSUS MARIÆ, *Gould*.

Gould & Richter del. et lith.
Hullmandel & Walton Imp.

PTEROGLOSSUS MARIÆ, *Gould.*

Duchess of Leuchtenberg's Araçari.

Specific Character.

Pter. mandibulâ superiore pallidè stramineo-flavâ unicolore, maculis ad tomias nigris; inferiore ochraceo-flavo unicolore.

Crown of the head black; nape, upper part of the back and rump very deep blood-red; back, wings and tail dark olive-green; primaries black, edged with dark olive-green; cheeks and throat chocolate, bordered below by a narrow line of black, beyond which is a broad crescentic band of rich blood-red, succeeded by a still broader band of dull black; remainder of the under surface pale yellow, stained with blood-red immediately behind the black band, particularly on the sides; under surface of the wings pale yellow; thighs dark olive; upper mandible straw-yellow, with a narrow interrupted streak of black along the denticulations; under mandible uniform ochreous-yellow; at the base of both mandibles a narrow raised band of pale yellow; irides crimson; orbits deep blood-red, with a ring of cobalt-blue next the pupil; legs and feet olive-green.

Total length, 14 inches; *bill*, 3; *wing*, $4\frac{3}{8}$; *tail*, $5\frac{5}{8}$; *tarsi*, 1.

The Banded Araçaris are some of the most striking and beautiful of the forest birds inhabiting the borders of the River Amazon. They constitute a little group unequalled among the Toucans for the grace and elegance of their form, and are distinguished above all others by the rich colouring of their under surface, with the curl-crested species at their head as the largest, and the present diminutive one at the other extremity. As the name *Beauharnasius*, in honour of the late Duke of Leuchtenberg, has long been associated with this group as the specific appellation of the former, I have thought it not inappropriate to name the smaller species in honour of the widow of a prince distinguished for his love and support of science, and whose premature death all naturalists must deplore.

The native habitat of this species is the woods clothing the sides of the Lower Amazon, whence numerous specimens have been sent by Mr. Hawkswell; all of which were precisely alike, both in size and in colouring. The species to which the present bird is most nearly allied is the *P. flavirostris*, but it differs in being of a smaller size, in the uniform colouring of the upper mandible, in which there is no trace of the orange mark beneath the nostrils so observable in that species, and in the lower mandible being wholly ochraceous, instead of being straw-white with a streak of ochraceous along the side only.

The sexes appear to be precisely alike in colour, and it is only by her somewhat smaller size that the female may be distinguished from the male.

SELENIDERA MACULIROSTRIS.

Gould & Richter, del. et lith.
Hullmandel & Walton Imp.

SELENIDERA MACULIROSTRIS.

Spotted-billed Toucanet.

Specific Character.

Mas.—Sel. mandibulâ superiore ad latera maculis transversis nigris irregulariter fasciatâ.

Male.—Crown of the head, nape, throat and chest deep shining black; ear-coverts deep orange, crossing obliquely a tuft of pale yellow; crescentic mark at the nape pale yellow; back, wings and upper tail-coverts rich olive-green; primaries brown, margined externally with olive; tail dark olive-green, inclining to brown, the six central feathers tipped with chestnut; abdomen yellowish green; flanks orange; thighs mingled rufous and green; under tail-coverts crimson; bill whitish horn-colour; culmen and tips of both mandibles pale green; sides washed with pale bluish green; upper mandible crossed by irregular bars of black, and the lower one by a single nearly vertical band of the same hue near the apex, meeting an oblique mark on the upper mandible; orbits fine yellowish green; inner circumference of the irides yellow, outer pale green, clouded anterior and posterior to the pupil with dark brown; tarsi and toes dark green.

Total length, 13 inches; *bill*, $2\frac{1}{4}$; *wing*, $5\frac{1}{8}$; *tail*, $5\frac{1}{4}$; *tarsi*, $1\frac{1}{4}$.

Female.—Crown of the head, throat and breast reddish brown, inclining to chestnut on the former; flanks pale orange; ear-coverts reddish olive; in every other respect the plumage of the female resembles that of the male; the bill is also very similar, but is not so richly coloured, and has the transverse markings less defined and not so numerous.

After death the delicate green colouring of the mandibles disappears and leaves the sides more horny.

Pteroglossus maculirostris, Licht. Verz. der Doubl., p. 7. No. 25.—Wagl. Syst. Av., *Pteroglossus*, sp. 9.—Gould, Mon. of Ramph., pl. 24.—Ib. Sturm's Edit., pl. .—Gray and Mitch. Gen. of Birds, vol. ii. p. 404, *Pteroglossus*, sp. 20.

L'Araçari Koulik mâle du Brésil, Le Vaill. Ois. de Parad., tom. i. p. 39. pl. 15.—Female, Ib. Supp., p. 41. fig. A, A.

Ramphastos maculatus, Vieill. Gal. des Ois., tom. ii.—Supp. texte et pls. mâle et femelle.—Jard. & Selby, Ill. Orn., vol. i. pl. 26.

Janeiro Toucan, Lath. Gen. Hist. of Birds, vol. ii. p. 292. pl. xxx. female.

Selenidera maculirostris, Bonap. Consp. Gen. Av., p. 95, *Selenidera*, sp. 2.

This is generally regarded as the commonest of the Toucanets, few collections of any magnitude being without examples; in reality, however, it is not more common than the other species of the genus, which are simply more rare with us, because their native localities have been less frequently visited by collectors.

The portions of South America in which it appears to be most abundant are the southern and eastern districts of Brazil, where it frequents the virgin forests and subsists upon fruits and berries; it is probable that it also feeds upon caterpillars and other insects, but this is at present unascertained.

The following note has been kindly communicated to me by His Highness Prince Maximilian of Weid, to whom my thanks are due:—

The *S. maculirostris* "appears to be less abundant in the eastern parts of Brazil than the other species observed by me. Its mode of life and economy were precisely similar to those of the Common Araçari. On the Rio Belmonte and the Rio Parde it was known by the name of *Arassari-poka*. The length of a fresh-killed male was 13 inches; breadth 16 inches."

The Plate represents two males and a female of the natural size.

SELENIDERA GOULDI.

Gould & Richter, del. et lith.
Hullmandel & Walton, Imp.

SELENIDERA GOULDI.

Gould's Toucanet.

Specific Character.

Mas.—*Sel. mandibulâ superiore nigrâ, apicem versus lividè corneâ, apice albâ, fasciâque angustâ albâ ad basin; mandibulâ inferiore albâ fasciâ nigrâ, apiceque lividè corneo, pedibus plumbeis.*

Male.—Crown, nape, throat and chest deep shining black; ear-coverts deep orange, posterior to which is a second tuft of yellow, the two crossing obliquely; at the nape a crescent of pale yellow; back, wings and upper tail-coverts rich olive-green; primaries dark brown, externally margined with olive; tail dark olive-green, inclining to brown; six middle feathers tipped with chestnut; abdomen yellowish green; flanks orange; thighs rufous; under tail-coverts crimson; upper mandible black, bounded along the serratures and posteriorly with white, and bordered next the face with a very narrow line of greenish yellow; under mandible yellowish white, crossed near the apex with a band of black, and bordered at the base with greenish yellow; tips of both mandibles very delicate green; orbits pea-green; irides pea-green, with a circle of pale yellow next the pupil; feet green.

Total length, 13 inches; *bill*, $2\frac{1}{4}$; *wing*, 5; *tail*, 5; *tarsi*, $1\frac{1}{4}$.

Female.—Head, neck, throat and breast reddish brown, inclining to chestnut on the former; ear-coverts reddish olive; in all other points the plumage is the same as in the male; the bill is also very similar, but not so brightly coloured, and moreover has the greenish yellow mark at the base of the under mandible dilated into a triangular form.

Pteroglossus Gouldii, Natt. in Proc. of Zool. Soc., Part V. p. 44.—Sturm's Edit. of Gould's Mon. of Ramph., pl. .—Gray and Mitch. Gen. of Birds, vol. ii. p. 404, *Pteroglossus*, sp. 19.

Pteroglossus (*Selenidera*) *Gouldii*, Gould, Icon. Av., pl. .

Selenidera Gouldi, Bonap. Consp. Gen. Av., p. 95, *Selenidera*, sp. 1.

This bird was figured for the first time in my "Icones Avium," from specimens presented to the Zoological Society of London by the late M. John Natterer of Vienna, who had procured them on the banks of the River Madeira in Brazil, and who at the Meeting of the Society, held on the 11th of April, 1837, had been pleased to name the species after myself. Since that period a great number of examples have come under my notice from the banks of the River Amazon, which may be considered one of the natural localities of the bird: all these specimens correspond in every respect with M. Natterer's; none of them exhibiting a tendency to partake of the characters of *S. maculirostris*, to which the species is very nearly allied, but from which it differs in the single large patch of black on the upper mandible, in the more intense orange colouring of the sides of the body, and in a slight diversity in the colouring of the orbits and irides.

Although I have been so fortunate as to see many examples, it is a species seldom found in collections, and may be considered one of the rarest of the genus.

The Plate represents two males and a female of the natural size.

SELENIDERA LANGSDORFFI.

Gould & Richter, del. et lith.
Hullmandel & Walton, Imp.

SELENIDERA LANGSDORFFI.

Langsdorff's Toucanet.

Specific Character.

Mas.—*Sel. rostro nigrescente prope basin in cinereo-flavum transeunte, serraturis pallidis.*

Male.—Head, neck, throat and breast black; ear-coverts orange, crossing obliquely a tuft of yellow feathers; at the nape a crescent of bright yellow; upper surface and wings greenish olive; primaries dark brown, margined externally with olive; flanks rich orange; lower part of the abdomen mingled olive and yellow; thighs dark chestnut; under tail-coverts crimson; tail dark greenish olive, the six middle tail-feathers tipped with chestnut; orbits yellowish green; irides blackish brown; bill black, becoming paler on the serratures, and passing into greenish horn-colour at the base; legs and feet green.

Total length, 13 inches; *bill*, $2\frac{5}{8}$; *wing*, 5; *tail*, 5; *tarsi*, $1\frac{1}{4}$.

Female.—Head and back of the neck deep chestnut-red; throat and breast pale chestnut-red; ear-coverts olive-yellow; remainder of the plumage similar to that of the male, but the nuchal collar and the hue of the other parts much less brilliant.

Pteroglossus Langsdorffii, Wagl. Syst. Av., *Pteroglossus*, sp. 12.—Gould in Proc. of Zool. Soc., Part III. p. 157.—Gould, Mon. of Ramph., pl. 28.—Ib. Sturm's Edit., pl. .—Gray and Mitch. Gen. of Birds, vol. ii. p. 404, *Pteroglossus*, sp. 23.

Selenidera langsdorffi, Bonap. Consp. Gen. Av., p. 95, *Selenidera*, sp. 5.

The only example of the present bird that had come under my notice, when the first edition of this work was published, was the original specimen in the Munich Collection, from which the late Dr. Wagler took his description for the Monograph of the group contained in his valuable "Systema Avium:" since then, examples of both sexes have been received by me from the banks of the Amazon, whence its range would seem to extend to the eastern slopes of the Peruvian Andes, as we find it mentioned in "Froriep's Notices," dated from "Pampayaco am Huallago" in eastern Peru, and I have myself received examples from that country.

Some of my specimens were shot at Ega on the Upper Amazon, where it doubtless replaces the *S. maculirostris* of eastern Brazil, from which it may be readily recognized by its more robust form, and by the more uniform and sombre colouring of its bill. In the colouring of their plumage the two birds are very similar; the orange spot on the sides, however, is always of a deeper and richer hue in the present species. It is by no means a common bird, there being few collections in which examples are to be found.

Froriep gives the following account of the habits of the species:—

"Always observed in couples fluttering from branch to branch, and never flying very far, not even when frightened by the huntsman, which is probably due to the shortness of its wings. Its voice resembles that of a Crow, and when uttered, the body is placed upright, with the head bent back on the shoulders and the bill directed upwards; it is only in this position that its cry is emitted or its food swallowed. In a state of nature it searches for its food after the manner of the Woodpecker, boring into the nests of the Termite Ants with which the branches of the forest trees are covered. In captivity it is omnivorous, but may be easily kept upon insects, especially the caterpillar of the larger ants, and becomes very tame in a few days."

The Plate represents a male and a female of the natural size.

SELENIDERA NATTERERI, *Gould.*

Gould & Richter del et lith.
Hullmandel & Walton, Imp.

SELENIDERA NATTERERI, *Gould.*

Natterer's Toucanet.

Specific Character.

Mas.—*Sel. rostro rubro, ad apicem flavescenti-albido; lineâ culminali, maculâ ad latera utriusque mandibulæ, maculâque supra singularem serraturam viridi; serraturis albis.*

Male.—Head, neck, throat and breast black; ear-coverts pale lemon-yellow, passing into dull orange; at the nape a crescent of pale yellow; upper surface, wings and tail olive-green; tips of the six middle tail-feathers chestnut; flanks orange, passing into the chestnut of the thighs; under tail-coverts dull crimson; bill red; culmen light green; a patch on the side of each mandible near the base and a small irregular mark above each of the serratures dull dark green; serratures white; tips of both mandibles yellowish white; orbits dull deep green; irides crimson; eyelash blue; legs and feet dull green.

Total length, 13 inches; *bill*, $2\frac{5}{8}$; *wing*, $5\frac{1}{4}$; *tail*, 5; *tarsi*, $1\frac{3}{8}$.

Female.—Head and neck reddish chestnut, under surface of a similar but paler hue; ear-coverts chestnut-yellow; the remainder of the plumage as in the male, except that there is only a faint tinge of the orange hue on the flanks.

Pteroglossus Nattereri, Gould in Proc. of Zool. Soc., Part III. p. 157.—Gould, Mon. of Ramph., pl. 25.—Ib. Sturm's Edit., pl. .—Gray and Mitch. Gen. of Birds, vol. ii. p. 404, *Pteroglossus*, sp. 21.

Selenidera Nattereri, Bonap. Consp. Gen. Av., p. 95, *Selenidera*, sp. 3.

In the first edition of this Monograph, I remarked, that "although I have at all times endeavoured to avoid imposing a specific title on a new species, which did not convey some idea connected with its form and colouring, I have been induced to deviate from this rule in the present instance, from an earnest desire to pay a just tribute of respect to a most able naturalist, through whose personal exertions in the Brazilian forests for the long period of eighteen years, a vast collection has been transmitted to Vienna, the capital of that country by the munificence of whose government he was enabled to prosecute his researches." Shortly after this paragraph was written, myself and every lover of natural history had to lament the loss of this ornament to science; I, however, had the satisfaction of knowing that I had perpetuated the name of my friend by naming this species after him. At that time the specimens in the Imperial Museum, from which my figures were taken, were the only examples in Europe; in the interval which has elapsed, many others have come under my notice: I believe M. Natterer's specimens were collected on the Rio Madeira; Sir Robert Schomburgk brought numerous examples from the far interior of British Guiana; and Mr. Wallace observed it on the Upper Rio Negro; consequently the forests bordering the tributaries of the Upper Amazon, towards the Andes, may be considered the habitat of this fine species.

At present nothing whatever is known as to its habits and economy.

The Plate represents the two sexes of the natural size.

SELENIDERA REINWARDTI.

Gould & Richter, del. et lith.
Hullmandel & Walton, Imp.

SELENIDERA REINWARDTI.

Reinwardt's Toucanet.

Specific Character.

Mas.—*Sel. rostri dimidio basali sordide sanguineo-rufo; culmine, apice, serraturisque nigrescenti-brunneis.*

Male.—Head, neck, throat and chest black; ear-coverts orange, crossing obliquely a tuft of yellow feathers; at the nape a crescent of yellow; upper surface and wings brownish olive-green; primaries blackish brown, margined externally with olive; flanks rich orange; abdomen mingled green and yellow; thighs rufous; under tail-coverts crimson; tail dark olive-green, the six middle feathers tipped with chestnut; orbits dark green; irides dark red, with a bluish lash; basal two-thirds of both mandibles dull blood-red; culmen, tips of both mandibles and interspaces of the serratures black; legs and feet green.

Total length, $13\frac{1}{4}$ inches; *bill*, $2\frac{5}{8}$; *wing*, 5; *tail*, 5; *tarsi*, $1\frac{1}{4}$.

Female.—Head and neck dark chestnut; throat and breast paler chestnut; ear-coverts olive; the remainder of the plumage as in the male, but much less brilliant; irides brown.

Pteroglossus Reinwardti, Wagl. Syst. Av., *Pteroglossus*, sp. 11.—Gould in Proc. of Zool. Soc., Part III. p. 157.—Gould, Mon. of Ramph., pl. 26.—Ib. Sturm's Edit., pl. .—Gray and Mitch. Gen. of Birds, vol. ii. p. 404, *Pteroglossus*, sp. 22.

Selenidera Reinwardti, Bonap. Consp. Gen. Av., p. 95, *Selenidera*, sp. 4.

The single specimen of this bird in the Munich Collection was the only one known when the first edition of this work was published; during the interval of twenty years that has since elapsed, several other examples have been sent to Europe, and individuals of both sexes now form part of my own collection; these latter were collected on the eastern slopes of the Andes, in the rich country of Peru. Sir William Jardine, Bart., has just received an example from Professor Jameson of Quito, which I believe was procured from the banks of the River Napo, while the Munich specimen was from the western borders of Brazil; we may infer, therefore, that the great primæval forests skirting the eastern dip of the Andes for ten degrees on either side of the equator are its true and natural habitat. Although the colouring of its bill assimilates somewhat to that of *S. piperivora* and *S. Nattereri*, the bird is quite distinct from both of them. In the several specimens that I have seen, I have observed much difference in the thickness of the bill, some being much more dilated than others; and I am not sure that this is not an indication of their being two species: the specimens in the Philadelphia Museum, and a female in my own, have the bills much thicker than the one in the Munich Museum, and than that belonging to Sir William Jardine. It is one of the rarest of the Toucanets.

The figures represent the two sexes of the size of life, on a plant sent to me by Thomas Reeves, Esq., of Rio de Janeiro.

SELENIDERA PIPERIVORA.

Gould & Richter, del. et lith.
Hullmandel & Walton, Imp.

SELENIDERA PIPERIVORA.

Culik Toucanet.

Specific Character.

Mas. *Sel. rostro nigro, basin versus in rubrum transeunte; capite collo pectoreque nigris; corpore superiore olivaceo-viridi.*

Fœm. *Cervice castaneâ; jugulo pectoreque cinereo, viridi-lavatis.*

Male.—Crown of the head, back of the neck, throat and breast glossy black; ear-coverts and crescent-shaped mark at the base of the neck behind rich orange-yellow; upper surface deep oil-green; wings and tail deep green, the feathers of the latter tipped with chestnut; lower part of the abdomen olive-green, mixed with yellow; thighs mingled chestnut and green; under tail-coverts blood-red; basal fourth of the upper and basal half of the lower mandible red, the remainder black, a few of the serrations near the gape white; orbits beautiful green, with a streak of blue on their upper margin; irides red; legs green.
Total length, 13½ inches; *bill*, 3; *wing*, 4½; *tail*, 4½; *tarsi*, 1⅜.

Female.—Crown of the head black; back of the neck chestnut; throat and chest grey, washed with green; under surface yellowish olive; thighs brownish olive; the other parts as in the male.

Ramphastos piperivorus, Linn. Syst. Nat., tom. i. p. 150.—Gmel. Edit., vol. i. p. 353.—Bor. Nat., tom. ii. p. 92.—Lath. Ind. Orn., tom. i. p. 138.—Vieill. Ency. Méth. Orn., part iii. p. 1433.
Tucana Cayanensis torquata, Briss. Orn., tom. iv. p. 429. pl. xxxii. fig. 2.—Ib. 8vo, tom. ii. p. 163.
Koulik, Buff. Hist. Nat. des Ois., tom. vii. p. 128.
Toucan à collier de Caienne, Buff. Pl. Enl., 577, male.
Toucan à ventre gris, Ib., 729, female.
Green Toucan, Edw. Glean., pl. 330.
Piperine Toucan, Lath. Gen. Syn., tom. i. p. 334.—Id. Supp., p. 67.—Shaw, Gen. Zool., vol. viii. p. 372.—Lath. Gen. Hist., vol. ii. p. 291.
Pteroglossus Culik, Wagl. Syst. Av., *Pteroglosus*, sp. 10.—Gould, Mon. of Ramph., pl. 27.
L'Araçari Koulik de la Guyane, Levaill. Hist. Nat. des Ois. de Parad., tom. ii. pp. 35, 37. pls. xiii. xiv.
Pteroglossus piperivorus, Sturm's Edit. of Gould's Mon. of Ramph., pl. .—Gray and Mitch. Gen. of Birds, vol. ii. p. 404, *Pteroglossus*, sp. 24.
Selenidera piperivorus, Bonap. Consp. Gen. Av., p. 95, *Selenidera*, sp. 6.

This species inhabits Cayenne and the whole of the low fluviatile countries bordering the river Amazon, from its embouchure to Barra on the Rio Negro, whence I have received specimens. It differs in some slight degree from the typical species of the genus *Selenidera*; more, however, in its colouring than in its structure, in which it is very similar; the difference in the colouring too is principally in the female, which in lieu of the nuchal crescent of yellow observable in the females of the other species, has a broad band of chestnut, and instead of the usual lively chestnut colouring of the under surface, has that part greyish green.

This bird is known in the countries it inhabits by the name of Culik, from the peculiarity of its cry, and is said to feed principally on peppers, which induced Linnæus to give it the specific name of *piperivorus*.

The Plate represents the two sexes of the natural size.

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ANDIGENA LAMINIROSTRIS, *Gould*

Gould & Richter, del. et lith.
Hullmandel & Walton, Imp.

ANDIGE

And. rostro ad basin cocc
subtus cinereo-cyaneo.

Crown of the head and ba
brownish black ; rump
slaty grey, four centra
on either flank a larg
blood-red ; culmen an
the upper mandible a
side of the upper m
coloured plate or lam
and detached in front
of the mandible below
Total length, 18 inches

Andigena laminirostris,

For our knowledge of this
who discovered it in the fores
that country. At the time
single specimen had been s
Philadelphia, was kindly len
describing. Since that time
collection.

It is certainly one of the
feature in its laminated bill
unknown to us, and we are
the other members of the fa
be the females ; if so, they h

The figures are of the natu

ANDIGENA LAMINIROSTRIS, *Gould.*

Laminated Hill Toucan.

Specific Character.

And. rostro ad basin coccineo; culmine et apice nigris; lateribus laminatis corneis; corpore subtus cinereo-cyaneo.

Crown of the head and back of the neck deep black; upper surface golden brown; primaries brownish black; rump pale greenish yellow; upper tail-coverts very dark green; tail dark slaty grey, four central feathers largely tipped with chestnut-red; under surface ashy blue; on either flank a large patch of rich yellow; thighs deep chestnut; under tail-coverts blood-red; culmen and apical half of both mandibles black; a broad band on the base of the upper mandible and the basal half of the lower mandible deep blood-red; on either side of the upper mandible, immediately in front of the blood-red base, is a large buff-coloured plate or lamina, continuous with the structure of the bill posteriorly, but separate and detached in front, dilated on its upper edge, thicker and projecting beyond the edge of the mandible below; feet slaty blue.

Total length, 18 inches; *bill*, $3\frac{3}{8}$; *wing*, $6\frac{3}{4}$; *tail*, $6\frac{3}{4}$; *tarsi*, $1\frac{1}{2}$.

Andigena laminirostris, Gould, in Proc. of Zool. Soc., 1850, p. 93.

For our knowledge of this fine new species we are indebted to the researches of M. Jules Bourcier, who discovered it in the forests at the base of Pichincha, in Ecuador, during his recent official sojourn in that country. At the time I described the bird in the "Proceedings of the Zoological Society," only a single specimen had been sent to Europe, which, having become the property of T. B. Wilson, Esq., of Philadelphia, was kindly lent to me by his brother, E. Wilson, Esq., for the purpose of figuring and describing. Since that time two more specimens have been sent to Paris, and now form part of my own collection.

It is certainly one of the most extraordinary of the Toucans yet discovered, inasmuch as it possesses a feature in its laminated bill not found in any other species; the particular use of this lamination, if any, is unknown to us, and we are equally ignorant as to its habits and economy. Like the *A. hypoglaucus*, and all the other members of the family, this species differs considerably in size; probably the smaller birds may be the females; if so, they have the lamination of the bill quite as strongly developed as in the male.

The figures are of the natural size.

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ANDIGENA HYPOGLAUCUS. *Gould.*

Gould & Richter, del et lith.
Hullmandel & Walton, Imp.

ANDIGENA HYPOGLAUCUS, *Gould.*

Grey-breasted Hill Toucan.

Specific Character.

And. mandibulis lineâ basali circumdatis, maculâ triangulari subbasali nigrâ plagâque viridi-flavâ nigro-marginatâ notatis ; superioris culmine lateribusque antrorsum saturate sanguineis, inferiore, nisi basin versus, atrâ ; corpore inferiore cœruleo-cano.

Crown of the head and occiput black ; back, shoulders and thighs rich reddish brown ; outer edges of the primaries and secondaries green, inner edges brown ; rump light greenish yellow ; upper tail-coverts greenish olive ; tail blackish olive, the four middle feathers tipped with brown ; the whole of the under surface and the collar surrounding the neck silvery grey ; at the base of the upper mandible a narrow line of yellow, succeeded by a nearly triangular mark of black ; an irregular mark of greenish yellow next succeeds, edged by a line of black ; the culmen and the remainder of the sides dull red ; the basal half of the under mandible has the yellow, black and greenish yellow colouring of the upper, but its apical half is black instead of red ; feet blue.

Total length, 18¼ inches ; *bill*, 4 ; *wing*, 6¾ ; *tail*, 7 ; *tarsi*, 1¾.

Pteroglossus hypoglaucus, Gould, in Proc. of Zool. Soc., Part I. p. 70.—Ib. Mon. of Ramph., pl. 19.—Ib. Sturm's Edit., pl.—Gray and Mitch. Gen. of Birds, vol. ii. p. 403, *Pteroglossus*, sp. 9.—Bonap. Consp. Gen. Av., p. 94, *Pteroglossus*, sp. 9.

Little more is now known respecting this species than was recorded in the first edition of this work, nearly twenty years ago. The two specimens from which my figure was taken had been sent to me by my valued correspondent D. Christie, Esq., of Popayan, and I have never received a third example ; the celebrated traveller M. Delattre, however, met with it in his rambles, and sent two or three specimens to Europe, one of which is in the Museum of the Jardin des Plantes at Paris, the other in the British Museum. The bill of the latter specimen is very short, while that of the example in the Jardin des Plantes is fully as long as I have represented it in the former edition of my Monograph ; and, as well as the specimen in the British Museum, is in every respect richer in colour, particularly in the greenish yellow on the sides of the mandibles ; the yellow of the rump too is extremely beautiful and well-defined, while the back is ornamented with a collar of bluish grey. The harlequin-like markings of the bill in this species not only render it conspicuously different from the other members of its genus, but from every other species of the family.

The Grey-breasted Araçari is an inhabitant of the mountains, and is only to be found on the highest wooded portion of the Andes, for which elevated and cold situations the full and downy texture of its plumage admirably adapts it, a feature equally characteristic of the three other species of this form since discovered. The specific name given to this bird refers to the beautiful silvery lustre which pervades the fine grey tints spread over the breast and under surface.

The figures are of the natural size.

ANDIGENA CUCULLATUS. *Gould.*

Gould & Richter, del. et lith.
Hullmandel & Walton, Imp.

ANDIGENA CUCULLATUS, *Gould.*

Hooded Hill Toucan.

Specific Character.

And. rostro flavo, nisi tertiâ parte apicali, et maculâ oblongâ utrinque ad basin mandibulæ inferioris, nigris; dorso, humeris, apicibusque tectricum alarum majorum aureo-oleagineis; uropygio autem et tectricibus caudæ superioribus viridi-flavis infectis.

Crown of the head and occiput deep glossy black; at the back of the neck a broad crescentic mark of blue-grey; back, shoulders and tips of the wing-coverts golden olive, passing into the greenish yellow of the rump and under tail-coverts; greater wing-coverts, outer webs of the primaries and secondaries dark green, their inner webs brownish black; sides of the face and throat sooty black, gradually blending with the dark bluish grey of the under surface; under tail-coverts crimson; thighs chestnut; bill yellow, clouded with green for two-thirds of its length from the base and black for the remainder of its length, the under mandible with an oblong irregularly-shaped patch of black on each side near the base; feet greenish lead-colour.

Total length, 18 inches; *bill*, 4; *wing*, 7; *tail*, 7½; *tarsi*, 2.

Pteroglossus cucullatus, Gould in Proc. of Zool. Soc., Part XIV. p. 69.—Gray and Mitch. Gen. of Birds, vol. iii. App. p. 19 (App. to p. 404).—Bonap. Consp. Gen. Av., p. 95, *Pteroglossus*, sp. 18.

This singular Toucan appears to have escaped the notice of every traveller in Bolivia, except Mr. Bridges; which is the more surprising, as the celebrated M. D'Orbigny and other French naturalists have collected extensively in that country:—I say surprising, because one can scarcely conceive how so remarkable a bird could have been unseen by them. Mr. Bridges found it in the forests of Cocapata, in the department of Cochabamba, and brought three specimens to this country, one of which is now in the British Museum, and the other two in that of the late Earl of Derby. Such, then, is all the information that is known respecting this fine Toucan; a Toucan, which differs from all its congeners in the dense and hairy character of its plumage, and in the absence of any distinct mark on the rump.

Much diversity occurs in the size of the three specimens above-mentioned, but they are precisely similar in colour: the one in the British Museum is the smallest of the three, and is doubtless a female.

The figures are of the natural size.

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ANDIGENA NIGRIROSTRIS.

Gould & Richter, del et lith.
Hullmandel & Walton, Imp.

ANDIGENA NIGRIROSTRIS.

Black-billed Hill Toucan.

Specific Character.

And. rostro nigro; gulâ albâ; corpore inferiore pallidè cyaneo.

Crown of the head and back of the neck glossy black; back, wing-coverts and margins of the primaries sienna-brown; secondaries bluish brown; tail very dark bluish green, the four central feathers largely, and the next on each side slightly tipped with chestnut; upper tail-coverts sulphur-yellow; throat white, the white tinged with blue, proceeding across the sides of the neck, and nearly meeting at the back; breast and abdomen pale chalky blue; thighs rich chestnut; under tail-coverts blood-red; feet greenish blue, with a lilac tinge on their under surface.

Total length, 19 inches; *bill*, $4\frac{1}{4}$; *wing*, $6\frac{3}{4}$; *tail*, $7\frac{3}{4}$; *tarsi*, $1\frac{5}{8}$.

Pteroglossus nigrirostris, Waterh. in Proc. of Zool. Soc., Part VII. p. 111.—Gray and Mitch. Gen. of Birds, vol. ii. p. 404, *Pteroglossus*, sp. 18.—Bonap. Consp. Gen. Av., p. 94, *Pteroglossus*, sp. 10..

——— *melanorhynchus*, Sturm's Edit. of Gould's Mon. of Ramph., pl.

This species was first characterized by Mr. Waterhouse (from a specimen belonging to the late Earl of Derby) in 1839, four years subsequent to the completion of the first edition of this work, and during my absence in Australia; two years later Messrs. Sturm figured it in their edition of my Monograph under the name of *P. melanorhynchus*, both those gentlemen and Mr. Waterhouse having selected the black colouring of its bill, in which it differs from every known member of its family, for their specific appellation.

It is a typical example of that division of the family to which I have applied the generic term *Andigena*; it is, moreover, one of the most delicately coloured, and one of the most interesting species of the genus; from all of which, as above-mentioned, it differs in the black colouring of its bill, which is beautifully contrasted with the snowy whiteness of its throat; while the blue of its under surface is even more delicate than in *A. hypoglaucus*. It is a large and powerful bird, and the strength of its mandibles indicates that it can use them with greater force than any of its congeners.

Mr. Waterhouse has remarked that the nostrils do not extend so far forwards, that they are hidden by the feathers of the head, and that there is no longitudinal groove in front of them, as in other species of the genus.

Farther than its occurring in most of the recent collections sent from Santa Fé de Bogota, nothing is known respecting it; not even the localities it frequents in the great Andean Range. But little difference is observable in the colouring of the birds sent to Europe; on the other hand, they differ considerably in size, the smaller birds being probably females.

The figures are of the natural size.

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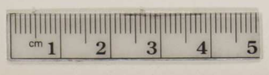
ANDIGENA BAILLONI.

Gould & Richter del et lith.
Hullmandel & Walton Imp.



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glossus, sp. 7.
——— *croceus*, Jard. & S

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The Plate represents the bird o

ANDIGENA BAILLONI.

Saffron-coloured Hill Toucan.

Specific Character.

And. fronte, genis, gulâ, corporeque subtus præter femora croceis; uropygio coccineo.

Front and sides of the head, cheeks, throat and under-surface saffron-yellow; upper surface, wings, tail, and thighs yellowish olive; rump crimson; on the sides of the mandibles immediately in front of the orbit a broad mark of red gradually decreasing to a point about the middle of the bill; above and below the red mark the mandibles are pale greenish blue; their apical halves are greenish horn-colour, fading into white on the serratures; orbits red; irides lemon-yellow; feet greyish green, with yellowish soles; nails black.

Total length, 15½ inches; *bill*, 3¼; *wing*, 5¼; *tail*, 7¼; *tarsi*, 1¼.

L'Araçari Baillon, Levaill. Hist. Nat. des Ois. de Parad., tom. ii. p. 44. pl. xviii.

Ramphastos Bailloni, Vieill. Nouv. Dict. d'Hist. Nat., tom. xxxiv. p. 283.—Ib. Ency. Méth. Orn., part iii. p. 1431.

Pteroglossus Bailloni, Wagl. Syst. Av., *Pteroglossus*, sp. 7.—Gould, Mon. of Ramph. pl. xx. —Gray and Mitch. Gen. of Birds, vol. ii. p. 403, *Pteroglossus*, sp. 10.—Bonap. Consp. Gen. Av., p. 94, *Pteroglossus*, sp. 11.—Less. Traité d'Orn., p. 176, *Pteroglossus*, sp. 7.

——— *croceus*, Jard. & Selb. Ill. Orn., vol. i. pl. vi.

Most of the travellers who have seen the members of this family in their native forests speak of the brilliancy of the colouring of their soft parts, not only of their orbits, bill and feet, but of the skin of various parts of their bodies, some being red, others blue, &c. As these colours fade immediately after death, the ornithologist of distant countries can have no idea, from the condition in which the specimens reach him, of the gay and brilliant hues which adorned them while living; and it is with no little study, research and trouble, that I have been enabled in this Second Edition to represent the denuded parts of these fine birds correctly. In no instance do these colours fade so entirely as in the species here represented; so great in fact is the difference of appearance between the living bird and the specimens in our Museums, that were we not aware of the changes that take place after death we should be very sceptical as to their being identical. The intensity of the colouring in the living bird also varies, being sometimes much greater than at others; this may be due to the peculiar state of the bird's health, but it is probable that it is most brilliant during the pairing and breeding-season. For a knowledge of the colouring of the soft parts of this species I am indebted to the kindness of the late Mr. John Natterer, who, when passing through London on his return to Vienna, after a residence of eighteen years in the Brazils, obligingly furnished me with drawings and full particulars as to the colouring of this and several other species of the Ramphastidæ.

As this bird is not characterized by the black head and throat and by the transverse bars on the breast, which are to be found in all the true *Pteroglossi*, and as its under surface is clothed with a hair-like plumage of a uniform tint like the members of the genus *Andigena*, I have, although it is a lowland species, considered its most natural situation to be in that division of the family. Its true habitat is the southern portion of Brazil, over which it is rather widely diffused: Mr. Natterer, who killed it on the high trees in the dense woods near Antonio Dias, on the 9th of November 1822, states that it was then beginning to moult, that it lives in pairs, and that the stomachs of those he examined contained berries.

Either the sexes differ very considerably in the form of the bill, or there exists two very distinct local varieties; some individuals having the bill narrow and attenuated, while in others it is short, deep and swollen. Could I detect any difference whatever in the colouring of the plumage, I should be inclined to regard them as two species, but at present must content myself with the remark above made, which will be sufficient to call the attention of naturalists and travellers, who may be visiting the native country of the bird, to the subject.

The Plate represents the bird of the natural size.

Ruchter, del et lith.
del & Walton, Imp.

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AULACORHAMPHUS SULCATUS.

Gould & Richter, del. et lith.
Hullmandel & Walton, Imp.

Aul. rostro atte
unicis; su
sanguineâ.

Upper surface
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mandible,
and lower
at the base
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Pteroglossus
vol. i. pl.
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Aulacoramphu

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AULACORAMPHUS SULCATUS.

Groove-bill.

Specific Character.

Aul. rostro attenuato ; mandibulis compressis, sulcatis, superioris sulcis utrinque duobus, inferioris unicis ; superiore nigrâ, culmine apiceque saturatè rufo-brunneâ ; inferiore nigrâ ad basin sanguineâ.

Upper surface dark grass-green ; under surface lighter yellowish green ; cheeks blue ; ear-coverts yellowish ; throat grey ; cheeks and narrow stripe over the eye blue ; primaries black, margined externally at the base with green ; upper portion of the sides of the upper mandible, and the apical part of the culmen chocolate-brown ; basal portion of the upper and lower mandible black, with the exception of the base, which is yellowish flesh-colour ; at the base of the mandibles a narrow thread-like line of white ; orbits brown ; feet dark green.

Total length, 13 inches ; *bill*, 3 ; *wing*, $4\frac{5}{8}$; *tail*, 5 ; *tarsi*, $1\frac{1}{4}$.

Pteroglossus sulcatus, Swains. in Journ. of Roy. Inst., vol. ix. p. 267.—Ib. Zool. Ill. 1st Ser., vol. i. pl. 44.—Temm. Pl. Col., pl. 356.—Gould's Mon. of Ramph., pl. 31.—Ib. Sturm's Edit., pl. .—Gray and Mitch. Gen. of Birds, vol. ii. p. 404, *Pteroglossus*, sp. 25.

Aulacoramphus sulcatus, Bonap. Consp. Gen. Av., p. 95, *Aulacoramphus*, sp. 1.

In the narrow and attenuated form of the bill, and the deeply grooved fissures on the sides of that organ, this species differs from all its congeners ; but it is more nearly allied to *A. Derbianus* than to any other. Its precise habitat is still unknown to me, but I believe it to frequent the country to the northward of the River Amazon, between Guiana and the Caraccas. Although not so rare as formerly, it is still wanting to many of the ornithological collections of Europe. The same paucity of information, which prevented me from giving any details as to its habits and economy in the former edition of this work, still exists. I have in my collection examples of what I believe to be both sexes of this bird ; and if this supposition be correct, the form and colouring of the bill, as well as the hue of the plumage, are precisely alike ; and the only difference is the somewhat smaller size of the female.

The figures are of the size of life.

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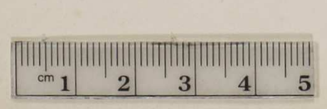
AULACORHAMPHUS DERBIANUS, *Gould.*

Gould & Richter, del et lith.
Hullmandel & Walton, Imp.



AULACORAMPHUS DERBIANUS.

The Earl of Derby's Groove-bill.

Specific Character.

Aul. rostro castaneo, anticè in brunnescenti-nigrum transeunte, ad basin fasciâ angustâ flavescenti-albidâ cincto; rectricum intermediarum duarum apicibus castaneis.

General plumage green, slightly tinged with brown on the upper surface of the body, strongly with blue on the back of the head, the nape and cheeks, and fading into white on the chin; primaries blackish brown; two middle tail-feathers largely tipped with chestnut; basal portion of both mandibles and the apex of the upper chestnut-red, the remainder of the bill black, with the exception of a narrow line of white, bordering the sides of both mandibles at the base; orbits lead-colour; irides yellow; legs and feet lead-colour.

Total length, 15 inches; *bill*, $3\frac{3}{8}$; *wing*, 5; *tail*, 5; *tarsi*, $1\frac{1}{2}$.

Aulacorhynchus Derbianus, Gould in Proc. of Zool. Soc., Part III. p. 49.

Pteroglossus Derbianus, Gould, Mon. of Ramph., pl. 32.—Ib. Sturm's Edit., pl. .—Gray and Mitch. Gen. of Birds, vol. ii. p. 404, *Pteroglossus*, sp. 27.

Aulacoramphus Derbyanus, Bonap. Consp. Gen. Av., p. 96, *Aulacoramphus*, sp. 5.

For the loan of the only examples of this fine species that have come under my notice, I am indebted to the kindness of the late Earl of Derby, whose valuable collection so often afforded me opportunity of examining rare and new species. In naming this new bird after His Lordship, I was desirous of paying a just tribute to one, who during a long life took the greatest interest in the promulgation of the natural sciences, particularly that of Ornithology, and of evincing my sense of the many favours he accorded to me.

In the former edition of this work I gave the Cordillerian Andes, in a wide sense, as the habitat of this species, but I have since ascertained that Dr. Poeppig of Leipsic found it in Peru, and Mr. Bridges in Bolivia, near the margins of the rapid mountain streams at Ronco, in the country of the Yuracuri Indians; consequently those countries are its true and native habitat. It is a very fine species, and possesses characters by which it may be readily distinguished from every other; it is most nearly allied to *A. sulcatus*, but is of a more robust form, has a stouter and less attenuated bill, the basal angle of which is not carried so far back as in that species, and has the two middle tail-feathers tipped with chestnut, a character never seen in *A. sulcatus*. The Messrs. Sturm inform us that Dr. Poeppig has given a full description of this bird in "Frorieps Notizen" (vol. xxxi. No. 21, or No. 681, Supplement), and that he there states its cry is loud and disagreeable; that it carries its tail erect with a bobbing motion, like that of the Wagtails, both while perched on the trees and when on the ground; that it lives in the woods, and is very rare. Messrs. Sturm add, that Dr. Poeppig had further informed them, that, like the *Pteroglossus Beauharnaisi*, it is a native of the Peruvian Andes, particularly the province of Huanuco, at an elevation of 8000 feet above the level of the sea; that, like its congeners, it deposits its eggs in hollow trees, and that they are of a shining whiteness, like those of the Kingfisher (*Alcedo Ispida*). We are further indebted to the Messrs. Sturm for a knowledge of the young bird, which differs considerably from the adult. The bill is shorter, the sulci but indistinctly and not deeply impressed, and the serratures entirely absent; the chestnut-red colouring of the bill is also more diffused, and is only observable on the middle of the culmen, being replaced by blackish brown on the tomiæ and under mandible; the line at the base of the mandibles is dirty white, instead of white, as in the adult; the colour of the plumage is similar, but lighter and less pure, especially on the under surface; the tail is remarkably different, all the feathers being very pointed, especially the middle ones, which have also a chestnut-brown spot very near to, but not quite at, the tip.

The figures are of the natural size.

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AULACORAMPHUS CASTANEORHYNCHUS. *Gould.*

Gould & Richter del. et lith.
Hullmandel & Walton, Imp.

AULACORAMPHUS CA

Chestnut-l

SPECI

Aul. rostro castaneo-rubro; mandibulâ in
latis; vittâ basali stramineâ; uropyg
tincto; caudæ rectricibus quatuor inte

Crown of the head and upper surface
four middle tail-feathers deep bluish
mainder green; all the under surface
chestnut-red, becoming paler towards
lower mandible and along the culme
of straw-white, which increases in br
Total length, 19 inches; *bill*, 4½; *wing*, 5

Pteroglossus (*Aulacorhynchus*) *castaneor*
p. 238.

Of the grass-green Toucans to which the ge
species is by far the largest yet discovered. T
own possession, which are somewhat smaller
Derby. The *Aulacorhynchus castaneorhynchus*
of the latter, together with the darker colou
stinctness.

The present species appears to be strictly
been sent to Europe in collections from Santa
respecting it.

The figures are of the natural size.

AULACORAMPHUS CASTANEORHYNCHUS, *Gould.*

Chestnut-billed Groove-bill.

Specific Character.

Aul. rostro castaneo-rubro; mandibulâ inferiore in medio, et culmine nisi ad basin nigro undulatis; vittâ basali stramineâ; uropygio coccineo; corpore subtùs viridi; pectore cæruleo tincto; caudæ rectricibus quatuor intermediis ad apicem latè castaneis.

Crown of the head and upper surface brownish green; wings dark green; rump crimson; four middle tail-feathers deep bluish green, largely tipped with chestnut-brown, the remainder green; all the under surface green, stained across the breast with light blue; bill chestnut-red, becoming paler towards the point, clouded with black on the middle of the lower mandible and along the culmen, except at the base: at the base of the bill is a band of straw-white, which increases in breadth as it proceeds downwards.

Total length, 19 inches; *bill*, $4\frac{1}{2}$; *wing*, $5\frac{3}{4}$; *tail*, $7\frac{1}{2}$; *tarsi*, $1\frac{3}{4}$.

Pteroglossus (*Aulacorhynchus*) *castaneorhynchus*, Gould in Ann. & Mag. of Nat. Hist., vol. ix. p. 238.

Of the grass-green Toucans to which the generic term of *Aulacorhynchus* has been applied, the present species is by far the largest yet discovered. The accompanying figures were drawn from specimens in my own possession, which are somewhat smaller than those in the fine collection formed by the late Earl of Derby. The *Aulacorhynchus castaneorhynchus* is nearly allied to *A. hæmatopygius*, but the diminutive size of the latter, together with the darker colouring of the apical half of its bill, indicates its specific distinctness.

The present species appears to be strictly an Andean species, all the specimens I have seen having been sent to Europe in collections from Santa Fé de Bogota. I regret to add that nothing more is known respecting it.

The figures are of the natural size.

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AULACORHAMPHUS HÆMATOPYGIUS, *Gould.*

Gould & Richter, del. et lith.
Hullmandel & Walton, Imp.

AULA

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Aulacoramphus

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AULACORAMPHUS HÆMATOPYGIUS, *Gould.*

Blood-rumped Groove-bill.

Specific Character.

Aul. rostro brevi, castaneo-rubro; mandibulâ inferiore in medio, et culmine nisi ad basin nigro undulatis; uropygio coccineo.

Crown of the head and upper surface brownish green; wings dark green; rump crimson; four middle tail-feathers deep bluish green, largely tipped with chestnut-brown, the remainder green; under surface green, faintly stained with blue down the sides of the neck and across the breast with light blue; bill chestnut-red, becoming paler towards the point, and clouded with black on the middle of the lower mandible and along the culmen; at the base of the bill a band of straw-white, which increases in breadth as it proceeds downwards.

Total length, 14 inches; *bill*, $2\frac{3}{4}$; *wing*, $4\frac{3}{4}$; *tail*, $5\frac{1}{4}$; *tarsi*, $1\frac{1}{2}$.

Pteroglossus hæmatopygus, Gould in Proc. of Zool. Soc., Part II. p. 147.—Gould, Mon. of Ramph., pl. 33.—Ib. Sturm's Edit., pl. .—Gray and Mitch. Gen. of Birds, vol. ii. p. 404, *Pteroglossus*, sp. 28.

Aulacoramphus hæmatopygus, Bonap. Consp. Gen. Av., p. 96, *Aulacoramphus*, sp. 6.

On reference to the edition of this work published in 1834, it will be seen that my figure of this species was taken from a specimen obligingly lent me by N. C. Strickland, Esq. It now forms part of my own collection; and on again comparing it after the lapse of twenty years with every other known species, I can come to no other conclusion than that it is quite distinct from the whole of them: the one to which it is most nearly allied is the *A. castaneorhynchus*, figured on the preceding Plate, but from which it differs in its much smaller size, and in its proportionally shorter and stouter bill; differences which perhaps may be considered trivial, but as they are found to exist in a specimen which is evidently adult, I cannot do otherwise than consider it distinct.

The native habitat of this bird is quite unknown to me—probably some portion of the Cordillerian Andes.

The figure is exactly of the natural size.

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AULACORAMPHUS CÆRULEICINCTUS. *D'Orb.*

Gould & Richter, del. et l
Hullmandel & Walton, Imp.

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Pteroglossus
M
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Aulacoramphu

Like *Aulacoramphu*
the eastern slopes
This species was
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been previously cal
preference.
The *Aulacoramp*
white throat, and
are contained in t
my own.
The figures are

AULACORAMPHUS CÆRULEICINCTUS.

Blue-banded Groove-bill.

Specific Character.

Aul. rostro plumbeo, apice tomiisque pallide corneis; uropygio sanguineo; mento, gulâ, genarum parte anticâ lineolâque supra oculos albidis.

Crown of the head, back, wings and tail dark grass-green; across the upper tail-coverts a broad patch of deep blood-red; four centre tail-feathers largely tipped with chestnut-brown; stripe over the eye, sides of the face and throat white washed posteriorly with blue; ear-coverts, chest and all the under surface yellowish green, deepening into rufous on the under tail-coverts; across the lower part of the chest a band of light blue; primaries black, margined externally with green; bill dark bluish lead-colour, becoming lighter towards the tip, which, as well as the serrations of both mandibles, are whitish horn-colour; feet lead-colour.

Total length, 15½ inches; *bill*, 3¾; *wing*, 5¾; *tail*, 6½; *tarsi*, 1½.

Pteroglossus cæruleicinctus, D'Orb. Voy. dans l'Amér. Mér. Ois., tab. 66. fig. 2.—Gray and Mitch. Gen. of Birds, vol. ii. p. 404, *Pteroglossus*, sp. 30.

——— *Lichtensteinii*, Sturm's Edit. of Gould's Mon. of Ramph.

Aulacoramphus cæruleicinctus, Bonap. Consp. Gen. Av., p. 96, *Aulacoramphus*, sp. 8.

Like *Aulacoramphus atrogularis*, this well-marked species is an inhabitant of the Cinchona woods, clothing the eastern slopes of the Peruvian Andes, where it is known to the Indians by the name of *Chukimbi*.

This species was named by the Messrs. Sturm *Pteroglossus Lichtensteinii*, in honour of my old and valued friend Dr. Lichtenstein, the Director of the Royal Museum in Berlin, and it would have given me very great pleasure to have retained this justly complimentary appellation for so fine a bird; but as I find that it had been previously called *cæruleicinctus* by M. D'Orbigny, the law of priority obliges me to give this name the preference.

The *Aulacoramphus cæruleicinctus* is rendered remarkable by the blue-grey colouring of its bill, by its white throat, and by the cærulean blue band crossing the chest. It is a very rare species, but specimens are contained in the Royal Museum at Berlin, in the Collection at the Jardin des Plantes at Paris, and in my own.

The figures are of the natural size.

21/-/-
Deaccessioned
, 1961
M.M.

AULACORHAMPHUS PRASINUS.

Gould & Richter, del et lit
Hullmandel & Walton Imp

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The Plate represents a

AULACORAMPHUS PRASINUS.

Golden-green Groove-bill.

Specific Character.

Aul. mandibulâ superiore flavâ, culminis strigâ, maculâ ante nares, lineâque ad tomium nigris; inferiore nigrâ; corpore superiore aureo-viridi.

Upper surface golden green, passing into blue on the extremities of the secondaries and the apical portion of the tail-feathers, of which the lateral ones are largely and the central ones slightly tipped with chestnut; primaries brownish black, margined at the base of the outer webs with green; throat and cheeks yellowish white; under surface light green, washed with blue on the breast and fading into white on the vent; under tail-coverts chestnut; upper mandible yellow, with a patch of black at the base of the culmen, passing anteriorly into chestnut-red; an oblong spot of black before the nostrils, and a streak of the same hue along the serratures, above which is a wash of green; under mandible black, with a narrow line of yellowish white at the base.

Total length, 14 inches; *bill*, $3\frac{1}{8}$; *wing*, $5\frac{1}{8}$; *tail*, 6; *tarsi*, $1\frac{1}{4}$.

Pteroglossus prasinus, Licht. in Mus. Berl.—Gould, Mon. of Ramph., pl. 29.—Ib. Sturm's Edit., pl. .—Gray and Mitch. Gen. of Birds, vol. ii. p. 404, *Pteroglossus*, sp. 13.
Aulacoramphus prasinus, Bonap. Consp. Gen. Av., p. 96, *Aulacoramphus*, sp. 4.

Although by far the greater number of the *Aulacoramphi* are inhabitants of the great continent of South America proper, yet we have positive proofs that two species at least are found to the northward of the isthmus; namely the beautiful *A. cæruleogularis*, which is a native of Veragua and doubtless of Costa Rica, and the *A. prasinus*, which inhabits Guatemala and the southern provinces of Mexico generally: to these districts they would seem to be confined, and I believe that they never pass to the southward of Panama: a circumstance which tends to support such an opinion, is, that the countries to the north and south of this neutral ground have each a peculiar fauna of their own; more in regard to species, however, than to diversity of form. When I figured this species, twenty years ago, it was very rare; it is now to be met with in many collections; in my own there are four or five examples, some of which were procured by that indefatigable traveller M. Delattre, while the others were presented to me by my valued friend and correspondent M. Floresi.

Of the habits and economy of the Golden-green Groove-bill, as distinguished in the minuter details from those of the other species of the genus, I have no information to communicate: the sexes present the usual similarity of appearance; on the other hand, in the young bird, as will be seen in the accompanying Plate, a marked difference occurs, not only in the size, but in the colouring of its bill, during its progress from youth to maturity,—a feature not peculiar to this species alone, but characteristic of the whole family: the development of the beak, also, is much more gradual than that of the rest of the body; for when the latter has acquired its complete dimensions, the former is little more than half the size it is afterwards to attain.

The Plate represents a male, a female, and the heads of two young birds, of the natural size.

21/-/-
11, 1961
R.M.M

AULACORAMPHUS WAGLERI.

Gould & Richter, del et lith
Hullmandel & Walton, Imp

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AULACORAMPHUS WAGLERI.

Wagler's Groove-bill.

Specific Character.

Aul. rostro nigro, ad basin lineâ aurantiaco-flavâ, circumdato, lateribus (nisi basin versus) flavis supernè in cœruleo-viridem transeuntibus infra lineâ nigrâ a tomio sejunctis.

General plumage deep green, with a wash of blue on the tips of the secondaries; primaries black, edged with green; tail deep green, passing into blue near the extremity and largely tipped with rich chestnut; the portion of the cheeks immediately behind the bill and the throat white, with a slight wash of blue where it meets the green of the neck and chest; under tail-coverts chestnut; base of the culmen, a large nearly triangular patch in the lower angle of the upper mandible, and a line along the denticulations black; remainder of the upper mandible rich yellow, with a line of pale green along the lower edge of the yellow separating it from the black of the denticulations; under mandible entirely black, both mandibles bounded at the base by a somewhat broad raised band of orange-yellow; irides orange; orbits deep rose-red; legs and feet leaden-blue.

Total length, 14 inches; *bill*, $3\frac{3}{8}$; *wing*, $5\frac{1}{4}$; *tail*, $5\frac{1}{2}$; *tarsi*, $1\frac{3}{8}$.

Pteroglossus pavoninus, in Royal Mus. of Munich.—Gould in Proc. of Zool. Soc., Part III. p. 158.—Ib. Mon. Ramph. pl. 30.—Gray and Mitch. Gen. of Birds, vol. ii. p. 404, *Pteroglossus*, sp. 26.

Pteroglossus Wagleri, Sturm's Edit. of Gould's Mon. of Ramph., pl. .

Aulacoramphus pavoninus, Bonap. Consp. Gen. Av., p. 95, *Aulacoramphus*, sp. 2.

The *Pteroglossus Sturmi* being unique in the Imperial Museum of Vienna, and the *Aulacoramphus Wagleri* in the Royal Museum of Munich, I was under the necessity of visiting both those cities for the purpose of obtaining drawings for the present work; the information I procured respecting these Toucans twenty years ago was but meagre, nor has our knowledge been increased in the interval. Considerable confusion exists as to the name of the present species; it has generally been known as the *Pteroglossus pavoninus* of Wagler, but the Messrs. Sturm state that Wagler gave that name in mistake to an example of the bird previously named *prasinus* by Dr. Lichtenstein, and add that two other species had also been confounded under the same appellation; they also remark that the name is singularly inappropriate, inasmuch as there is nothing in the appearance or colouring of the bird to remind us of a Peacock; and moreover state their belief, that the name had in the first instance been applied to a made-up specimen which had had some feathers inserted, thus giving rise to a false impression; under these circumstances they have discarded the name altogether and proposed that of *Wagleri*, as a just compliment to their friend Dr. Wagler, who had done so much for the science of ornithology, and whose untimely death by the accidental discharge of a gun during a shooting excursion, deprived natural history of the service of one of her most talented and enthusiastic professors.

The *Aulacoramphus Wagleri* is said to be a native of Mexico. It is very nearly allied to the *Aulacoramphus prasinus*, but may be distinguished from that species by its more attenuated bill, by the greater breadth and more orange hue of the raised band at its base, and by the large amount of black near the base of the upper mandible.

The figure is of the size of life.

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RMM

AULACORAMPHUS ALBIVITTA.

Gould & Richter del et lit
Hullmandel & Walton Imp.

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AULACORHAMPHUS ALBIVITTA.

White-banded Groove-bill.

Specific Character.

Aul. rostro nigro, ad basin fasciâ albâ circumdato; culmine toto ad apicem usque laterumque mandibulæ superioris partes, citreis in viridiscentem transeuntibus; mandibulâ inferiore ante fasciam albam maculâ sanguineâ notatâ; gulâ albidâ.

All the upper surface and wings dark tinged with brown; on the crown and the nape of the neck grass-green; primaries brownish black, margined externally at the base with dark grass-green; tail deep grass-green, passing into blue towards the extremity, and tipped with rich chestnut; throat white in some, grey or bluish white in others; under surface pale grass-green, very slightly washed with blue on the breast, and with yellow on the flanks; around the orbits and down the sides of the neck bounding the white of the grey throat a line of blue; under tail-coverts rich deep chestnut; bill black, with the exception of the culmen and upper half of the upper mandible, which are greenish yellow, passing into purer yellow at the tip and the lower angle of the under mandible which is chestnut; on the sides of both mandibles at the base a broad band of straw-white; orbits red; feet greenish lead-colour.

Male.—Total length, $13\frac{1}{4}$ inches; *bill*, $3\frac{1}{8}$; *wing*, $4\frac{3}{4}$; *tail*, $5\frac{1}{4}$; *tarsi*, $1\frac{1}{8}$.

Pteroglossus albivitta, Boiss. Rev. Zool. 1840, p. 70.—Sturm's Edit. of Gould's Mon. of Ramph. text.
——— *albivittatus*, Gray and Mitch. Gen. of Birds, vol. ii. p. 404, *Pteroglossus*, sp. 31.
——— *microrhynchus*, Sturm's Edit. of Gould's Mon. of Ramph.
Aulacoramphus albivitta, Bonap. Consp. Gen. Av., p. 96, *Aulacoramphus*, sp. 3.

This is one of the least of the family of Ramphastidæ yet discovered. It is a native of the Columbian Andes, and specimens occur in most of the collections sent from thence to this country. It differs from the *Pteroglossus prasinus* of Lichtenstein, to which it is nearly allied, in having a broad band of white down the sides of the base of the mandibles.

Considerable difference occurs in the size of the specimens, which is perhaps due to sex, the larger being the males, and the smaller the females.

The figures are of the natural size.

£ 21/-/-
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AULACORAMPHUS ATROGULARIS.

Gould & Richter, del. et
Hullmandel & Walton, lit.

AULACOR

Aul. gulâ genarumque parte viridi, dein in cærulesc terminatis.

General plumage yellowish throat and a small pa primaries brownish bl only of the external w of the succeeding feat near the tip; under ta yellow, with a narrow near the cutting edge, raised ridge at the ba which is yellow; the are also white; feet g

Male.—Total length, 15 i

Female.—Total length, 13

Pteroglossus atrogularis Mitch. Ge

Aulacoramphus atrigula

The woods bordering the ea this fine species, which dif strongly contrasted marking form part of the Royal Mus in the collection of Prince M cimens from which my figu his researches in Peru.

The figures are of the nat

AULACORAMPHUS ATROGULARIS.

Black-throated Groove-bill.

Specific Character.

Aul. gulâ genarumque parte anticâ anthracinis; crisso cinnamomeo; caudâ supra basin obscuro-viridi, dein in cærulescentem transeunte; rectricibus octo intermediis maculâ cinnamomeâ terminatis.

General plumage yellowish green, becoming of a somewhat lighter hue on the under surface; throat and a small patch beneath the eye deep black, margined posteriorly with blue; primaries brownish black, margined externally with green, the green occupying the base only of the external web of the outer feather, and gradually increasing in extent on each of the succeeding feathers as they approach the body; green of the tail passing into blue near the tip; under tail-coverts and the tips of the tail-feathers chestnut; upper mandible yellow, with a narrow line of black across the base, and another narrow line of black near the cutting edge, the two lines united near the gape by a triangular mark of black; raised ridge at the base of upper mandible yellow; under mandible black, except at point, which is yellow; the raised ridge at its base white; the cutting edges of both mandibles are also white; feet greenish lead-colour.

Male.—Total length, 15 inches; *bill*, $3\frac{1}{4}$; *wing*, 5; *tail*, $5\frac{1}{2}$; *tarsi*, $1\frac{1}{4}$.

Female.—Total length, 13 inches; *bill*, $2\frac{5}{8}$; *wing*, $4\frac{3}{4}$; *tail*, 5; *tarsi*, $1\frac{1}{4}$.

Pteroglossus atrogularis, Sturm's Edit. of Gould's Mon. of Ramph. p. . pl. .—Gray and Mitch. Gen. of Birds, vol. ii. p. 404, *Pteroglossus*, sp. 29.

Aulacoramphus atrigularis, Bonap. Consp. Gen. Av., p. 96, *Aulacoramphus*, sp. 7.

The woods bordering the eastern sides of the Andes in Peru and Ecuador are the localities inhabited by this fine species, which differs from all its congeners in the black colouring of its throat and in the strongly contrasted markings of its bill. It is a rare bird in the collections of Europe; but fine examples form part of the Royal Museum at Berlin, and in that of the late Earl of Derby; and were also contained in the collection of Prince Massena at Paris, now removed to Philadelphia in North America. The specimens from which my figures were taken were procured by the celebrated traveller Dr. Tschudi during his researches in Peru.

The figures are of the natural size.

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AULACORHAMPHUS CÆRULEOGULARIS, *Gould*

Gould & Richter del. et lith.
Hullmandel & Walton, imp.

AULACORA

Aul. gulâ cœruleâ.

Upper surface dark green
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Aulacoramphus cœruleogu

The new species of Groove-Bi
Naturalist to H.M.S. Herald,
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AULACORAMPHUS CÆRULEOGULARIS, *Gould.*

Blue-throated Groove-bill.

Specific Character.

Aul. gulâ cæruleâ.

Upper surface dark green, with an olive tint on the head and nape, and of a brighter green on the rump and upper tail-coverts; primaries blackish brown, margined externally at the base with dark green; tail deep green, passing into blue towards the extremity, and tipped with rich chestnut; throat and fore part of the cheeks cærulean blue; under surface green, washed with yellow on the flanks and abdomen; under tail-coverts rich chestnut; bill black, with the exception of the upper part of the sides of the upper mandible and the apical portion of the culmen, which are greenish yellow, passing into purer yellow at the tip; on the sides of both mandibles at the base a broad band, which on the upper one is yellow, and on the lower white; orbits red; legs and feet greenish lead-colour.

Total length, $12\frac{1}{4}$ inches; *bill*, $2\frac{7}{8}$; *wing*, $4\frac{1}{2}$; *tail*, $4\frac{3}{4}$; *tarsi*, $1\frac{1}{4}$.

Aulacoramphus cæruleogularis, Gould in Proc. of Zool. Soc., February 22, 1853.

The new species of Groove-Bill figured on the accompanying Plate was killed by Berthold Seemann, Esq., Naturalist to H.M.S. Herald, together with other ornithological rarities, in Veragua. It is very nearly allied to *A. albivitta*; but may be at once distinguished from that species by its rich blue throat, by the band at the base of the bill being much broader and yellow on the upper mandible, instead of white, and by the under surface being washed with yellow, while in the other it is pure green. I regard the discovery of this new species with the greatest interest, as an important addition to the present group, especially as it arrived at an opportune moment for including it in the present Monograph.

The figures are of the natural size.

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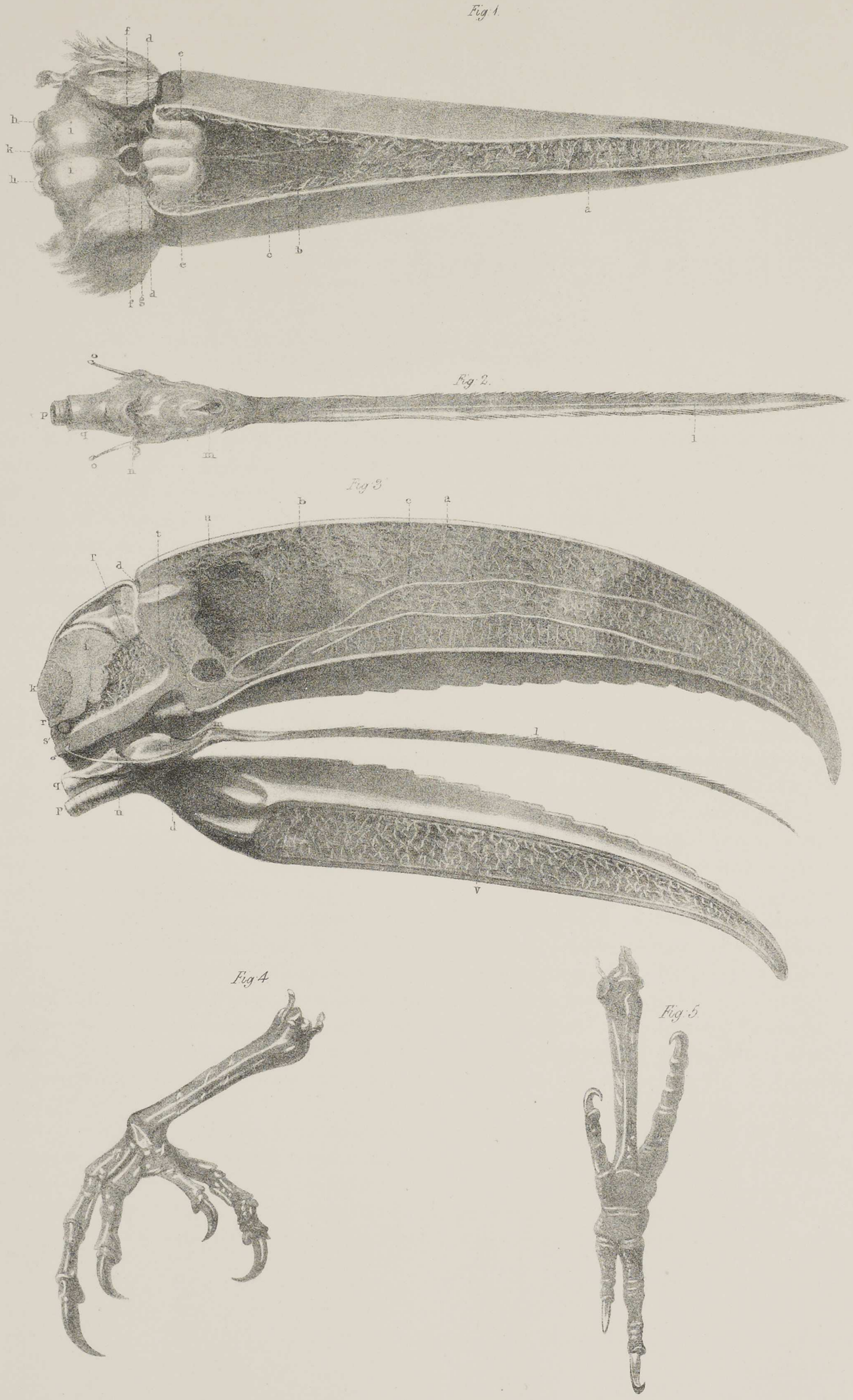
michael s. wittich
oct 21, 1961
the RMM



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Printed by C. Hullmandel.

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OBSERVATIONS

ON

THE ANATOMY OF THE TOUCAN.

THE organs of digestion in the Toucan present a general simplicity of structure, which accords with its geographical position and power of assimilating both animal and vegetable food, so abundantly provided by Nature in a tropical climate. The amplitude of the œsophagus and general width of the intestinal canal correspond to the magnitude of the beak. There is no lateral dilatation or crop, nor is the gizzard so encroached upon by its muscular parietes as to render such a reservoir for the alimentary substances necessary. The intestinal canal is equally devoid of lateral pouches, or *cæca*: the gastric glands are of a simple form, and are disposed, for the extent of an inch, around the termination of the œsophagus. The communication of the gizzard with the *proventriculus* is free, and readily permits regurgitation to take place. This act has been observed in two living species of Toucan (*Ramphastos Erythrorhynchus* and *Ramph. Ariel*, Vigors); and as the substances so regurgitated were, after undergoing a second mastication, again swallowed, it may be compared to the rumination of herbivorous quadrupeds.

The intestinal canal does not exceed the length of the body, including the bill. The general structure of the digestive apparatus of the Hornbill agrees with that of the Toucan.

The liver of the Toucan is composed of two lobes, of unequal size, joined by a small band, the margins of the lobes being more rounded than usual. There is no gall-bladder, and in this deficiency the Toucan manifests an affinity to the *Picidæ* and *Psittacidæ*, among the *Scansores*; while the Hornbill, on the contrary, resembles the *Corvidæ* in the large development of its biliary receptacle. A small hepatic duct enters the duodenum near its commencement; and a second duct, about two lines in diameter, passes to a more distant part of the intestine, where it terminates close to the insertion of the two pancreatic ducts.

The kidneys are composed of three lobes, of which the middle one is the smallest; their length is $1\frac{1}{2}$ inch; their surface is convoluted, though in a less marked degree than in reptiles. Between the anterior extremities of these glands, in a female specimen of *Ramphastos Ariel*, was situated the ovary, of a triangular shape, and apparently healthy in structure. The *ova* were like minute granules, and disposed in a convoluted manner. The supra-renal glands were imbedded in the posterior part of the ovary. The oviduct was as large as a crow-quill; it commenced by the usual fimbriated and wide aperture, was slightly tortuous at the commencement, and then continued straight to the *cloaca*.

Among the varied forms of tongue which birds present, that of the Toucan is one of the most remarkable. Its length from the aperture of the *glottis*, in a full-grown *Ramphastos Toco*, was six inches. The posterior ridge, or backward-projecting process, was broad and finely notched; it was situated about 4 lines from the *glottis*. Anterior to this process the tongue is soft and minutely papillose for the extent of 4 lines, and here, most probably, the sense of taste resides: the rest of the organ consists of a transparent horny *lamina*,

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flattened horizontally and supported by the anterior process of the *os hyoides*, which forms a ridge along the middle of its inferior surface. At about four inches from the extremity of the horny *lamina* the margins become obliquely notched, and these notches, becoming deeper and closer together towards the extremity, occasion the bristled appearance on each side of the tongue. These bristles, Mr. Vigors observes, were generally applied to the morsels of food whilst held between the mandibles previously to being swallowed.

The *cornua* of the *os hyoides* are $1\frac{1}{2}$ inch in length. The *trachea* is narrow, and simple in its structure, the rings somewhat flattened and decreasing in diameter towards the inferior extremity, from which a single pair of muscles pass off to the *sternum*. The length of the lower fourth of the tube, and the state of tension in the *bronchia*, are regulated by a pair of small muscles, which, arising from the sides of the tracheal cartilages, are inserted into the bone of divarication at the extremity of the *trachea*: and that this part of the tube is subjected to variations in length is indicated by the tortuous character of the recurrent nerves attached to the sides of the *trachea* at this part. The lungs are small in proportion to the size of the bird, but of the usual form and structure. The abdominal air-cells are of small size. The heart is of a more oblong form than in general; its *apex*, as it were, truncate; its length 1 inch.

The pectoral muscles, as in the *Psittacidæ*, are but feebly developed, and the keel of the *sternum* is of moderate size, not projecting more than half an inch from the plane of the bone. The *sternum* has four notches at its posterior margin. The clavicles, or lateral halves of the *furcula*, are here, as in the *Psittacidæ* and *Struthionidæ*, separate; they are 1 inch in length, slender, pointed at their lower ends, and joined to each other and to the *sternum* by ligament only.

The peculiar motions of the tail called for a particular examination of that part. It is difficult to state the precise number of the caudal *vertebræ* in consequence of the terminal ones being anchylosed, requiring for this purpose the examination of a young specimen at a period before the *anchylosis* takes place. In the skeleton of a Black-billed Toucan which I have examined, it would appear that three *vertebræ* are thus anchylosed, making the entire number of coccygeal *vertebræ* nine. The Woodpecker has also nine caudal *vertebræ*, and this seems to be the greatest number found in birds. The first six of these *vertebræ* in the Toucan are articulated by ball-and-socket joints, the ball and the socket being most distinct in the last two joints. That between the sixth and the anchylosed *vertebræ* is provided with a capsule and synovial fluid; the others have a yielding ligamentous mode of connexion. The spinous processes of these *vertebræ*, both superior and inferior, are of moderate size, but smallest in the sixth, where the greatest degree of motion takes place. The transverse processes, on the contrary, are large and broad, so as almost wholly to prevent lateral motion. The first of the anchylosed *vertebræ* is broad and flat and of a rounded form, supporting the two coccygeal glands: the last of these processes is compressed laterally, and of the ordinary ploughshare form. The caudal *vertebræ* can be inflected dorsad till their superior spines are brought into contact with the *sacrum*; in the opposite direction they can scarcely be bent beyond a straight line: and it is to this structure of the bones and joints that is to be attributed the capability in the Toucan of turning its tail upon its back (as represented in the Zoological Journal, vol. ii. pl. xv.), the muscles presenting comparatively few peculiarities, since the motion alluded to is remarkable rather for its extent than the vigour with which it is performed.

The principal *elevators* of the tail are the *sacro-coccygei superiores* (*sacro-sus-caudiens* of Vicq d'Azyr). They arise from two longitudinal ridges on the inferior and convex part of the *sacrum*, and are inserted into the superior spines of the first six *vertebræ* by detached tendons, terminating broadly in the anchylosed *vertebræ*. The principal antagonists of these muscles, *sacro-coccygei inferiores* (*sacro-sous-caudiens* of Vicq d'Azyr), pass over the first five *vertebræ* and terminate in the sixth and anchylosed *vertebræ*: their origins are wider apart than in the preceding pair of muscles, coming off from the margins of the sacro-sciatic notches. In the interval are situated small muscles passing from the transverse processes to the inferior spines of the first six *vertebræ*.

From the limited nature of the lateral motions of the tail the muscles appropriate to these movements are feeble, especially in comparison with those which are observed in the birds that spread their tail-feathers

in flight, in order to regulate their course during that vigorous species of locomotion. These muscles are in number two on each side, arising from the posterior extremities of the *ischia*, and inserted into the expanded anchylosed *vertebræ*. From the disposition of these muscles it is obvious that after the proper *elevators* have raised the tail to a certain height, they also become dorsad of the centre of motion, combine their forces with the *elevators*, and by this addition of power terminate the act of throwing up the tail by a jerk: Mr. Vigors in his observations on the living animal observes, that "in these movements the tail seemed to turn as if on a hinge that was operated on by a spring."

The osseous portions of the mandibles of the Toucan are disposed in a manner adapted to combine with the great bulk of those parts a due degree of strength and remarkable lightness, and the bony structure is consequently of a most beautiful and delicate kind. The external parietes are extremely thin, especially in the upper beak: they are elastic, and yield in a slight degree to moderate pressure, but present considerable resistance if a force is applied for the purpose of crushing the beak. At the points of the mandibles, the outer walls are nearly a line in thickness; at other parts, in the upper beak, they are much thinner, varying from 1-30th to 1-50th part of an inch, and in the lower beak are from 1-20th to 1-30th of an inch in thickness.

On making a longitudinal section of the upper mandible, its base is seen to include a conical cavity, about two inches in length and one inch in diameter, with the apex directed forwards. The walls of this cone consist of a most beautiful osseous network, intercepting irregular angular spaces, varying in diameter from half a line to two lines. From the parietes of this cone, a network of bony fibres is continued to the outer parietes of the mandible, the fibres which immediately support the latter being almost invariably implanted at right angles to the part in which they are inserted.

The whole of the mandible anterior to the cone is occupied with a similar network, the meshes of which are largest in the centre of the beak in consequence of the union which takes place between different small fibres as they pass from the circumference inwards. It is remarkable that the principle of the cylinder is introduced into this elaborate structure: the smallest of the supporting pillars of the mandibles are seen to be hollow or tubular, when examined with the microscope. The structure is the same in the lower mandible, but the fibres composing the network are in general stronger than those of the upper mandible.

The medullary membrane lining these cavities appears to have but a small degree of vascularity. Processes of the membrane, accompanying vessels and nerves, decussate the conical cavity at the base of the beak. The principal nerves are two branches of the fifth pair, which enter at the lower part of the conical cavity, and diverge and ascend as they pass forwards to the end of the bill, giving off branches, which are distributed to the horny covering, and supply it with sensibility.

The air is admitted to the interior of the upper mandible from a cavity situated anterior to the orbit, which communicates at its posterior part with the air-cell continued into the orbit, and at its anterior part with the maxillary cavity. The nasal cavity is closed at every part, except at its external and internal apertures, by the pituitary membrane, and has no communication with the interior of the mandible.

The organ of smell is confined to the base of the upper jaw. The canal, which is traversed by the air and odorous particles in inspiration, forms a sigmoid curve in the vertical direction. The external orifice is on precisely the same perpendicular line as the internal one. It is situated at the posterior surface of the upper mandible, where it is raised above the level of the cranium; the orifice is consequently directed backwards, secure from all injury that might happen to it in the act of penetrating dense or interwoven foliage.

The olfactory canal is at first of almost a cylindrical form, and about two lines in diameter. It passes forwards for about half an inch, receiving from the mesial aspect the projection of the first spongy bone; it then bends downwards and backwards, and is dilated to admit the projections of the two other spongy bones: from this point it descends vertically to the palate, at first contracted, and afterwards dilating to form the internal or posterior orifice. The first or outermost spongy bone is almost horizontal, and has its convexity

directed outwards. The second is nearly vertically placed, with its convexity directed backwards: it terminates in a narrow point below. The third or superior spongy bone makes a small projection towards the mesial plane, about the size of a pea. These spongy bones are formed by inward projections of the inner and posterior osseous parietes of the nasal passage; they are cellular, and air is continued into them from the cranial diploë; but the parietes of the nasal passage are entire and smooth, and lined by a delicate pituitary membrane. The inner table of the skull is continuous with the parietes of the nasal cavity, by means of the bony canal which accompanies and protects the olfactory nerves, and which represents, as it were, a single foramen of the cribriform plate of the mammalia. The communication of the cavity of the cranium with that of the nose is thus similarly formed, and is only obstructed in the recent state by the pituitary membrane, on the posterior *cul de sac* of which the olfactory nerve distributes its branches in a radiated manner. These branches were confined, as Scarpa has observed in other birds, to the pituitary membrane covering the septum narium and the superior spongy bone.

The external orifice of the meatus auditorius is situated about half an inch behind the lower boundary of the orbit. The membrana tympani closes it so obliquely that its plane is directed almost backwards; its anterior edge is consequently about three lines from the external orifice, while its posterior margin is at least six lines from the same point. It is convex outwardly as in birds generally. The apparatus of the internal ear is easily exposed, the semicircular canals being lodged in a delicate reticulation of the diploë of the cranium. These parts, with the ossiculum of communication and the cochlea, do not present any deviations from the ordinary structure worthy of notice.—R. O.

DESCRIPTION OF THE PLATE.

Fig. 1. Section of the cranium and upper mandible of the *Rhamphastos Toco.*
- *a.* The cancellated structure of the beak.
- *b.* The cavity at the base.
- *c.* Branches of the fifth pair of nerves.
- *d d.* The external orifices of the nostrils.
- *e.* The osseous parietes of the nasal passages.
- *f.* The osseous tubes protecting the olfactory nerves.
- *g.* The pituitary membrane exposed, and branches of the olfactory nerve radiating upon it.
- *h.* The superior semicircular canals of the internal ear.
- *i i.* Hemispheres of the cerebrum.
- *k.* Cerebellum.

Fig. 2. The upper surface of the tongue.
- *l.* The fringed or feathered portion of the tongue.
- *m.* The orifice of the larynx.
- *n.* The orifice of the pharynx.
- *o o.* Cornua of the os hyoides (*cerato-hyal* bones of Geoffroy).
- *p.* The trachea, or windpipe.
- *q.* The gullet.

Fig. 3. Vertical longitudinal section of the head.
The same letters indicate the same parts as in the previous figures.
- *d.* Shows the internal aperture of the nostrils.
- *r.* The beginning of the spinal chord.
- *s.* The articulating surface of the occipital bone.
- *t.* The nasal septum or partition.
- *u.* The air-cell anterior to the orbit from which the air passes into the mandible.
- *v.* The cancellated structure of the lower jaw.

Fig. 4. Side view of the foot of *Ramphastos Toco.*

Fig. 5. Under surface of the same.

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